Frozen Landscapes, Dynamic Skills: An Ethnoarchaeological Study of Inuit Kayaking Enskilment and the Perception of the Environment in Greenland

by

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A thesis submitted in conformity with the requirements for the degree of Doctor of Philosophy
Department of Anthropology
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Abstract

Keywords: Arctic Archaeology; Communities of Practice; Enskilment; Archaeology of Learning; Situated Cognition; Technology and the Environment

This dissertation is an ethnoarchaeological study of kayaking, a skill that has been practiced by Inuit in the Eastern Arctic since the first Thule migrants explored and settled the region around 1250 A.D. In this project, I aim to better understand the archaeological record of Inuit culture by working closely with a community in Greenland that builds kayaks and practices traditional hunting skills. Although kayaking is no longer a primary mode of subsistence, the community finds meaning in the persistence of the skill because it is an important mechanism of intergenerational experience, and because it contains types of cultural and environmental knowledge that can only exist through practice. The community is specifically focused on the physicality of enskilment—the process through which individuals develop unique capacities for awareness and response through environmentally situated practice. Through enskilment, kayakers attune their senses to subtleties and nuances of the environment which would not otherwise be apparent, and they embody a heritage of resilience and creative responsiveness in both the natural and social environment. Drawing on three field seasons of ethnoarchaeological
fieldwork, I document the process through which individuals become skilled kayakers and explore the constitution of the kayaking community through practice. As demonstrated in this dissertation, the acquisition of skill in kayaking is not a passive process where knowledge is simply handed from one generation to the other. This is an important observation for archaeologists who study the past through the interpretation of material culture. It will be argued that understanding the impermanence and inherent creativity through which environmentally situated knowledge is re-grown in the experiences of each generation allows for more nuanced archaeological narratives which emphasize skilled practice on the part individuals as causative agents at work in the deeper history of Inuit culture.
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Chapter 1
Enskilment and Ethnoarchaeology in Greenland

1.1 Introduction

This dissertation is an ethnoarchaeological study of kayaking – a skill that has been practiced by Inuit in the Eastern Arctic since the first Thule migrants explored and settled the region around 1250 A.D. (Friesen & Arnold 2008; Whitridge 1999). In this project, I have been working closely with a community in Greenland that builds kayaks and practices traditional hunting skills as a means of exploring Inuit heritage. Over the last 35 years, Greenland has been moving towards independence from Denmark, resulting in the 2009 transition to Selvstyre, (Self-Rule Governance). As a newly formed Arctic country, Greenland faces many economic and cultural challenges, and with an environment that is rapidly changing, there are many questions about the shape of Greenland's future. Heritage has been a topic at the forefront of Greenlandic politics in terms of defining an Inuit concept of modernity that adapts the experiences and knowledge developed through generations of hunting life to the present (Graugaard 2009; Nuttall 2010; Pedersen 2009). Although kayaking is no longer a primary means of subsistence, the community finds meaning in the persistence of the skill because it is an important mechanism of intergenerational experience, and because it contains types of cultural knowledge that can only exist through practice.

The modern kayaking community is specifically focused on the physicality of enskilment as a transformational process that characterizes the manner through which Inuit experience and come to perceive their surroundings. Through enskilment, kayakers attune their senses to subtleties of the environment that would not otherwise be apparent. I am interested in the relevance of traditional kayaking in modern Greenland to the interpretation of the archaeological record, and my research seeks to answer the question "what role does kayaking play in long term processes that shape the deeper history of Inuit culture?" I conducted three field seasons of ethnoarchaeological work in the communities of Ilulissat, Sisimiut and Nuuk during the summers of 2009, 2010 & 2011. The fieldwork was a collaborative partnership with the community; through a combination of participant observation and interviews we documented the history of the modern community, and mapped out the process through which individuals become skilled kayakers, specifically looking at how the enskilment situates Inuit society in the environment.
1.1.1 Throwing a Harpoon: An Episode of Enskilment

To introduce the project, and to demonstrate what is meant by ‘knowledge that can exist only through environmentally situated practice’, it is useful to draw on a typical scene from my fieldwork. One evening in 2010, a local kayaker was teaching two young boys how to throw the *mamagoq* (a practice harpoon) from their newly built kayaks. It was one of their first attempts, and at ages 10 and 11, they are just beginning to learn the skills of kayaking. Neither of them can roll if they capsize, so they have to practice in a small harbour where they can be easily rescued. I was able to film the episode from the shore. The teacher starts the session by demonstrating the technique for them. At age 24, he is himself still learning, but he is at a stage where he can help beginners. Imagining that he is stalking a seal, the teacher aims his kayak at a buoy shaped to act as a floating target; he carefully paddles a few silent strokes, and then lets the kayak glide forward, cutting a straight line across the still water. His form is fluid, well practiced and attentive – his concentration is not hindered by a lack of skill, and his senses are attuned to the immediate environment. He can feel where the harpoon lies on the deck, and without taking his eyes off the target, he readies it so that he is poised to throw it with the *norsaq* (throwing board). At a distance of about 10m, he throws the harpoon using his whole body – the force and angle of the throw is well coordinated and he scores a direct hit. It looks easy, but the years of practice that it took to develop and polish the skill are immediately exposed by watching the two boys attempt to mimic him.

The teacher deliberately brought only one harpoon, so the two boys have to trade off between throws, watching each other as they practice. They are much clumsier – with every movement, they are encumbered by their lack of skill. It seems difficult for them to concentrate on so many things at once, and even reaching for the harpoon while still holding the paddle.
Figure 1 Learning to throw the harpoon. 1) Demonstrating aspects of technique 2-4) Sequence depicts a failed attempt to throwing the harpoon – in this case, the *mamagoq* harpoon didn't release from the *norsaq* throwing board.

brings them precariously close to tipping over. When they do manage to cast the harpoon, their throwing arms seem awkwardly independent of the rest of their body, and they have no range or accuracy whatsoever. Over the hour that they practice, the teacher is patiently on hand to help by directing their attention to flaws in technique and to potentially rescue them if they lose their balance (Figure 1). By competing with each other, they are emotionally invested in their success, but although the two boys try very hard, it is difficult to tell if they improve much. Even watching from the shore, it is obvious to me that it takes years of practice to develop the skills of kayaking.

In this brief episode, there are several observations that can be identified about the nature of the skills involved in kayaking, which form the basis of the research question for this thesis.
Kayaking clearly involves knowledge that is kinaesthetic in nature – it is related to the coordination of action through movement, and is dependent on sensorimotor abilities such as motor-memory (Cox 2011; Gardner 1999; Marchard 2008; Wendrich 2012:13). The skill also requires a high degree of responsiveness – the creative coupling of perception and action (Ingold 2011:58). In drawing and throwing the harpoon, kayakers have to coordinate their action in an environment that perpetually changes as the kayak moves in relation to the target, and they must adjust and compensate their balance throughout the motion. Even in the safety of the harbour, no two attempts at harpooning are exactly the same, and a successful throw is the result of skilful responsiveness on the part of the kayaker to situational contingencies. If the two boys develop their skill enough to go out into the ocean, or perhaps even try hunting seals, they will have to be ready to predict, sense, and react to many complex environmental contingencies, such as the swell of waves, changes in the weather, differential wind, and the movements and behaviour of animals. These types of knowledge seem to be difficult to 'transmit'; an experience kayaker can help to guide the learning process by directing attention to specific aspects of practice, but no amount of verbal instruction, or even demonstration can 'install' the ability in a learner.

Becoming a kayaker is a process of enskilment – the personal development of capacities for awareness and response through environmentally situated practice (Ingold 2000:5; Palsson 1994). Enskilment in kayaking is not a question of embodying a stock of theoretical knowledge – it is the developed capacity to sense and creatively engage with the flow of environmental impermanence.

The physical aspect of this process of enskilment is where the modern kayaking community finds meaning in ensuring the practice persists in the present. The skills of kayaking were developed through the personal experiences of many generations of hunters, who were intimately familiar with and dependent on the patterns, nuances, and changes of their environment. Enskilment, for the community, is an important mechanism of intergenerational experience – the carrying forward of knowledge that cannot exist outside of practice; kayaking contains types of knowledge that cannot be transmitted, but rather must be re-constructed in the personal experiences of each generation. This distinction is important because archaeological narratives of Inuit origins and development are often dependent on an implied passivity of transmission (Knudsen 2005). As archaeologists, we have a tendency to conceptualize the past in terms of change and continuity, and direct explanations of process at observable discontinuities.
in material culture (Johnson 2006; Pauketat 2013). The *co-construction* of knowledge between
the skilled community and beginners is a topic that will be revisited and refined throughout this
dissertation as the broader process of enskilment in kayak hunting is explored in more detail. It
will be argued that understanding the impermanence and inherent creativity through which
environmentally situated knowledge is re-grown in the experiences of each generation allows for
more nuanced archaeological narratives which emphasize skilled practice on the part individuals
as causative agents at work in the deeper history of Inuit culture.

1.1.2 Thesis Structure

Through enskilment, the modern kayaking community is learning about the lived
experience of past Inuit communities through material culture – a goal that is similar to that of
archaeology, yet different in the process through which knowledge of the past is constructed. By
working with the community to understand the dynamics of enskilment as a cultural process that
is contextual to a particular practice, a principal goal in this dissertation is to better interpret the
archaeological record of Inuit culture. I am interested in specifically directing this at
archaeological questions about the long term relationship between Inuit culture and the
environment, from the Thule migration and subsequent diversification of Inuit descendant groups
to colonial interaction in the historic period. By identifying kayaking as an important framework
of intergenerational continuity in personal experience, I hope that this project also contributes to
broader anthropological questions about situating the environmental context of human action.
Indeed, the nature of *materiality* – defined here as the extent to which material engagement
shapes the very aspects of past societies we endeavour to study – has emerged as one of the most
important theoretical topics in archaeology and anthropology as a whole (Alberti & Marshall
2009; Boivin 2008; Hodder 2011a; Ingold 2011; Knappett 2007; 2011b; Lucas 2012;

For archaeologists, who study the past through an interpretation of material culture, an
important observation is that environmental knowledge can be embodied through technical
enskilment (Ingold 2000). Chapter 2 explores the theoretical field of learning and practice,
specifically focusing on the position of sensorimotor skills in cognition – the process through
which individuals come to perceive the world around them. Starting with an important
distinction between *explicit* and *tacit* knowledge. Chapter 2 sketches a practice based model of culture, where dispositions in practitioners emerge at least partially through the physicality of technical enskilment. Communities of practice, which catalyze partly through enskilment, are inextricably intertwined with and contextual to the physical and social environments in which they are situated (Lave & Wenger 1991). The chapter considers the types of archaeological contexts through which enskilment can be studied, and it sets up a line of enquiry through which these can be addressed through ethnoarchaeological analogy.

To anchor theory to the fieldwork in Greenland, Chapter 3 summarizes the archaeology and ethnohistory of Inuit kayak hunting. The chapter draws on archaeological analyses that I conducted at *Nunatta Katersugaasivia* (The Greenland National Museum), and the Danish National Museum, which examined operational sequences of kayak construction through artefacts in both archaeological and ethnohistorical collections (Walls 2010, 2012b). In this chapter, the archaeological signature of kayak hunting is explored through multiple lines of evidence from sites across the Arctic. Although complete kayaks do not generally preserve, they are commonly represented in archaeological assemblages by pieces of driftwood frames, patterns in faunal assemblages, small models/toys, related hunting equipment, a variety of stone features associated with storage, and artistic depictions of hunting scenes. These archaeological signatures are examined in the context of the broader events that underwrote the Thule migration and the subsequent diversification of local Inuit groups. Through the archaeological record, it is apparent the kayaks must have played a very important role in mediating the encounters of the first Inuit ancestors with the geography and ecology of the Eastern Arctic. Chapter 3 also summarizes the rich ethnohistory of kayaking in Greenland. There are many historical sources that document the position of kayaking at the intersection of many social and ritual aspects of traditional life. Kayaking remained an important part of livelihood and subsistence throughout the colonial period, and the skill was an important point of separation in identity between Greenlandic Inuit and Europeans.

Kayaking in modern Greenland is very different than its centrality in traditional subsistence; it occurs in a context of a rapidly changing Arctic environment, and there are many looming challenges for Inuit. Although there is continuity in the practice of kayaking in Greenland, its popularity today is largely the result of a deliberate and organized intervention that started in the mid 1980s with the formation of *Qaannat Kattuffiat* (The Kayak
Organization). Chapter 4 examines the relationship between kayaking and heritage in Greenland through documenting the origins of *Qaannat Kattuffiat*, specifically its context in relation to Greenlandic independence, and the ongoing development of an Inuit-defined concept modernity. It will be shown that kayaking in the present must be understood as a heritage practice, rather than the vestige of a traditional way of life. In rebuilding a skilled community *Qaannat Kattuffiat* has, among other carefully discussed modifications, opened the practice to both genders and has developed a competitive sport to vitalize participation. Chapter 4 discusses these dynamic contexts of the modern kayaking community and begins a discussion of the analogical potential for interpreting the archaeological record that will be developed throughout the thesis.

Chapter 5 documents the technical processes through which kayaks are built in the modern community, focussing specifically on the carpentry and assembly of the frame. This is a subject where the overlap with archaeology is especially clear; studying the operational sequences – the *chaînes opératoires* – through which artifacts are made and used is an important methodology through which archaeologists learn about past technologies, cultural dispositions, and training strategies. There are several aspects of kayak construction that are useful to consider in terms of the research question for this thesis. The modern community emphasizes kayak construction as a didactic process. Building is felt to be an important part of becoming a skilled kayaker, and through the process, individuals embody the knowledge and experience that is a part of their design. In constructing a kayak, builders are not just replicating an archetypal form – rather, piece by piece, they are engaging in a process of cascading decisions where actions made at one stage affect many others (*as per* Dobres 1999; 2000; Ingold 2011; Keller & Keller 1996; Lemonnier 1993; Leroi-Gourhan 1993; Marchand 2008; Schlanger 1994; Sørensen 2006; van der Leeuw 1993). Through careful documentation and discussion of the decisions and challenges at each stage, it will be demonstrated that construction is inherently a creative process, where builders work towards goals related to the scenarios of use, invoking community experience rather than an underlying cultural schema of the ‘right way’ to build a kayak. For the community, kayak construction acts as a framework for experience – by negotiating with each piece, kayak builders make technical decisions that run parallel to those of their ancestors, and in drawing on the experience of others in the community, they develop an intuitive sense of how the technology works.
However well designed, kayaks are useless without skilled operators. Chapter 6 looks at the personal development and physical conditioning involved in kayak enskilment. Kayaking requires a high degree of skill, and it can take many years of careful training to develop the requisite abilities to be able to hunt. This chapter examines the requisite skills that are a part of kayaking, and it focuses specifically on how kayakers learn emergency rolls – which are one of the most difficult sub-sets of skill in kayaking. As with harpooning, rolling a kayak depends heavily on kinaesthetic awareness and embodied responsiveness. The acquisition of ability is a matter of enskilment, and is a developmental processes of co-construction between learners and the skilled community.

Chapter 7 draws together observations about the physical process of building kayaks and learning to use them as outlined in chapters 4, 5 and 6. This chapter looks at the composition of the community of practitioners, and examines how knowledge is co-constructed by learners. Enskilment, it will be proposed, is a transformational process through which individuals develop an intuitive sense of the world around them, and it is an important cultural mechanism, wherein shared experience catalyzes a community defined through practice. This chapter will also assess how the modern kayakers perceives the relationship between their practice and Inuit heritage and will discuss the type of knowledge that they generate about the past Inuit communities through practice.

In discussing the conclusions of this thesis, and drawing the observations together and positioning them in archaeological theory, Chapter 8 reflects back on the original question about the deeper history of kayaking posed at the beginning of this chapter. It revisits the fragmentary material record that represents Inuit communities in the more distant past. This chapter explores how analyses of learning and the complex sensorimotor skills underlying the art of making and using kayaks can shed light on the role of kayaking in the development of distinct communities of practice during the Thule migration and subsequent Inuit history. This chapter concludes with a narrative constructed on the hypothesis that the technical skills involved with kayaking played a defining role in the process through which Inuit communities acquired new environmental knowledge about the diverse new ecologies, geographies, economies and social environments experienced through the course of Inuit history. This chapter also assesses the field project, and raises new questions that can be asked both of the ethnographic potential for modern kayaking, as well as the archaeological understanding of Arctic prehistory.
1.2 Situating the Fieldwork 2009-2011

The ethnoarchaeological fieldwork that this dissertation is based on consisted of three summer field seasons, when the kayaking communities are most active. The project started with a pilot study in 2009, which helped to form a collaborative partnership with the kayaking community and to identify potential ethical concerns. This was followed by two full field seasons during the summers of 2010 and 2011, where I worked primarily with kayakers participating in Qaannat Kattuffiat. The bulk of the fieldwork was conducted in Sisimiut, where I developed a particularly close relationship with the local kayaking club. The project also included research in Ilulissat and Nuuk, and I spent time working in each of the three communities in all three seasons (Figure 2). Due to several organized kayaking events that drew national participation that occurred while I was working in Sisimiut, Ilulissat, and Nuuk, I was also able to work with and interview members of the kayaking community from Qaortoq and Upernavik.

1.2.1 Project Development

The context of kayaking in contemporary Greenland as an exploration of Inuit heritage was a defining part of how the field project developed and progressed. As detailed in Chapter 4, through kayaking, the community has been trying to better understand the lived experience of past Inuit communities. Over a 30 year period, the community has been involved in an intergenerational dialogue about the importance of the practice; cultural meanings contained in the technical process and the types of environmental knowledge that they seek to preserve have been discussed many times over within the community.

During the pilot season, I became friends with several members of the kayaking community in Sisimiut, who helped me to develop a collaborative relationship with the broader community, and they played an integral role in the research throughout the fieldwork. By working together, we identified overlapping interests in heritage, developed key research questions, and assessed the types of social processes and activities in which I could participate.
Figure 2 Map of Greenland with locations referred to throughout the text
The primary research strategies that were employed during the fieldwork were participant observation and formal interviews. The data assembled through the fieldwork thus includes translated transcriptions from interviews, field notes, film footage, and photographs. As the project developed and expanded, I was able to take part in the daily activities of the clubs, observing and filming activities like kayak construction, training sessions, and personal fitness conditioning, as well as community events such as the national competition and *Qaannat Kattuffiat* meetings. Visual media – both still photography and film – became an essential aspect of the fieldwork as a means of studying some of the more physically expressed aspects of the practice. To understand how different types of knowledge exist in the kinaesthetic side of the skill, film was a particularly effective research tool. Working closely with kayakers, we were able to capture many of the manoeuvres and techniques, at times using a waterproof camera.

In addition to conversations and short interviews during club activities, I also conducted more formal interviews with individuals. These in-depth interviews were mostly filmed and were often multi-staged, taking place over several field seasons in some cases. The interviews represented a good cross section of the kayaking community – both male and female – ranging from Elders who grew up in a time when kayak hunting was still an important part of family subsistence, to members who were a part of the development of *Qaannat Kattuffiat*, and novices who have just joined the community and were learning the skills for the first time.

The strategies for conducting formal interviews – which supplemented conversations that took place as a part of participant observation – evolved through the course of fieldwork. For the first interviews, I had developed specific questions that were thematic, so that I would be able to systematically compare and contrast answers between individuals. However, it quickly became apparent that many of the early questions I was asking during interviews about personal experience and enskilment were topics that they had discussed many times over within the community. Again, the overlapping interests in heritage characterized the eventual interview process that emerged – what I found was that in most cases, the topics I was interested in were generally subjects that individuals had well thought-out opinions on, sometimes developed through years of discussion within the community, and individuals had developed clear and

---

1 I had originally planned to conduct semi-structured interviews which would lend themselves to coding and qualitative analysis (e.g. Bernard 2011: 156-182).
explicit opinions about the particular topics. Interviews were most productive where the individuals being interviewed were able to choose topics that they felt were important to emphasize. Detailed interviews were conducted with the individuals outlined in Table 1, who will be introduced individually as direct quotations from their interviews appear in text.

Table 1 Individuals that participated through formal interviews

<table>
<thead>
<tr>
<th>Male Interviewees</th>
<th>Birth Year</th>
<th>Community (Present)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kampe Absolonsen</td>
<td>1941</td>
<td>Ilulissat</td>
</tr>
<tr>
<td>Aalibak Agustussen</td>
<td>1950</td>
<td>Sisimiut</td>
</tr>
<tr>
<td>Jaffet Davidsen</td>
<td>1984</td>
<td>Sisimiut</td>
</tr>
<tr>
<td>Kristian Johansen</td>
<td>1933</td>
<td>Sisimiut</td>
</tr>
<tr>
<td>Johan Kristiansen</td>
<td>1958</td>
<td>Nuuk</td>
</tr>
<tr>
<td>Jørgen Leander</td>
<td>1970</td>
<td>Sisimiut</td>
</tr>
<tr>
<td>Emaanooraq Nathansen</td>
<td>1987</td>
<td>Sisimiut</td>
</tr>
<tr>
<td>Maligiaq Padilla Johnsen</td>
<td>1982</td>
<td>Sisimiut</td>
</tr>
<tr>
<td>John Pedersen</td>
<td>1963</td>
<td>Ilulissat</td>
</tr>
<tr>
<td>Niels Thomassen</td>
<td>1967</td>
<td>Upernavik</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Female Interviewees</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Napaartoq Dalager</td>
<td>unknown</td>
<td>Sisimiut</td>
</tr>
<tr>
<td>Babiane Isaksen</td>
<td>1927</td>
<td>Qaaportoq</td>
</tr>
<tr>
<td>Ulhumnuag Rosbach</td>
<td>1982</td>
<td>Sisimiut</td>
</tr>
</tbody>
</table>

1.2.2 Fieldwork Ethics

The context of kayaking as an exploration of heritage also defined the ethics considerations that were a part of this project. During the pilot study, the primary ethical consideration identified by the kayaking community was that the research should result in something meaningful for the community. It became clear that the project should aim to achieve more than simply a dissertation and journal articles, directed to an exclusively English-speaking and academic audience. In developing the project, I have thus sought to present the research in a way that is accessible for the community. This has resulted in a number of different initiatives that have been developed in addition to this dissertation.

Visual media emerged very early in the project as an important component of the research methodology as well as a key aspect of practicing ethical fieldwork. Participating in the daily activities in the kayaking community, I was able to film construction projects, skills training, personal conditioning, community meetings, and many other events. I conducted and
filmed short interviews during community events, as well as longer interviews about personal histories and experience. Between the three years of fieldwork, I compiled a substantial amount of film footage and photographs. Digital photos, video and sound are easily stored and passed on to the community in a variety of accessible formats. The visual media convey much more meaningful information to the community than my field notes ever could. Most of these materials have already been passed along to interested community members. With the completion of this project, all of the film and photos from the project will be archived at Nunatta Katersugaasivia (The Greenland National Museum), and they will be made available to anyone who requests them.

In an effort to make the work accessible as it unfolded, I also created an interactive new-media website in both Kalaallisut (Greenlandic) and English\(^2\). The website hosts information about the project, including complete interviews with Elders, which can be streamed along with some short edited webcasts. With the spread of cheap broadband internet in Greenland since 2011, the website has become more accessible and is available to most households. The website, while effective in presenting information, also became an important research strategy and provided interesting opportunities for self-reflexivity in the project (see below).

In addition to the website, another important part of the project has been to use the video from the fieldwork to create a documentary film – a possibility that was originally suggested by an Elder named Aalibak Augustine during the pilot season. The short film entitled ‘QAJAO: A Living Tradition in Greenland’ is still in the process of being edited and will not be complete before the defence of this dissertation. However, a trailer for the film can be viewed on the project website\(^3\). The film will be in both Kalaallisut and English when completed. QAJAO is narrated primarily through interviews that were conducted as a part of the fieldwork. The film is taking time to produce because it is going through a process of community review. As sections are edited and sequenced, they are shown to the kayakers involved in the production (via online streaming) who are able to comment on the film and to make suggestions about how it should be

\(^2\) Website Address: [http://www.qajaq.utoronto.ca](http://www.qajaq.utoronto.ca)

\(^3\) Film Trailer: [http://qajaq.utoronto.ca/english_site/film_trailer/film_trailer.html](http://qajaq.utoronto.ca/english_site/film_trailer/film_trailer.html)
adjusted. This process, while lengthy, has been instrumental in ensuring that the community can hear their own voices in the work.

Language was also a very important aspect of fieldwork ethics to the community. Wherever possible, and especially in filming interviews that could be of future interest, the community wanted the language of communication to be Kalaallisut. Indeed as the project progressed, it was often suggested by both informants and translators that there are certain aspects of kayaking that are difficult to express in English or Danish. Language was a personal challenge for me in conducting the fieldwork – going into the project I had taken some Inuktitut courses in a Baffin dialect, but was not able to communicate in Kalaallisut. During the project, I learned a great deal of Kalaallisut as a part of the three field seasons, but I have not yet been able to develop fluency in the way that other anthropologists such as Mark Nuttall (1992) have. Interviews, and many club events, were observed through at least some degree of formal translation between Kalaallisut and English or Danish. As the project progressed, I worked with several kayakers who helped to translate from Kalaallisut to English or Danish, including Emaanooraq Nathansen and Maligiaq Johnsen Padilla. Through funding from the Wenner-Gren Foundation, I was eventually able to hire Middlarsk Iennert – a Social Sciences student at Ilisimatusarfik (University of Greenland), who in addition to translating for formal interviews with Elders, also evaluated footage and created transcripts for previous years' work.

The project was approved by the University of Toronto's ethics board and renewed annually. However, in Greenland, the process of ethics clearance was in development at the time of my research. I contacted the Ministry of Family, Culture, Church & Gender Equality, but they did not have an official process as it was previously handled by Danish authorities prior to the 2009 transition to self-governance. I worked through affiliation with Nunatta Katersugaasivia ( Greenland National Museum) and sought official approval for my project from Qaammit Kattuffiat directly.

As with any ethnographic fieldwork – and especially with the emphasis on visual media – it was very important to ensure that informed consent was a part of the research. I obtained consent through signed forms accepted by the U of T ethics board. Much of the research involved participant observation at public events where it was difficult to obtain individual consent forms from all those present. In order to ensure that there was community consent for me to participate in and film public events, I went through an approval process both at the local and
national level of *Qaannat Kattuffiat*. In Sisimiut where most of the participant observation was conducted, I introduced project at a club meeting and the club voted and approved my participation, and a group consent form was signed by the club president. For the National level, I took the same approach and was introduced at the annual *Qaannat Kattuffiat* board meeting by the president, Niels Thomassen. Once again, my participation and ability to film/photograph events was approved in a vote, and Niels signed a group consent form. Through these processes of approval, it was clearly communicated that participation in my research was strictly optional. In daily activities, I was careful about which events to film and endeavoured to be as un-intrusive as possible. No issues or disputes arose during the course of fieldwork.

The personal identity of participating individuals is often an ethical consideration for the writing of ethnographic texts. Given the project’s emphasis on exploring practice and skill, I found that some individuals I worked most closely with preferred to be clearly associated with their knowledge and contributions. Due to a number of considerations, I have used the real names of individuals in this dissertation for cases where I draw on excerpts from formal interviews, where I’m describing public events such as the national competition, and for Elders who expressed the wish to be associated with their contributions. For situations where I am describing observations from participation in daily events, and in the case where participants were under 18, I have opted to use pseudonyms or to avoid direct identification (for example in the training scene described at the beginning of this chapter).

### 1.2.3 Reflexivity and Verification of Concepts

The data on which the concepts in this thesis are based are primarily qualitative; they are conceptual, difficult to verify statistically, but are nonetheless meaningful and pertinent in understanding the archaeological record of Inuit culture. Examining the process through which concepts emerged through fieldwork, and reflexively assessing how they are verified, has proved critical to analyzing the data in this project and writing this dissertation. The nature of modern kayaking as an exploration of heritage offered many unique opportunities for reflexive assessment. The cultural importance of kayaking, the nature and types of knowledge that are involved in the practice, and the position of the physical process as a constitutive aspect of Inuit
culture have been topics of discussion within the kayaking community for over 30 years. Indeed, the community is engaged in its own process of self-reflexivity.

The use of photography, film, and webcasting originally started as a means of presenting the research in a way that was meaningful for the community, in order to address the important ethical concerns raised during the pilot project. However, visual media, and accessibility through the internet quickly became an important research tool for capturing the more intangible and indescribable aspects of the skill. In 2009 and 2010, there were a lot of filmed interviews, footage from daily club events, and photos that could be referred to while doing fieldwork in 2011. Participants were able to look back through the footage of the previous years and comment on what they meant in certain parts. Because the interviews are available through the website, many were able to watch them and communicate through email or in person during my return visit in 2011. As will be documented in much more detail in chapter 6, capturing the movements involved in rolling, for example, I was able to review the footage with participants and explore how we wanted to set the camera up and look at different aspects of particular techniques.

In the end, the creation of the documentary film has become a very important part of analyzing the data. The film, using the conventions of documentary films, is heavily edited and involves a great deal of liberty in choosing clips from interviews, and matching them with footage from training sessions or of the landscape. To give certain scenes flow and to make them more palatable for the viewer, it even has a musical track. However, because it was made available online and shared with the local clubs, there has been a great capacity for community input. In editing the film, I adopted the approach of making some clips available to participants in order to obtain their feedback in how segments of their interviews are arranged, to ensure they feel the final version fully captures their meaning. This has been an extremely productive if time consuming endeavor. Opening the editing process to the community has been an opportunity to expand the communities’ involvement in refining the social realities that both the film and this dissertation (by proxy) attempt to capture and transpose. This approach of using film as a mechanism of reflexivity has been experimented with by Nicholas David and Judy Sterner (David and Kramer 2001: 83, 420) as well as Willeke Wendrich (2001).

Anthropologists have many options and literary tools at their disposal in the crafting of ethnographies, and a point that is no less relevant to ethnoarchaeologists is that the format of presentation is often as important as the content. David and Kramer (2001:56) note that much
ethnoarchaeological writing "remains fixed in a naturalist and generally un-reflexive mode". In writing this dissertation, I have endeavoured to be very explicit about the reflexive process through which concepts emerged and were verified through the fieldwork. The next few chapters draw on the ethnoarchaeological fieldwork in an effort to depict observations and concepts that are of direct and important relevance to understanding the archaeological record. As a text and figure document, the media of presentation for this dissertation is quite different than the options available for the documentary film and project website. However, the crafting of this dissertation is also informed by the same process of discussion and re-discussion that emerged during the fieldwork. In weaving together the diverse types of data involved in this project, the decisions that I have made in how to organize and illustrate this dissertation are informed by this process of community reflexivity, and I think are representative of the dialogue that has emerged over the course of this project.

Mark Nuttall (1992:2-3) introduces his ethnography of the Upernavik district by explaining that he feels there was much more to grasp than he had opportunity to learn and write about at the time. Although he was adopted by a local family, and bases his vivid contextualizations of Inuit life on profound personal relationships and experiences, he frankly notes that feelings of intrusiveness as an inquisitive outsider never left him during fieldwork, and that the ethnography he produced is not written to be a closed authoritative account. He later describes his dissertation as a 'progress report' (Nuttall 1992: 179). Following Nuttall, this ethnoarchaeological dissertation contains a provisional account, and I do not intend it to be closed depiction of the modern kayaking community. While much of the knowledge I present in this dissertation emerged from working closely with the community, it is important to stress that I also experienced limitations to my participation as an ethnoarchaeologist. There are certain facets of the kayaking community which deserve a more detailed consideration than I have been able to provide here. For example, as will be discussed in Chapter 4, the changing dynamics of gender participation in kayaking as the community has adapted it from a subsistence skill to a heritage practice is one of several important topics that I have not yet been able to fully address. Throughout this dissertation, I try to avoid a tone of finality by describing some of the access challenges that I faced in the fieldwork, highlighting areas that deserve further research, and discussing the relevance of these gaps for understanding Inuit communities in the more distant past.
1.2.4 In-text Quotations and Translation

Language, as noted above, was a primary concern for the community, and an important aspect of conducting ethical fieldwork. Throughout this dissertation, I have illustrated points that are being made through direct quotations from individuals in the community. These are extracts from the formal filmed interviews. For the most part, the quotations are translations from Kalaallisut, and I have included the initials of the translators involved in conducting and transcribing the particular interview. Midtlarak Lennert (ML) was the primary translator, but Emaanoooraq Nathansen (EN), and Maligiaq Johnsen Padilla (MJP) – who are both kayakers and English speakers – also helped to conduct interviews, and assisted Midtlarak with translating some of technical terminology. For example, this is an excerpt from an interview that Maligiaq, Midtlarak, and I conducted with Johan Kristiansen, an Elder from Sisimiut who used to practice kayaking hunting in the late 1950s:

I have many good memories from kayaking. To paddle in good weather, and catch seals. Even just to paddle around the small pieces of ice or just to walk around on the ice without catching anything is a good memory. It was so silent, so nice.

Johan Kristiansen (2011) MJP/ML

Due to situational contingencies, several interviews were conducted partly in English/Danish, or were translated into English/Danish by the interviewee themselves. These are particularly the case for John Pedersen who is a kayak hunter from Ilulissat. In the interview below, I was asking him questions in English and he would answer first in Kalaallisut, and then in English. Where he is translating his own words from Kalaallisut, I have included his initials as the translator, and when the quotation is directly from his words in English, I have simply included his name:

Example 1 (John Pedersen translating his own words from Kalaallisut to English)
So, one of the first memories that I have is that my uncle was in a kayak and we followed him from a distance from a boat. He was hunting a ringed seal, and he was hunting that ringed seal for quite a long time I remember, because he always wanted to get near the seal, but the seal was about 20 to 15 meters from him all the time. But he wanted to get closer.

John Pedersen (2010) JP

Example 2 (Transcription of John Pedersen speaking directly in English)

At that time I was 7-8 years old but my uncle didn't want me to enter kayaking because he thought I was too young. So he waited a couple of years, and it was when I was about 12 years old that he started to teach me. And then, it stopped for some years. I had to go to school in Denmark to continue my education, and when I came back from Denmark, he really started to teach me how. I was about 18 years old.

John Pedersen (2010)
Chapter 2
The Archaeology of Learning and Practice

Archaeological interpretation depends heavily on the concept of *agency* — defined here simply as 'that which causes something to occur'. The narratives that archaeologists produce for a particular region or culture might variously give agency to evolution, the environment, migration, power relations, population pressure, interaction, and trade, among many other possibilities. As introduced in Chapter 1, the modern kayaking community in Greenland is exploring heritage through practice (see Andrews & Zoe 1998; Finney 1991, 1994 for similar examples). By building kayaks and becoming skilled in their use, individuals develop subjective experiences of the environment that run parallel to those of their ancestors. Through enskilment, kayakers develop an intuitive sense of the lived realities of past Inuit communities, which is *embodied*, or contextual to the physicality of experience; this knowledge transposes to new situations, carrying forward intergenerational engagements with the environment that can only exist in practice. The modern kayaking community identifies skilled practice as having a constitutive role in the deeper history of Inuit culture. This works against archaeological and historical narratives, where the entirety of Inuit history is sometimes told through external agents such as climate change, introduction of Christianity, 'top-down' colonial power relations, incorporation into a world system, Danish governance, etc (Cabak & Loring 2000; Graugaard 2009; Knudsen 2005; Nuttall 2008). Rather than members of a timeless and passive cultural entity, the modern kayaking community frames Inuit as causative agents of their own history, where creative responses as a skilled community to an impermanent physical and social environment patterned the manner through which the past unfolded as a uniquely Inuit story.

In this chapter, I explore social theory to develop an understanding of the role of skilled practice in Inuit culture through time. My goal, here, is not to reframe the experiences of the

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4 As Robb & Dobres (2000:3) note, few archaeologists are explicit about what they mean by 'agency'; it has such a varied use in archaeology that it is not always clear if we are talking about the same thing. Recognizing that the concept is extremely diverse, and that it is often taken to imply 'action by a thinking being', I favour a simple and broad definition adapted from Ingold's (2011:90) and direct the concept towards the construction of archaeological narratives of process.
modern kayaking community or to suggest that anthropological theory has a better grasp of the role that skills play in culture –indeed it will be apparent in Chapter 4, that the relationship between skill, the environment, and Inuit culture is a topic that has been discussed many times over in a 30 year process of community development. In exploring resonance between Inuit conceptions of agency with social theory, the objective is to find a means to precisely describe and contextualize the types of knowledge and learning involved in technical skills, their relationship to culture as a whole, and how archaeologists who also study the past through material culture can include the agency of skilled communities in their narratives of past processes.

Drawing on the training session described in Chapter 1 as an illustrative example, this chapter sketches a practice-based model which emphasizes the role of enskilment as an important aspect of personal and subjective experience. By identifying types of knowledge that exist in a complex skill such as kayaking, and understanding the situated process through which they are learned, I draw heavily on Lave and Wenger's (1991) concept of 'communities of practice' that emerge through enskilment. The kayaking community can be considered a community of practice, where the dispositions of participants emerge through parallel engagement with the environment. The chapter then discusses the archaeological potential for understanding the agency of communities of practice through time, how archaeologists already identify them through artefact assemblages, and how they might be better understood through the use of ethnoarchaeological analogy.

2.1 Learning and Practice in an Environment

Within the modern kayaking community's focus on practice, there is a definition of culture that works against normative views that remain common place in archaeology (Lucas 2012). For the community, Inuit culture is not just a set of interrelated meanings, or a culturally relative and self-contained logic that explains how their environment and social relations work through rules, taboos, norms, etc. Instead, Inuit culture and their unique perspectives of the world around them are emergent, at least partly, in the direct experience of interacting with the environment in particular ways. This resonates very strongly with the perspective of Tim Ingold
(2000:18), who invokes Gregory Bateson's' (1972) tenet that "stable features of the environment remain imperceptible unless we move in relation to them." Ingold further argues that the perception of the environment is relative to the manner in which it experienced. This perspective draws attention to the role of skill, and raises questions about the process through which it is learned, and the types of knowledge that exist within practice.

2.1.1 Explicit and Tacit Knowledge

Skills can depend on many different types of knowledge, and it is useful to draw on Michael Polanyi's (1958; 1967) distinction between 'explicit knowledge' and 'tacit knowledge'. Explicit knowledge is the type of knowledge that we primarily think about in academia; it is knowledge that can be codified and represented through abstract means such as words, symbols or mathematical equations. Ideally, explicit knowledge can exist outside of any particular individual's personal experience, and can be stored through various media. Tacit knowledge, however, is more closely related to intuition; it is personally subjective, intangible, and cannot be transferred between individuals through abstract representation. Tacit knowledge is evident only in practice, where perceptive ability and intuitive responses are informed by personal experience rather than theory. Polanyi notes that tacit knowledge and explicit knowledge are not necessarily exclusive of each other and that they form a continuum. For example, in attempting to present cultural phenomena and field experiences through text and images, this dissertation is an exercise in the production of explicit knowledge, yet it cannot be assumed that it will be passively 'absorbed' by readers whose tacit knowledge will define the way that it is interpreted. Individuals are not necessarily conscious of the tacit knowledge they possess, although it can be an important aspect of how they act in the world. Polanyi's project was to show that even in 'hard sciences', such as cosmology, the discovery of new concepts depends heavily on researchers' intuition or sense of how the world might function, rather than pure extrapolation of pre-existing explicit knowledge.

This continuum of knowledge is at the very heart of understanding the position of traditional kayaking in modern Greenland. Tacit knowledge is contextual to personal experience, and as such, it is social and situated in the environments where people interact. Indeed, tacit
knowledge is an important aspect of indigeneity – the meaningful constitution of identity in particular landscapes (Basso 1996; Bastein 2004; Brody 2000; Viveiros de Castro 2004). Differences between 'Danish ways of knowing', and 'Inuit ways of knowing' are central to discussions of cultural heritage in modern Greenland (Nuttall 1991; 2010). This point is explored in more detail in Chapter 4, which examines the development of the modern kayaking community and the relationship between their emphasis on tacit knowledge and Greenlandic independence. Explicit knowledge has the potential to uproot the value of local knowledge and remove the authority of personal and collective experience. The conversion of tacit knowledge to explicit knowledge through the mechanization of skilled labour is a common thread underlying the power dynamics of colonialism, industrialism, and the digital revolution (Frink 2007; Ingold 2011; Nuttall 1990; Ortner 2005; Warnier 1995). As Nonaka (1994) convincingly demonstrates, the appropriation and re-contextualization of certain traditions of tacit knowledge is a vital aspect of corporate success.

The distinction between explicit and tacit knowledge is particularly visible in the learning and performance of sensorimotor skills, and especially those which depend on a high degree of developed ability, such as kayaking (e.g. Annett 1994; Downey 2010; Grush 2004; Light 2011). In recalling the episode of enskilment described at the beginning of Chapter 1, where harpoon throwing was being taught, it is clear that the act of throwing a harpoon from a kayak using the norsaq is dependent on tacit knowledge. The skill itself cannot be transmitted between individuals – rather it must be co-constructed through training. To explore this further, and to make finer distinctions about the types of tacit knowledge involved in kayaking, it is useful to examine the scenario that the training session is simulating – the moment when a skilled hunter draws the harpoon to strike. The following descriptions of embodied responsiveness and kinaesthetic awareness are adapted from Walls (2012a):

*Embodied Responsiveness*

To act at the correct moment, the kayaker must be able to instantly recognize and respond to subtle environmental cues. Embodied responsiveness is defined here as the ability to recognize a situation using any combination of senses and to react intuitively. Hunters must be familiar enough with sea-mammal behaviour to recognize the ideal
conditions to strike. As the opportunity may only exist momentarily, the appropriate reaction must be instantaneous; the senses must be attuned to perceive whether the animal is within range and how the action could affect others in a hunting team. In recognizing the moment, there are many sub-phases of the reaction that rely on embodied responsiveness. For example, the selection of the appropriate weapon, its preparation, the force/angle of the throw and the deployment of the secondary equipment must be well-practiced responses. Even the shifting of muscles to compensate balance for the redistributed weight as the weapon is drawn and thrown are a momentary response that the hunter must be able to do without pausing to contemplate or the kayak will capsize.

*Kinaesthetic Awareness*

Embodied responsiveness depends on kinaesthetic awareness – also referred to as 'motor memory', or 'body knowledge' – which is the performance of physical actions that are dependent on developed musculature and muscle memory (Adams 1987; Miller 2012: 230; Wendrich 2012: 4). Kinaesthetic awareness is typified by skills such as touch typing, where a person does not have to consciously think about where their digits fall. As with the letters on a keyboard, kayak hunters must know where their equipment is positioned without a discrete pause to think about it. In the action of throwing, a good strike depends on form. From a seated position, hunters must throw with both their arms and core muscles, requiring a developed fitness.

2.1.2 Enskilment and Situated Learning

The fact that tacit knowledge is inseparable from the particular environmental milieu in which learning occurs is a point that is often overlooked in normative theories of cognition (Bateson 1972; Clancey 2008; Clark & Chalmers 1998; Gallagher 2012; Henrich et al. 2010; Hutchins 1995; Malafouris 2013). As Gisli Pálsson (1996:29) notes, the academic bias towards explicit knowledge results in a tendency to frame the learning of skill as matter of "mechanistic internalization and application of a mental script, a stock of knowledge or a 'cultural model'" (see
also Marchand 2008) . This bias pervades normative theories of culture which have been noted to implicitly linger in the archaeological literature of Greenland (Knudsen 2005; Toft & Seiding 2013). Culture as 'super-organic heritage' which can exist externally to the experiences of any particular individual is an explicit conception of knowledge (Gallagher 2008; Ingold 2000:36, 2001). In this view, the acquisition of culture, or enculturation, is a process of socialization, perhaps different than how learning is conducted in a classroom, but nonetheless still entails the assimilation of norms, rules, symbols, and expected modes of conduct (e.g. Atran & Medin 2008). In such normative models, learning a skill is easily imagined to be a similar process to memorizing a theory for a test. Through their training, individuals internalize a codified and abstract schema, and in practicing a skill, the action of individuals is in reference to this blueprint for action – their skilled action is a proxy of the schema and any deviations are a matter of error. Perhaps knowledge is learned through socialization, or 'embodied' through repetition, but in any case, normative conceptions of skill are an iteration of explicit knowledge – the cultural model or schema that guides skilful action can exist in many individuals' heads at once, like software, de-contextualized from the environment (Clancey 2011; Ingold 2011: 54).

However, enskilment is a process that can only take place immersed in an environment (Eliassmith 2009; Gallagher 2012; Pålsson 1996; Warnier 2007; Wenger 1998). Skills are dependent on tacit knowledge, and cannot be passively acquired – they are developed through deliberate and focussed practice on the part of the learner. Lave and Wenger (1991) describe enskilment as 'situated learning' – a type of learning that is situated in actual tasks where the performance of a skill is required. Situated learning is a collective enterprise where skill is not so much transmitted from a trainer as it is co-constructed (see also Ingold 2000: 146-147). 'Co-construction' is a term that I will use throughout this dissertation to describe a process of knowledge building which takes place through three important contributions: a learner who develops personal experience through practice, a skilled community that creates a framework for that experience, and an environment where the learner’s action and technical practice take place. The process of co-construction can be illustrated by reflecting again on the harpoon training session as an instance of situated learning. In directing attention to specific elements of practice, the teacher communicates through explicit knowledge codified through description, and possible to convey here through text; drawing on his own experience, he can coach by demonstrating the technique, or saying things such as "hold the harpoon like this"
Figure 3 Situated learning of harpoon throwing and co-construction of skill through the ebb and flow of explicit and tacit knowledge.

or "you can stabilize the kayak through your core muscles as you throw". Through explicit knowledge, the teacher can create a framework for experience, but the experience can only be realized and made tacit through the practice and agency of the learner (Figure 3) (Ericsson 2003; Ericsson et al. 1996; Keller & Keller 1999:27). For a complex sensorimotor skill like harpooning, it can take years of careful training to develop the ability. Some learners may possess a degree of natural talent, but all kayakers have to identify weaknesses and hone their ability.

Situated learning is effective where learners experience a state of 'flow' and are completely absorbed and emotionally invested in the success of their actions (Csikszentmihályi 1990; Hunter & Csikszentmihályi 2000). Flow requires clear objectives as well as mechanisms for feedback so that the learners can direct their practice towards particular goals, judging the effectiveness of their actions and creatively adjusting their performance (Csikszentmihályi & Bennett 1972). Rather than internalizing prescribed rules and norms that reduce skill to procedural memory, enskilment attunes the senses and develops the ability to discern and react intuitively. In acting and adjusting action to the flow of tasks at hand, consciousness is embedded in the environment. The tacit knowledge developed through the skill is pre-reflective, and to describe this, it is useful to introduce the term 'praxis', which can be described as practice distinguished from theory, or intuitive reaction dependent on personal experience and

The social context through which learning takes place can be culturally specific, and an important terminological distinction to mention here is the difference between how I use the terms 'apprenticeship' and 'situated learning' in this dissertation. As Lave and Wenger (1991:32) note, apprenticeship is the structuring of relationships between experts and learners – it is particular to historically and culturally situated concepts of education. Across the circumpolar Inuit world, for example, becoming a skilled kayaker marked life stages of increasing importance and connection in the community; as integral to apprenticeship, these could be marked through a variety of rituals, as will be explored further in Chapter 3. In other contexts of apprenticeship, the relationship between experts and learners may be formalized by social contracts and rules, and knowledge may be envisioned in explicit terms as something that is 'passed' from experts to learners (e.g. Dilley 1989: Frink 2009: 24; Marchand 2008). Apprenticeship may have strict rules regarding the age when it begins, who can teach the skills, gender restrictions, etc. (e.g. Wallaert 2012). Within apprenticeship, there can be very firm notions of 'right practice' with repetition and even corporal punishment for deviations from standard behaviour (e.g. Høgsøeth 2012; Hutchins 1995; Wallaert 2012:29; Wendrich 2012). Such forms of apprenticeship, however, do not necessarily mean that the tacit knowledge involved in a skill is not being co-constructed by the learner – even where it is highly structured, learning is inherently a creative process on the part of the learner.

2.1.3 Intersubjectivity and Communities of Practice

Although there is no 'super-organic' stock of knowledge that is being internalized, enskilment is an important cultural process. Indeed, dispositions acquired through the flow of activity in an environment form a core aspect of practice theory and Bourdieu's (1977) concept of *habitus*. *Habitus* refers to the dispositions, values, skills, taste, and posture that characterize the manner through which individuals act in the world. The word *'habitus'* is often casually interchanged with *'culture'*; but the distinction is that *habitus* is emergent in the personal experiences of individuals conducting their daily lives (Bourdieu 2002; Throop & Murphy 2002). Rather than a pool of meanings which exist external to the individual, people's intuitive understanding of the world around them is the result of practice. A key point about *habitus* is that
dispositions acquired through practice are transposable and they mediate the pre-reflective and reflective responses (praxis) to new situations and scenarios.

As seen through situated learning, enskilment is an important aspect of an individual's subjectivity – their unique abilities to perceive and respond in an environment are developed in part through their own creativity (Ingold 2000: 356-357; 2011:58-59). Each individual's skill may be contextual to their personal history rather than a super-organic and external stock of knowledge, but in a skilled community, subjective individual experiences converge with those of others participating in the skill. This shared subjectivity—intersubjectivity—is emergent in a community that has similar experiences, and whose senses are attuned to the same social and environmental subtleties; regularities in praxis emerge at least partially from dispositions acquired through enskilment (Gallagher 2008a, 2009; Latour 1992; Law 1999; Pfaffenberger 1999; Young 1990). When specifically discussing the dispositions related to the physicality of sensorimotor skills, a more precise term for intersubjectivity is 'intercorporeality' (Gallagher 2008b; Merleau-Ponty 1996; Warnier 2007; Weiss 1999).

Intercorporeality is a type of shared subjectivity or rapport which emerges between individuals through their participation in similar physical processes. For example, an archaeologist with some experience in flint knapping might perceive the value of a raw material found in an assemblage in a way that someone without experience would not. The archaeologist can explain the value of the material through explicit terms, noting that it is a 'fine-grained cryptocrystalline' etc., but his/her assessment is also partly intuitive and draws on a subjective sense developed through personal experience with breaking and fracturing similar materials. Intercorporeality, in this case, can be conceptualized to exist between the archaeologist and a flint knapper in the past who would perceive the potential of the material from a similar perspective. Although they both live(d) in very different social and environmental contexts, there is a shared subjectivity between them which is established through the physicality of experience. Intercorporeality is an important concept in this dissertation. In the present, the kayaking community is focussed on the physicality of enskilment as a means of developing knowledge about the lived experiences of their ancestors. In Chapters 4-7, I develop the relevance of intercorporeality in the context of kayaking and demonstrate how the process of building kayaks and learning to use them draws kayakers into the shared subjectivity of the community.
Understanding enskilment as a generative process of intersubjectivity is not to say that any one skill conjures the totality of a culture, or that a culture isn't anything more than an assembly of skills. However, emergent intersubjectivity can catalyze communities that are defined by a particular practice. 'Communities of practice', a term coined by Lave and Wenger (1991; Wenger 1998), are a collection of individuals who share tacit knowledge developed through learning and participating in particular skills. Communities of practice can be formalized through historically contingent forms of apprenticeship, or a structured recognition of the community's existence – for example, with a trade union. However, communities of practice occur wherever situated learning takes place, and can exist even where they are not formally recognized as a community by participants. A community of practice does not necessarily imply social solidarity, yet the tacit knowledge of participants can form part of a shared *habitus* that affects praxis in other aspects of daily life.

Because enskilment is contextual to personal experience, the topography of skill in a community of practice is complex and differentiated, and there can be as many degrees and types of participation as there are participants (Keller & Keller 1996; Lechtman 1999; Van der Leeuw 1993). To avoid basing the concept of a community of practice on a linear and packaged notion of skill, Lave and Wenger (1991) use the term 'peripheral participation' to describe each individual's unique pattern of enskilment. Figure 4 attempts to illustrate the concept of peripheral participation, and demonstrate its importance in the dynamics of a community of practice. Beginners start at the outside of the skill, and by developing their experience and ability, they are drawn closer into the intersubjectivity of the community. Some beginners will seem to have more natural talent than others, but all participants must hone their abilities, identify their weaknesses, and creatively adjust their performance. There may be regularities in the learning process, or even formally recognized stages of progression, yet no two individual's process of enskilment can ever be exactly the same. The concept of peripheral participation emphasizes that there is no endpoint to enskilment; even at the highest levels of expertise there can be disagreement about the notion of 'best practice'. However, there is a degree of intersubjectivity that pervades all levels of participation. Participants in a community of practice attune their senses to the same subtleties of the environment and develop similar capacities for awareness and response.
In Chapter 4, the concept of a community of practice is directed at understanding the modern kayaking community in Greenland. There are many recognizable levels of participation including Elders, experts, teachers, beginners, and people who participate through helping and supporting kayakers (Figure 4). With a sensorimotor skill as complex as kayak hunting, it is inherently the case that there are many levels of ability; some individuals appear to possess some degree of natural talent, others will learn more slowly and perhaps never develop some of the
more complex abilities. However, through enskilment, all kayakers are drawn further into the community of practice. Participants develop similar types of physical fitness and adjust their performance to respond to the same flow of activity – there is a degree of intercorporeality that pervades all levels of practice and grows stronger through enskilment. The community of practice that kayakers join also transcends time through the development of tacit knowledge similar to that of their ancestors. For Inuit communities in the distant past, kayaking likely intersected lives in very different contexts than it does for the modern community; kayaking was only one of many skills that played an important role in daily subsistence, and at different times, kayak enskilment was probably structured through historically specific forms of apprenticeship. However, the intercorporeality that is a phenomenon of the skill itself is the basis of the community of practice in which modern kayakers can be considered peripheral participants. Even the most skilled kayakers in the modern community essentially see their participation as peripheral to that of past Inuit communities, but through practice they move a little closer to the 'centre' and can peer in on their ancestors' lived experiences.

2.2 Communities of Practice as Archaeological Entities

'Communities of practice' is a concept that has a lot of potential as an interpretive construct for archaeologists in terms of the entities we think we are studying through material culture. As Matthew Johnson (2006:123) observes, most archaeological narratives still depend on dividing the past into "cultures, phases, and types", which are most commonly demarcated by observable changes and continuities in material culture (see also Pauletat 2001; Lucas 2012:188-189). Gavin Lucas (2012:198) notes that these entities are abstractions and that their ontological status is usually quite vague; although we acknowledge that 'pots don't equal people', there is a tendency for archaeologists to imagine that patterns in artefact assemblages represent people who shared the same mental templates. In a recent volume on the archaeology of apprenticeship, edited by Willeke Wendrich (2012:11), a common theme that runs through the papers is just how little attention has been paid to enskilment or learning as cultural processes outside of normative theories of culture and cognition – a point also very elegantly articulated by the
Material Engagement school (Malafouris 2013; Malafouris & Renfrew 2010) as well as Lucas (2012).

A great deal of the material culture through which the archaeological record is assembled can be seen as evidence of skilled practice, and through a variety of methodologies, archaeologists are often able to identify the persistence of certain practices over very long periods of time (e.g. Macdonald 2013; Wilkins 2012). For example, through studying the operational sequences, or chaînes opératoires, of artefact production, use and discard, archaeologists identify patterns in skilled practice (Dobres 1999; 2000; Lemonnier 1992; Pauketat 2001: 11; Pedersen 2008; Sorensen 2006). We might represent these as explicit forms of knowledge – procedural memory or blueprints for action, etc. – but their production usually involved complex motor performance and tacit knowledge (Chazan 2009; Creese 2012; Knappett 2011b; Leroi-Gourhan 1993). The dependence on normative models of cognition impacts the way that archaeologists understand historical processes. In creating narratives of the past, archaeologists tend to perceive persistence in practice as zones of stability, and stuff agency of varying kinds into the cracks around the observable edges of harpoon types, pottery styles, house forms, etc (Pauketat 2001). However, understanding the entity behind the persistence of a skill to be a community of practice allows for a greater depth in the types of narratives that can be constructed. Recognizing that artefacts represent physical participation of individuals in a community of practice is not an abstraction in the same way that 'type' or 'culture' are, and it links the community through intercorporeality, directly and materially with artefacts, rather than historically contingent structure (Hodder 2011a; Pauketat & Alt 2005).

The notion that intercorporeality transcends time raises a very interesting premise that communities of practice can also be conceived of as entities at work in historical processes (Pauketat 2013). At any particular moment, a community of practice is composed of layered generations, linked through shared technical experience which characterizes dispositions that define how they act as a community. At any time in the history of a community of practice, there is a point where there is complete generational overturn – yet through generational overlap, the community's practice is in part contextual to the collective experiences of ancestral generations (Figure 5). It can be assumed that for ancestral generations, the skill around which the community of practice is based intersected their lives in very different ways, specific to particular historical contingencies. For example, in the present, kayaking is practiced primarily
as a means of engaging heritage, where as 500 years ago it was a primary means of subsistence. However, intercorporeality is emergent in the practice itself – as an aspect of habitus it lends some degree of continuity to the patterns through which individuals respond in an impermanent environment that perpetually changes.

The concept of communities of practice can be merged with the concept of the longue durée – or the long term processes at work beneath the 'noise' of specific short and medium term events (Ames 1991; Brandel 1982; MacEachern 2013). Kayaking, for example, is a skill that Inuit have practiced in Greenland over a period that has seen many dramatic environmental and cultural changes between about 1250 A.D. and the present. When the first Thule migrants arrived, kayaking would have been an important aspect of how they first encountered the unique ecologies and geographies of Greenland. As Inuit became regionally diverse and locally specialized, kayak hunting was adapted to regionally specific subsistence practices. When Europeans began to colonize Greenland, bringing Christianity and new economic opportunities and power relations, kayaking continued to be practiced by Inuit, as a primary means of subsistence for some families up to the 1960s, and it continues into the present as means of exploring heritage. The value of the research question introduced in Chapter 1 becomes

![Generational chart of the kayaking community depicting overlapping personal experience through time. The point of generational change is always moving forwards as new generations are added to the community of practice, and old ones pass away. The figure depicts the point of generational change in the kayaking community from the perspective of the present.](image-url)
clear when directed at identifying the role of kayaking as a community of practice. The research question can be reframed here as "how has kayaking mediated the broader praxis of Inuit society in the long term?", or "to what extent has the practice of kayaking defined the way environmental and social changes were incorporated into Inuit society by the Inuit themselves?"

2.2.1 Studying Communities of Practice through Ethnoarchaeology

"Ethnoarchaeology is neither a theory nor a method, but a research strategy embodying a range of approaches to understanding the relationship of material culture to culture as a whole, both in the living context and as it enters the archaeological record, and to exploiting such understandings in order to inform archaeological concepts and to improve archaeological interpretation." (David & Kramer 2001:2)

In light of the above discussion, a key question is how archaeologists can better identify communities of practice in the archaeological record and position their agency in the narratives that we create about the processes through which the past unfolded. Ethnoarchaeology offers a strategy to accomplish this through analogical reasoning by conducting fieldwork that studies communities of practice in the present, in my case specifically exploring this relationship between enskilment and the broader social dynamics of a society (see also González-Ruibal et al. 2011; Wendrich 1999). As Wylie (1988; 1993; 1995) has effectively argued, analogy is inherently an aspect of archaeology as an inductive science. Wylie demonstrates that even where archaeologists are adamant that analogy has no place in interpretation, we actually depend on analogy in a similar way that Polanyi demonstrates we depend on tacit knowledge (e.g. Binford 1967). Where archaeologists imagine that they are able to work backwards in times through ethnographic correlates, using the 'direct historical approach', they are actually creating analogical inferences. However, this fundamental dependence on analogy does not reduce archaeology to speculative theorization. Wylie proposes strategies that archaeologists can use to strengthen analogies to scrutinize and be self-critical about the process through which we make inferences about the past. As an inductive science, there are ways for archaeologists to control and strengthen analogy.
Any analogical inference includes a source side (studied through ethnoarchaeological fieldwork) and a subject side (studied through the archaeological record) (Wylie 1985). Archaeological interpretation can be systematically improved through a type of analogy called 'relational analogy' which is dependent on the underlying structures that account for the similarities and differences in the source and subject side (see also David & Kramer 2001; Cunningham 2003; 2009; 2013). In the context of this dissertation, the research question proposed at the beginning of Chapter 1 about the role of kayaking and skilled practice in the longue durée of Inuit culture will be addressed in Chapter 8 through a relational analogy developed around the ethnoarchaeological observations about the physicality of the skill and the constitution of the community in the present. In the case of Greenland kayaking, where the community actually practices the skill as a means of exploring heritage, there are many opportunities for understanding the general phenomena of the skill itself, and to understand the agency of the community of practice through time. The relational basis for analogical inference, it will be argued, is in the physicality of the skill. Understanding the role of the physicality of kayaking in the constitution of the community in the present context allows interpretation of community dynamics of past Inuit communities who also participated similar processes of enskilment. The next five chapters will develop an ethnoarchaeological account of modern kayaking in a community of practice. The analogical potential will be discussed further in Chapter 4, which explores the history of modern kayaking in Greenland, and the application of ethnoarchaeological observations to the archaeological narrative of Inuit culture over the long term will be addressed in Chapter 8.
Chapter 3
Inuit Kayaking in Greenland Since the Thule Migration

In this ethnoarchaeological project, the objective of working with the modern kayaking community in Greenland is to better understand the position of kayaking in the longue durée of Inuit culture, as a practice that has had a causative role in the patterning of a unique and distinctively Inuit history. This chapter provides a background to kayaking by examining the skill in relation to key events in Greenland since the first ancestors of the Inuit arrived. The chapter is broken into two sections, which deal with the archaeology and ethnohistory of kayaking separately. The literature that this chapter summarizes is vast, and the intent is to examine the position of kayaking in three important processes: 1) the Thule migration and origins of Inuit culture, 2) the subsequent regional diversification of local Inuit groups, and 3) colonial interaction between Inuit and Europeans. Although this background is specifically focussed on developments within Greenland, broader trans-Arctic processes are also briefly summarized to establish context, especially in the archaeological section pertaining to the origins of Inuit culture. The chapter ends abruptly, because the history of kayaking is continued in Chapter 4, which provides an account of the decline of kayaking between the 1920s and 1970s, and the origins and development of the modern community. Additionally, Chapter 8 revisits the archaeological and ethnohistoric summary developed here, and re-interprets the position of kayaking through the analogy of the modern kayaking community.

3.1 Part 1: The Archaeology of Kayaking

3.1.1 Origins of Kayaking in the Bering Strait
'Kayak' is borrowed in English from 'qajaq' – the Inuktut word, which most Inuit⁵, and their close relatives, from Siberia to Greenland use to describe a closed-deck watercraft made from wood, sinew, and skin. Kayaks are usually made for a single hunter, and have an elongated and manoeuvrable hull designed for stalking and hunting a variety of animals with an array of weapons. Kayaking is one of many skills that were brought to the Eastern Arctic as a part of the Thule migration and has a long history of development in the Bering Strait region. Although the exact origins of kayaking are unclear, the earliest evidence consists of small ivory and bone model/toy kayaks recovered from archaeological sites in both Alaska and Siberia, indicating that kayaks, built and employed in similar ways to later Inuit examples, were used by the Okvik/Old Bering Sea culture about 2000 years ago (Arutiuonov et al. 1964:154; Chard 1955:165; Sergey et al. 1999: 365). Kayaks were also used by both Birnirk and Punuk cultures (the assumed ancestors of the Thule), as well as the contemporaneous Ipiutak culture, alongside larger open decked watercraft called 'umiaqs' for both hunting and transportation (Anichtchenko 2012; Larsen & Appelt 2001:46-48; Mason 2009; Stanford 1976; Whitridge 1999b). In several models/toys associated with Punuk culture, it can be seen that kayaks from the period likely had scalable cockpits and that hunting weapons such as the avataq hunting floats were used, suggesting hunting skills similar to those of their Inuit descendants (Collins 1932:115).

While the kayaks and umiaqs of circumpolar Inuit can be traced to this specific history of development in the Bering strait, it is important to note that there are other archaeological contexts in the Eastern Arctic where skin and driftwood frame watercraft were in use. Although the evidence is fragmentary and scattered between very large distances and times, it is apparent that at least some Palaeoeskimo groups also made skin and driftwood frame watercraft. For example, Saqqaq peoples used kayak-like watercraft, probably to hunt seals and waterfowl, as evidenced by structural fragments and patterns in the faunal assemblage of Qeqertasussuk – a uniquely well-preserved site in West Greenland that was occupied by 3900 B.P. (Gronnow 1994; 1996; 2012; Meldgaard 2004). Although it is difficult to imagine living in most parts of the Arctic without some form of watercraft for both hunting and transportation, the extent to which

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⁵ Almost all dialects of Inuktut and Yupik use the word 'qajaq'. One notable exception is East Greenlandic, where the word 'saqqiit' is used; however, this was a deliberate change related to a local and historically contingent practice in the late 1800s (Thalbitzer 1914).
Figure 6 Outline of timings and relationship between Arctic cultures referred to in text. Style of representation adapted from Whitridge (1999).

Watercraft were used by later Palaeoeskimo peoples is not clear. There are Inuit stories of the 'Tunit' (the Inuktitut word for Dorset) using kayaks, and early Norse accounts of 'Skraelings' suggest that the Late Dorset also used small kayak-like watercraft (Arima 1975; Mathiassen 1928b:57). However, other than a few possible fragments, and possible toys/models, there is
very little archaeological evidence (Lethbridge 1939:212-213; Mary-Rousselière 1979:25). In any case, there are no Palaeoeskimo contexts that provide sufficient data to interpret the construction and form of watercraft, or the skills through which they were used which could subsequently be compared with better known Inuit traditions. While there was certainly contact between the Thule and Dorset in the Eastern Arctic, it is assumed in this dissertation that watercraft used by the two groups represent different traditions (Appelt & Gulløv 2009; Friesen 2004).

3.1.1.1  The Thule Migration & Diversification of Local Inuit Groups

As with all circumpolar Inuit, Greenlandic Inuit trace their ancestry to the Thule migration – an event which originated in the Bering Strait and was characterized by a rapid movement of peoples into the Eastern Arctic about 1250 A.D. (Friesen & Arnold 2008). Exploring and eventually settling a region that stretches from Alaska to Greenland and Labrador, the Thule/ancestral Inuit migrants developed locally specialized subsistence strategies and networks of interaction (Figure 7). Through time, they became the many regionally diverse Inuit groups that populate the North American Arctic today. As hunting and transportation technologies, kayaks and umiaqs likely characterized many of the processes through which Thule experienced and developed knowledge about the new geographies and ecologies encountered in the Eastern Arctic. This section summarizes the current trans-Arctic archaeological synthesis on the nature and timing of the Thule migration in order to provide the necessary context to examine the material record of kayaking.

3.1.1.2  Thule Origins in the Bering Strait

Mason & Bowers (2009) nicely summarize Alaskan research on the Thule migration in the title of their paper "The Origin of Thule Culture is Always Elsewhere". Although the Thule migration is a very significant event in the prehistory of the Eastern Arctic, and it is almost axiomatic that it originated in the Bering Strait region, the exact origins, causation, and connection to ancestral Alaskan/Siberian groups is not well understood. Leading up to the onset
Figure 7 Inuit Origins and Diversification 1) The Thule migration originating in the Bering Strait, reaching locations as far away as Labrador and Greenland 2) Map of diverse contemporary Inuit groups descending from the Thule/Inuit transition. Also noted are Yupik and Aleut who also use kayaks and umiaqs but are more distantly related.
of the Thule migration, the cultural landscape of Alaska was complex and appears to have been a
melange of poly-ethnic communities characterized by warfare, population replacements,
competition for resource locales, and long distance trade networks (Ford 1959; Harrit 2004;
Mason 1998; 2009; Stanford 1976). Though it is generally accepted that the Thule developed
with strong influences from both Birnirk and Punuk, and potentially Ipiutak, it is difficult for
Alaskan archaeologists to pinpoint where this might have occurred as a discreet and local
cultural transition. Although closely related to both Punuk and Birnirk, there are a number of
distinctive archaeological patterns (including harpoon heads and house forms) which are
associated with Thule culture, and are interspersed with Birnirk and Punuk material culture from
Kotzebue Sounds to Point Hope. Yet the superposition of these is often difficult to interpret, and
most regional summaries conclude that Thule culture is something that moved into the area, not
developing in situ (Mason & Bowers 2009:25-26). Indeed, harpoon head types and house forms
identified by archaeologists as 'distinctly Punuk', or 'distinctly Birnirk' show up in archaeological
contexts as far away as Greenland – in some models, this has been taken to suggest that the
Thule migration occurred in discreet waves with separate origins, and that the distinctiveness of
some Inuit groups originates with particular ethnic affiliations in the Bering Strait (Gulløv 1997;
Schledermann & McCullough 1980). In terms of Greenlandic kayaks, it has been proposed that
there would have, at one time, been several traditions in Greenland that trace their origins to
either Birnirk or Punuk (e.g. Golden 2006; Heath & Arima 2004; Gulløv 1997).

A point relevant to this thesis and understanding Thule Inuit as a community of practice,
is that there may be no distinct origins as such. If the ethnographies of later Alaskan groups are a
fair analogy (e.g. Burch 2005), the cultural landscape of the Bering Strait leading up to the Thule
migration may have been characterized by long standing blood feuds, territorial disputes, and
limited social mobility. There may have been plenty of reasons for a variety of individuals to
leave (Mason 1998; 2009). Rather than a single homogenous cultural group that developed
somewhere in Alaska and then moved into the Eastern Arctic, Thule culture may be something
that developed through the process of migrations. The first groups of Thule migrants may have
been a heterogeneous amalgamation of individuals with complex and mixed ancestry, who were
united in a shared intention of never returning to the places they were born and raised, were not
wedded to a particular heritage, and were ready to explore new opportunities and settle new
places. In any case, heavy erosion along the North Slope of Alaska contributes to a virtual
deletion of Early Thule sites associated with the migration, obscuring the development of Thule Inuit between Point Barrow and the gateway to the Eastern Arctic (Jensen 2009).

3.1.1.3 The Thule Migration in the Eastern Arctic

In contrast to the Bering Strait and North Slope of Alaska, the earliest appearance of Thule Inuit migrants in the Eastern Arctic is pronounced and spread over a very large region from the Mackenzie Delta/Amundsen Gulf, to Baffin Island and North Greenland; it is characterized by distinctive house forms, broad subsistence strategies, and a suite of tools/stylistic traits quite different from Late Dorset Palaeoeskimos (Friesen 2009; Gulløv 1997; McCullough 1989; Morrison 2009). Bowhead whale hunting was particularly important to the Thule migrants; they lived in distinctive semi-subterranean whalebone houses across much of their range, and often incised whale hunting scenes involving kayaks and umiaqs on their tools (McCartney 1980; Savelle & Habu 2004). In Thule Inuit communities, whale hunts were likely carefully organized events timed in conjunction with community aggregations to amass large numbers of hunters to act as whaling crew and to distribute the labour of processing a whale once caught (McCartney 1980; 1985; Savelle & McCartney 1999; Whitridge 1999a). Although whale hunts were probably an important structuring aspect of community social relations, the extent to which whaling contributed to subsistence is unclear, though in at least some cases it must have been important (Coltrain et al. 2004; Savelle & McCartney 1999). Thule Inuit also had a very broad subsistence base which depended on hunting a variety of animals with kayaks; this included seals, both in the summer, and at open water polynyas and the ice-floe edge in the winter (Morrison 1983; Park 1999). In addition, Thule are assumed to have used kayaks to hunt caribou, waterfowl, and smaller whales. Across the Eastern Arctic, the transition from Thule Inuit into distinct Recent Inuit groups was a locally contingent and variable process. Most Inuit in the Eastern Arctic became less focused on Bowhead whale hunting, and with a few

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6 In the archaeology of the Eastern Arctic, several sub-divisions of Thule commonly cited in the literature, including 'Classic Thule', 'Early Thule', 'Pioneering Thule', and 'Ruins Island Thule', and the later 'Modified Thule' (Friesen & Arnold 2008:537). For the sake of brevity in this dissertation, and in accordance with the re-dating of the Thule migration (discussed below), I have conflated these to 'Thule Inuit', for sites associated with the early migration and settlement and 'Recent Inuit', where the beginnings of regional diversification and distinctiveness can be identified.
exceptions, began to favour subsistence patterns that were highly mobile and specialized in regionally specific seasonal events and ecological patterns (Betts & Friesen 2004; Park 1999; Stewart et al. 2004; Whitridge 2012).

One of the most important recent developments in Eastern Arctic research – which has direct implications for understanding Greenlandic archaeology – is the re-assessment of the techniques through which the Thule migration has been dated. Until recently, it was assumed that the Thule migration took place over a period which in some accounts stretched from 900 – 1400 A.D.; as a process that spanned several centuries, the Thule migration likely consisted of successive waves of migrants with different Bering Strait cultural affiliations, and could be explained through slow paced mono-causal models based on climate change or cultural contact (e.g. McGhee 1984, 1994; Taylor 1963:456). However, many of the dates through which the Thule migration was assessed were taken from materials not suitable for carbon dating, such as sea-mammal bone and driftwood (McGhee 2000; Nelson & McGhee 2001). This has provoked a number of recent papers that collectively examine the entirety of dates that the Thule migration has been based on, showing that even the earlies: Thule occupations of the Eastern Arctic could not have been earlier than around 1200 A.D., as much as 300 years later than previously assumed (Friesen & Arnold 2008; Friesen 2009; McGhee 2009a; Morrison 2009).

Specific implications demonstrated by Friesen & Arnold (2008) are that the initial migration into the Eastern Arctic may have occurred in as short a time period as several decades, and that for some areas the subsequent development into the diverse Inuit societies that populate the Arctic today was a process that happened over a relatively brief 150-200 year period. The conflation of the earliest Thule sites into a very short time period, and the apparent similarities between them seem to indicate that the Thule migration was either a single event or a “tight series of linked migrations” (Friesen & Arnold 2008:537). This raises the likelihood that the dynamic cultural changes and regionalization of the Thule/Inuit transition happened at a pace that was observable within the lifetimes of individuals. The discovery of local environmental knowledge, such as the routes of animal movements or the timings of seasonal events, and the reinvention of hunting techniques brought from the Bering Strait, must have been processes that Thule Inuit consciously participated in. The reasons for why the Thule migration occurred have long been a key debate in arctic archaeology, but re-assessment of the timing opens many new questions about how it occurred (Friesen 2011; Jensen 2012; Rankin et al. 2012). Furthermore,
as the dates for the Thule migration have been pushed to a later period, so too have the dates for
the terminal phase of the Dorset, suggesting that some overlap occurred (Appelt & Gulløv 2009;
Friesen 2004).

3.1.1.4 The Thule Migration/Inuit Diversification in Greenland

The Thule migration and subsequent development of local Inuit groups in Greenland
evidently followed several trajectories, resulting in three distinct Inuit groups – the Kalaallit of
West Greenland, the Inughuit of Northwest Greenland, and the Tunumiit of East Greenland. The
interior of Greenland is covered by ice, and the only habitable/navigable parts of Greenland are a
thin band of coast and fjord systems. For Thule migrants moving into Greenland from Ellesmere
Island, the options were to go South or North (Gulløv 1997; Holtved 1944; Mathiassen 1930;
1933; Sørensen 2010; Sørensen & Gulløv 2012). When the Thule Inuit arrived in Greenland,
there were already Late Dorset and Norse living in several parts and there was evidently
interaction between these groups, although the extent of this beyond trade is not well understood
(Appelt & Gulløv 2009; Mathiassen 1930). Despite geographical separation, developments in
both East, Northwest, and West Greenland are unlikely to have happened in complete isolation
from each other. Indeed, there are later ethnographic accounts of trade, travel, and intermarriage
between these regions, as well as subtle archaeological hints at continued movements between
Northeast and Northwest Greenland, and eventually East and West Greenland (Gulløv 1997;
Jensen 2002; Mathiassen 1928a; Sørensen & Gulløv 2012). However, marked cultural and
linguistic differences between Inughuit, Kalaallit, and Tunumiit seem to be the result of regional
developments and local historical contingencies.

In circumpolar terms of the diverse geographical and ecological areas that the Thule
migrants settled, West Greenland is particularly unique in that many parts of the coast are ice-
free all year, and the area has a rich ecology characterized by complex fjord systems. The
transition between Thule and Inuit in West Greenland is also fairly unique; even the earliest
Thule migrants in West Greenland seem distinct from elsewhere in Greenland, and are referred
to as the 'Inussuk culture' after Mathiassen's (1930) excavation of the Inugsuk site (Gulløv 1997).
The Inussuk traded with the Norse until the Norse disappeared by the mid-1400s, and even at the
earliest stages did not live in the characteristic Thule whalebone houses seen elsewhere in the
Arctic. Through time their settlements became semi-permanent, and by the 1500s, Kalaallit Inuit were living in larger communal houses (Gulløv 1997). The Inussuk/Kalaallit travelled during the summer in kayaks and umiaks, moving further into the fjords to hunt caribou, or to large aggregations associated with trade and whale hunting. However, they did not have the high degree of residential mobility seen in the Central Arctic. The Inussuk/Kalaallit were almost entirely dependent on kayaks for hunting and fishing, especially those living south of the seasonal ice floe. Inussuk/Kalaallit year-round subsistence was characterized by daily kayak hunting forays in the fjords or open ocean and was based primarily on seals, but also included waterfowl, caribou, varieties of fish, Greenlandic shark (for dog feed), occasionally larger whales, and in some areas walrus, narwhal, and beluga (Gulløv 1997). Even in the northern parts of West Greenland, such as Disko Bay to Upernavik, where sea-ice does form, winter hunting techniques were primarily based on using kayaks at the edge of the ice floe (Birket-Smith 1924).

The Thule/Inuit transition is different in Northwest and East Greenland. The Thule that settled in the Qanaaq/Inglefield Land area in northern Greenland co-existed with Late Dorset until the latter's disappearance. There seems to have been a movement of people between Northwest Greenland and Northeast Greenland and the two populations were initially fairly closely linked (Holtved 1944; Jensen 2009; Sørensen & Gulløv 2012; Darwent et al. 2009). The Tunumiit of East Greenland trace their ancestry to Inuit living in the Northeast Greenland, who abandoned the area by the mid-1800s, moving further south along the coast to the Ammassalik/Tasiilaq area. In the early historic period, the Inuguit (Polar Inuit) of North Greenland went through a period of disease and famine and nearly disappeared. Much of their distinctive material culture is thought to have been reintroduced during an event called the Qitdlarsuaq migration, which saw the movement of Ighulik Inuit from Baffin Island in the mid-late 1800s (Holtved 1967; Mary-Rousselière 1951; Rasmussen 1908; 1920; Van Stone 1972).

The emerging consensus on the timing of the Thule migration, as tightly linked events that likely happened over several decades after about 1250 A.D. has a number of implications for understanding the Thule/Inuit transition in Greenland. Models of the Greenlandic Thule/Inuit have traditionally been focussed on explaining the cultural and linguistic differences between East and West Greenland, and it is often proposed that these represent discrete waves of migration that originated outside of Greenland. For example, based on house forms and harpoon head types, Gulløv (1997) links the origins of the Inussuk Thule to an earlier migration of
Bimirk from Alaska about 1000 A.D., and the Thule that settled Northeast and Northwest Greenland to a later migration of Punuk via Ellesmere Island after 1300 A.D. (McCullough 1989), building on a model originally proposed by Holtved (1944). However, at present, every instance of Thule dates earlier than 1200 A.D. has been refuted in the Canadian Arctic. Given the new dates of the Thule migration, it is entirely possible that some of the first Thule Inuit to settle in Greenland were born in Alaska, or at least had spent the entirety of their lives as migrants consciously exploring opportunities and looking for new places to permanently settle. From this perspective it seems likely that the Thule/Inuit transition in all parts of Greenland is reflective of rapid indigenous developments.

3.1.2 The Material Record of Kayaking (from Thule to Inuit)

Kayaks are understood to have been an important aspect of subsistence and transportation throughout the Thule/Inuit transition in all parts of the Eastern Arctic. However, being constructed primarily from driftwood, sinew, and skin, kayaks do not preserve well, and their survival in the archaeological record is sparse. The taphonomic processes at work on kayaks are apparent through observing examples preserved in the ethnographic collections of museums. Unless carefully preserved, the skin covering of a kayak dries and shrinks as it ages, eventually crushing the wood frame. As the skin and sinew cordage rots away (or is scavenged), broken pieces of the frame become exposed and quickly decay. As a result, the importance of kayaks in the Thule migration and Thule/Inuit transition must be studied inferentially through fragments of kayaks and material patterns associated with their use. This section examines the different archaeological contexts of material evidence for kayaking across the Eastern Arctic, followed by a discussion of the position of kayaking in Inuit origins.

3.1.2.1 Fragments of Kayaks – Structural Elements and Deck Pieces

There are no examples anywhere in the Arctic, where whole kayaks have been recovered in an archaeological context. Indeed, there are very few cases where a complete kayak can be assumed to have been deposited in the archaeological record. Even in those examples,
Figure 8 Fragments of the Morris Bay kayak and associated equipment (see Mathiassen 1928a). 1) Ivory pieces from deck straps (L.9429 L. 9431, L.9432 & L.9433) 2) Whale bone protective edging for the keel (L. 9434) 3) Ivory mouthpiece for an avataq hunting bladder (L.9412) 4) Caribou antler kayak scraper for removing ice from the deck. (L.9423) 5) Two fragments of apummat (gunwales) (L.9446). Photos courtesy of the Greenland National Museum.

preservation is usually limited to a few wood fragments from the frame (Figure 8 – 5). Such instances include cases where kayaks were a part of a burial (Grummesgaard-Nielsen 1997;
Petersen 1986:56). It is apparent in ethnohistoric accounts that placing a dead person's kayak on their grave was a burial technique traditionally practiced by Inuit across the Arctic (Birket-Smith 1924: 266; Osborne 1952). However, as Crass (2001:114) notes, wood from kayaks at burials would have been appealing for use as firewood (both by Inuit and Europeans), and, particularly in parts of the Arctic where driftwood is very rare, there is some suggestion a kayak could be replaced by a model kayak if the wood was needed. Occasionally, there are also archaeological contexts where complete kayaks were likely cached for seasonal use, and then presumably never recovered (Stewart et al. 2000:264; Mathiassen 1928a). Kayak fragments are also recovered at residential sites, especially ones that were occupied continually such as those in West Greenland, where deposition is likely to have occurred as a part of construction and maintenance activities (e.g. Gulløv 1997). Fragments of kayaks are occasionally recovered from Thule period sites, but these are very rare (Holtved 1944:230-231; Park 1983:39).

If properly identified, and compared to the general operational sequence of how kayaks are made (outlined in detail in Chapter 5), even small structural fragments can sometimes reveal important information about the shape and dimensions of past kayaks (Walls 2012b). Kayak fragments also offer a glimpse into the importance and value of wood suitable for construction. Many kayak fragments recovered from archaeological contexts display evidence of repeated modification and adjustment (Walls 2012b: 56). This indicates that kayaks were repeatedly modified, and that some structural pieces were likely recycled and incorporated into new kayaks, perhaps contributing to the under-representation kayak fragments in the archaeological record.

Aside from structural elements, the most likely pieces of a kayak to be preserved in archaeological contexts are carved antler, bone, and ivory pieces used as protective edgings, or tighteners for deck straps (Figure 8 – 1&2). It can be seen archaeologically that these were often highly variable in their forms, and in some cases could be highly ornate. Through ethnohistoric sources, it is clear that decorated pieces could simultaneously function as protective amulets, a point discussed in more detail later in this chapter. Tighteners and pieces associated with lines are common in both Thule and Inuit archaeological contexts, but they reveal little about the kayaks themselves of which they formed part. In many cases, tighteners for kayak straps are difficult to distinguish from those associated with other line-based equipment such as tracings for
Figure 9 Examples of artifacts associated with kayaks from the Inugsuk site in West Greenland. 1) A wound plug (L4.2794) 2) Three examples of toy/model kayaks (L4.4444, L4.4822 & L.4821). Photos courtesy of the Greenland National Museum.

sled dog harnesses. Buckles for kayak straps, or for the *tulik* (a sealskin jacket worn by kayakers, which seals the cockpit), are easily mistaken for very similar pieces involved in other types of clothing and equipment (Birks-Smith 1924:122; McGhee 1977:144).

3.1.2.2 Antler/Bone/Ivory/Wood Pieces from Associated Equipment

Kayaks are often represented through pieces of equipment that are diagnostic of kayaking. For example, pieces of double-bladed paddles or bone protective edgings from paddles are sometimes found in early Thule contexts (Maxwell 1983; Gulløv 1997). ‘Kayak scrapers’ are another diagnostic tool, usually consisting of a short caribou antler beating tools with a well defined handle (Figure 8–4). These characteristic scrapers were used to remove ice that builds up on the deck of the kayak in freezing conditions. They are found in a variety of Thule/Inuit contexts and can also be traced to Birnirk/Punuk cultures (Birks-Smith 1924:49; VanStone 1989:17).

Thule and Inuit assemblages often contain other artefact types that are strongly associated with kayak hunting, or kayaking related activities such as construction and maintenance, but are not necessarily diagnostic. For example, harpoon heads, bird dart prongs, mouth pieces from
*avataq* hunting floats, which are all commonly found in Thule/Inuit sites can also be used in other hunting techniques such as winter breathing hole sealing, or *umiaq* based whale hunting (Figure 8 – 3). 'Wound plugs' or 'wound pins' are also commonly represented in artefact assemblages across the Arctic, and they are usually associated with open water seal hunting from kayaks. Kayak hunters usually have to tow their prey once caught, and to prevent their catch from bleeding out or filling with water, kayak hunters plug the wounds inflicted by their harpoon or lance with pins made from antler/bone/ivory/wood (Figure 9 – 1). Wound plugs are found in both Thule and Inuit sites, often in association with burial contexts (Bowers 2006; Crass 2000:73; Morrison 1981; Sabo & Jacobs 1980). Mason (2009) notes that in the Alaskan sequences, wound plugs are thought to be an innovation developed through Birnirk/Punuk/Thule cultures. More broadly, there is an array of carpentry and sewing tools, which among many other daily tasks would have been used in construction and maintenance activities. While on their own these artefact classes are not necessarily diagnostic of kayaking, when compared to other patterns in assemblages, they can be informative of the techniques through which kayaks were built and used, as well as the centrality of kayaking in daily life (Walls 2012b).

### 3.1.2.3 Model/Toy Kayaks

As previously noted, the earliest archaeological evidence of kayaks consists of miniature models or toys, carved out of bone, ivory, or wood. Miniature models of animals and hunting equipment, including kayaks, are also one of the most common artefact types found in a variety of archaeological contexts for both Thule and Inuit sites across the Arctic (Arima 1975; Gulløv 1997; Lethbridge 1939:192; McCartney 1977; Park 1983:156, 260; Stanford 1976; Thomsen 1917:460). Model kayaks can range anywhere from simple diamond shaped wood pieces, to very intricately worked bone or ivory miniatures complete with kayakers and deck equipment. In some cases, operational and performance aspects of the kayaks they represent can be inferred from the details included in the miniature, including types of hunting equipment or subtleties in shape of the hull (Arima 1994; Golden 2006). Ethnohistoric accounts of circumpolar Inuit suggest that kayak miniatures had several functions and could variously be used as toys for children, models to illustrate accounts of hunting, protective amulets, or substitutes for full kayaks as a grave good in burials (Birket Smith 1924:277; Rasmussen 1931:263).
3.1.2.4 Depictions in Hunting Scenes

Kayaks also figure prominently in artistic depictions of hunting scenes incised on ivory bow drill handles, snow knife handles, and other tools – both those associated with early Thule migrants, and with later Inuit (McCartney 1980:522-524; Whitridge 1999). Especially in Thule Inuit examples, the most vivid scenes often depict bowhead whale hunts, very clearly involving both kayaks and umiaks participating in coordinated hunting techniques, often showing hunters in the act of throwing harpoons attached to avataq floats. Other scenes depict kayakers lancing caribou at river and lake crossings (Maxwell 1983; Savelle & Habu 2004: 207). Decorated tools were likely personal items, and most archaeological examples are recovered in the context of burials (Mary-Rousselière 1960; Maxwell 1983).

3.1.2.5 Stone Features Associated with Kayaking

There is also a variety of stone features often found at Thule and Inuit archaeological sites that are associated with kayaking and are linked to kayak storage, training activities, or caribou hunting techniques. Particularly common are the simple 'kayak stands' or 'kayak rests', found in close association with residential sites throughout the Eastern Arctic (Darwent et al. 2007:57; Grønnow 1986:66; Lethbridge 1939:224; Mathiassen 1928b; Schledermann 1971:69; Stenton 1987; Stenton & Rigby 1995:49). These generally consist of a simple configuration of stones set up to support the kayak at the bow and stern and keep it up off the ground to protect the skin covering. In some cases there are early Thule examples that are made from bowhead whalebone (Savelle 1997). Another type of storage feature includes storage pits, where kayak frames can be cached seasonally – these are elongated depressions that would have been covered with stones, protecting the frame from the elements (Bennett & Rowley 2004:253; David 1999:137).

Stones arranged to outline the shape of a kayak are also a common type of feature found at both Thule and Inuit sites throughout the Eastern Arctic – usually in close association with domestic architecture (Figure 10) (Boas 1888: 549; Felbo et al. 1993:31; Henderson 1997; Nooter 1991: 338; Pinard 1999:41; Schledermann 1971:66) While there is a variety of forms,
such outlines generally approximate the actual size of a kayak, and have dimensions that permit an individual to physically sit inside them. Through both the oral history of living Inuit communities and ethnographic accounts, kayak outlines can be linked to harpoon throwing games (Birket-Smith 1929; Henderson 1997). I have argued elsewhere that these were an important aspect of enskilment – the games that were played through the kayak outlines simulate actual hunting scenarios where specific techniques are used (Walls 2012a).

A third type of stone feature associated with kayaking consists of small cairns and Inuksuit arranged into drive lanes to help direct herds of caribou towards key river and lake crossings where kayakers are waiting to lance them as they swim across. Caribou float once killed, and the kayakers can lance many at once, which are then towed and butchered on the shoreline. The technique was likely brought to the Eastern Arctic from Alaska and was practiced by a variety of Inuit groups from Northern Alaska to the Central Arctic, and Greenland (Balikci; 1970; Binford 1991; Birket-Smith 1929; Henderson 2004; Keith 2004; Grønnov 1991; Maxwell 1983; Stewart et al 2004). The strategy requires group coordination, with some people on land to help herd caribou through the drive lanes, and to split the labour of butchering, drying meat, and preparing hides. 7 In the Kivalliq district of Nunavut, this technique was often practiced in conjunction with large social gatherings timed to intercept the Fall migration of caribou, and to prepare and cache as much caribou as possible for the winter.

### 3.1.2.6 Patterns in Faunal Assemblages

Although it remains an underexplored topic, patterns in faunal assemblages of Thule and Inuit sites can also provide inferential knowledge about kayak hunting techniques. For example, by determining the seasonality of ringed seal hunting by Early Thule at the Clachan site in the Coronation Gulf, and comparing that data to harpoon head types in the assemblage, Morrison (1983:70-71) notes that Early Thule hunting seemed to be highly dependent on open-water seal hunting from kayaks, both in the summer and at the ice-edge in the winter. By noting changes in

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7 The technique is very well illustrated in the 'At the Caribou Crossing' segment of the National Film Board of Canada's 'Netsilik Film Series'.
this pattern through time, he observes that the local Thule/Inuit transition was marked by an increasing dependence on winter hunting at breathing holes and that kayak hunting was a practice that became limited to a few months in the summer. Similarly, Park (1983; 1999) also links seasonality of seal hunting (and implied open-water strategies) to a transition in the dependence of Early Thule on kayak hunting to breathing hole sealing in the Central Arctic.

Throughout the eastern Arctic, zooarchaeological analyses demonstrate localized specialization and regionalization of subsistence patterns as a key feature of the Thule/Inuit transition. In terms of the general trend, it seems that the initial Thule migrants were at first strongly dependent on kayak hunting of seals, walrus, bowhead whales, waterfowl, and caribou. Most Inuit descendant groups retained kayaks as an important aspect of subsistence, but the techniques and seasonality of use became very regionally specific. For example, in many areas Inuit developed highly mobile subsistence strategies, and kayak hunting was confined to summer months, often practiced in association with specific seasonal events such as beluga or caribou migrations (Arima 1975; Balikci 1970; Betts & Friesen 2004; Friesen 1999:27). In contrast, Kalaallit Inuit in west Greenland increased dependency on year-round open-water seal hunting (Gulløv 1997).
3.1.2.7 Pathologies on Inuit Skeletal Material

A point that will be explored in more detail in Chapter 6 is that kayak hunting involves a high degree of developed fitness. Merbs and Hawkey (1995) demonstrate that kayaking associated fitness can be identified through musculoskeletal stress markers (MSM) on skeletal materials. In an assemblage compiled from both Thule and Inuit graves, they identify patterns in hypertrophy of bone related to the increased blood flow associated with muscle build up and stress, which they link to specific kayaking activities such as rotational paddling, and harpooning. Kayaking related MSMs are particularly visible in upper extremity bones (clavicles, scapulae, humeri, radii, ulnae), and even include a particular stress lesion that Merbs & Hawkey (1995:334) refer to as 'kayaker's clavicle'. By comparing skeletal materials from both males and females of the early Thule and later Inuit time periods, they note gender-specific activity induced patterns, indicating that kayaking was a predominantly male activity in both time periods, a pattern also prevalent in the ethnohistory of circumpolar Inuit. They also note changes in activity-induced stress lesions through time, proposing that kayaking decreased over the course of the Thule/Inuit transition – at least for their area of study in northwest Hudson Bay. Although Merbs & Hawkey (1995:334) briefly mention the possibility of training as contributing to MSMs, they tend to associate them directly with the practice of kayaking. It will be seen in chapter 6 that it is very likely that activity-induced MSMs could be as much indicative of training and conditioning as actual use.

3.1.3 Overview of Archaeological Evidence and the Position of Kayaking in the Thule/Inuit Transition

Although the material record of kayaking is fragmentary, a composite image can be assembled from these different lines of evidence, which demonstrates that kayaks were a very important part of daily life throughout the Thule migration and subsequent diversification of local Inuit groups. Kayaks were an important part of childhood, as evidenced by the toys/models and stone outlines associated with kayak games. Kayaks were also an important feature of ritual life, and aside from the amulets and decorated pieces often incorporated into the design,
individuals were often buried with kayaks, models of kayaks, or equipment associated with kayaking.

For the Thule migrants, it is difficult to determine what the kayaks they brought with them from the Bering Strait would have looked like. Structural fragments would suggest that they shared the same internal components as later Inuit kayaks, but there is not enough to suggest performance characteristics or a definitive style. Indeed, there is a possibility that within groups of Thule migrants arriving in the eastern Arctic, there may have been individuals with distinct cultural backgrounds who had experience with different kayak building traditions and hunting techniques in the Bering Strait; there may not have been an archetypal Thule kayak form. Although the kayaks themselves are not preserved, there is much evidence to suggest that the Thule Inuit were highly skilled kayakers, and that kayaking prowess may have even been an important aspect of how communities were structured. Kayaks were used in coordination with umiaks in bowhead whale hunting, as depicted in incised images on tool handles, which are often included in burials. Kayaks were used throughout the year to hunt a very wide range of animals in what must have been a variety of conditions. Thule kayakers likely hunted with an array of weapons, also used by later Inuit descendants, including bird darts, lances, harpoons with hunting floats, and bladder darts.

As local distinctiveness of descendant communities emerged during the Thule/Inuit transition, Inuit across the Arctic became more specialized, adapting knowledge and skills brought from the Bering Strait to new geographies and ecological patterns. As a part of the regional diversification, kayaks remained an important subsistence and transportation technology, but for most Inuit groups, the emphasis of the technology as the primary means of subsistence shifted, and kayaking generally became confined to a few months of use in the summer. In west Greenland however, the pattern is very different. Due in part to large ice free areas of the southwest coast, the Inussuk/Kalaallit Inuit were dependent on year-round open water, perhaps to an even greater degree than their Thule ancestors had been. From a very early period Inussuk/Kalaallit Inuit lived in semi-sedentary communities and their subsistence depended almost entirely on kayaking. Kayakers in Greenland used their kayaks to hunt in all seasons.

There are several archaeological contexts in Greenland where significant portions of a kayak frame are preserved, which date to a very early time period. Most notably there is the
Morris Bay kayak, discovered by Lauge Koch in Washington Land in 1922 (Figure 8) (Koch 1926 & Mathiassen 1928a), and the Eqalulik kayak discovered by H.C. Petersen (1986) near Sisimiut. Both examples likely predate European contact in the 1500s, though their exact age is uncertain. These kayaks appear to have been cached or perhaps buried to commemorate their deceased owners. They each include a full suite of hunting weapons, along with enough fragments to infer aspects of their design and performance characteristics. In comparing these early examples to the ethnohistory of kayaking in Greenland, it can be seen that a distinctive tradition of kayaking, involving high performance designs and personalization of equipment, was present in Greenland, from very early in the origins of Inussuk/Kalaallit culture in West Greenland.

3.2 Part 2: The Colonial Period and Ethnohistoric Accounts of Kayaking

In contrast to the archaeological record where evidence of kayaking is often fragmentary, detailed accounts of kayaking proliferate in the ethnohistory of circumpolar Inuit, starting with the very earliest encounters between Inuit and Europeans. For example, during Martin Frobisher’s 1577 expedition to Baffin Island, which involved several violent interactions with Inuit (at one point resulting in Frobisher being shot with an arrow in the buttocks), he kidnapped three Inuit to take back to England, including a kayaker whom he lured to the ship and plucked out of the water. The kayaker was taken to Bristol where he performed several demonstrations before dying shortly thereafter (Cheshire et al. 1980; McGhee 2001; Oswalt 1999:30; Sturtevant & Quinn 1989). Throughout the colonial period, kayaks were a source of fascination for Europeans, and there are many accounts from early explorers, missionaries, traders, and eventually ethnographers which included detailed descriptions of kayaks, kayaking skills, and the importance of the technology in daily life (Kleivan 2002). Kayaking also figures very prominently in Inuit oral history, and the cultural importance of the skill is well documented in early Indigenous literature and art (Oman 1995; Bennett & Rowley 2004; Petrone 1992:103; Petersen 1986).
It is apparent from ethnohistorical accounts that kayaks were an important point of cultural continuity for all circumpolar Inuit; with only a few exceptional cases, kayaking continued to be practiced by all Inuit descendants of the Thule migration. In many cases, kayaks continued to be used through much of the colonial period. Kayaks from Siberia to Greenland were built in very similar ways, and there is continuity in terminology for very specific structural parts of the frame in Inuktut dialects and even distantly related Yupik (Table 2). Kayaking was an important aspect of childhood across the Arctic, and enfkilst marked stages increasing importance and connection within the community (Nuttall 2000). There were many games associated with learning to kayak (Boas 1907:485; Hendersen 1997). As with many technical skills associated with Inuit and their close relatives (see Frink et al. 2003; Frink 2009; Jarvenpa & Brumbach 2006), there is also continuity in the way that different genders participated in kayaking. Kayak hunting and the carpentry involved in construction were predominantly male activities (although there are exceptions to this generalization), but across the Arctic, kayak hunting success was also dependent on the knowledge, experience, and skill of women who prepared and sewed the skin covering, often placing protective amulets in the kayak as it was scwn (Boas 1907:470-479; Thulbitzer 1914).

Kayaking also figures very prominently in Inuit narratives of shared origins, as seen in the story of Kiviuq — a hero epic told in similar versions from Siberia to Greenland (Petrone 1992:44). Kiviuq is the first Inuk; in Kalaallisut (West Greenlandic) he is called 'Qooqa,' and the Inupiat in Alaska even call him 'Qayaq,' which is short for his full name 'Qayaqtuagaqniqtuq' —

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8 A well-known exception is the Inughuit of Northwest Greenland, who for historically specific reasons (likely involving an episode of mass starvation and illness) had apparently lost the skill of kayaking by the mid 1800s. Kayaks were re-introduced through the 'Qidlarstuaq migration' from Baffin Island, which by some accounts was motivated by the desire to bring kayaking and other Inuit technologies back to the Inughuit (Gilberg 1974; Mary-Rousseliere 1991; Rasmussen 1908; Van Stone 1972:208-210). By the 1960s, the Inughuit were using West Greenland style kayaks introduced from the south (Holtved 1967).

9 www.unikpa.ca is a good resource for Kiviuq stories: it is a website made in conjunction with John Housten's 2004 film 'Kiviuq', with the support of the Kitikmeot Heritage Society, and it compiles Kiviuq stories told by Elders across Nunavut.
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<td>Caranaq</td>
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</tr>
</tbody>
</table>

meaning 'forever riding a kayak' (Oman 1995; Van Deusen 2009). As a boy, Kiviuk was expelled from his home and sent to wander the world in his kayak, facing dangers, visiting strange lands, and encountering new people. Across the Arctic, there are many places that are associated with different parts of Kiviuk stories; for example, near Arviat in Nunavut, there is a place where two small depressions in a rock near the coast are said to have been made by Kiviuk's mother who stood for years waiting for him to come home in his kayak (Henderson 1997).

While kayaks are iconic in their symbolic association with Inuit cultural continuity, they are also an important point of local variation. As a part of diversification after the Thule migration, most Inuit groups developed locally specific subsistence patterns and hunting techniques. In conjunction with these subsistence strategies, there are very distinctive styles of kayaks that are found throughout the Arctic, often associated with different regions or ethnic groups. The different types have been well outlined in several publications, but in general most kayaks seem to have been designed for locally specific hunting techniques.\(^\text{10}\). While kayaking remained an important aspect of broader subsistence for most Inuit groups in the Eastern Arctic, its position is generally quite different than the dependence on open-water hunting characteristic of the Thule migration. Although bowhead whale hunting was occasionally practiced in some areas, it did not have the same degree of social or economic prominence that it likely had for the

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\(^{10}\) I've avoided summarizing the circumpolar variability in kayak types as my focus in this dissertation is on construction practices in West Greenland. However, very good accounts of regional variability can be found in Adney & Chapelle 1964; Arima 1975; 1987; 1990; 1991; Golden 2006; Heath & Arima 2004.
Thule migrants (Hawkes 1914; Taylor 1988). Within the many locally specialized types of kayaks and hunting techniques found across the Arctic, Greenlandic kayaking (and particularly West Greenlandic) is distinctive in the high degree of skill involved in its use. As previously mentioned, whereas most Inuit in the eastern Arctic used kayaks for a small part of the year, dependency on kayak hunting in Greenland was nearly year round.

3.2.1 The Ethnohistory of Kayaking in Greenland

Greenland has a particularly detailed ethnohistory, developed through nearly 450 years of sustained interaction with Europeans (aside from Norse). Indeed, as outlined in Figure 11, the greater part of Inuit kayaking in Greenland, from the Thule migration in the 13th century to the present, has taken place during the colonial period. Between various sources, there is a very rich account of kayaking from the late 1500s to the 1960s, with vivid depictions of the dynamics of the skill, the centrality of the practice in daily life, and how kayaking was a defining aspect of interaction between Inuit and Europeans. This section starts by summarizing the types of ethnohistoric sources. From these, distinctive aspects of Greenlandic kayaking techniques are highlighted, which can also be recognized in the earliest archaeological signatures of kayaking in Greenland. The dangers of kayaking, its impact on the demographics of Inuit communities, and the centrality of skill in social and ritual life are assessed in turn. The section concludes with an overview of the role of kayaking in shaping interactions between Inuit and Europeans.

3.2.1.1 Ethnohistoric Accounts and Kayak Collections – 1586 A.D. to Present

The earliest contact between Greenlandic Inuit and Europeans after the disappearance of the Norse in the mid-1400s probably consisted of unrecorded encounters with Flemish and Breton sailors in the mid-1500s; the earliest written account by Frobisher hints that there was already some degree of trade as evidenced by Inuit possessing items such as iron nails (Gullov 1988). Beginning with John Davis' expedition, the earliest accounts of kayaking are from the late 1500s to the mid-1600s, when a large number of expeditions came into regular contact with Inuit
Figure 11 General chronology of significant events and ethnohistoric sources referred to in text

on the west coast of Greenland, leading up to the establishment of regular Dutch & Scandinavian whaling voyages in the late 1600s. There are several key accounts of kayaking during this time, which describe kayak skills and hunting techniques – Olearius, for example, notes from second
hand sources that Greenlandic kayakers had the ability to roll once capsized (Gad 1971:246; Scheffer 1987:708). The first European colonial settlements in Greenland emerged as a network of missions and trading posts that stretched from South Greenland to Upernavik between 1721 and 1800. With the development of early governance of Greenland, and with Europeans and Inuit living in close proximity, there are many detailed accounts of traditional life that date to this period. Specifically, missionaries Hans Egede, David Crantz, and Otto Fabricius all include detailed accounts of kayaking, sometimes with vivid depictions of hunting strategies, weapons and equipment, training techniques, dangers, and the position of the skill in daily life. By the late 1800s and early 1900s, there were also many early ethnographic works fostered through the creation of the Danish publication Meddelelser om Grønland; several of these provide highly detailed accounts of kayaking, emphasizing nuances of the skill and its position in social life and ritual.

In addition to written accounts, kayaks and associated hunting equipment were often collected by Europeans through a variety of means. Many of these have ended up in various museums and private collections, where in some cases they acquired their own histories and myths about how they came to Europe (e.g. Hoiris et al. 2002). Some examples date back to the earliest colonial interactions. For example, a kayak at the Schiffergesellschaft (Barge Master’s Guild Hall) in Lübeck, Germany is likely the oldest preserved kayak, and one of five collected near Sisimiut in 1606 (Feest 1991; Golden 2006:127; Gulløv 1997: 394). Another, kept at Trinity House in Hull, England, was collected by the crew on James Hall’s expedition in 1612, after he was killed by a kayaker near Sisimiut (Feest 1991:63; Hoiris et al. 2002:267), and there are also several collections in the Netherlands associated with the Dutch whaling period after 1650 (Petersen 1986; Golden 2006; Nooter 1971). There are many more Greenland kayaks which date from the 1700s-present, which are preserved in museums and private collections around the

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11 Most kayaks in museum collections were acquired through commission or trade, or were purchased from their owners for inclusion in ethnographic collections. However, many of the earliest kayaks from the 1600s were likely obtained through the abduction of their occupants; kidnapping was regularly practiced by both explorers and whalers until it was declared an offence by the Dutch States General in 1720 (Gad 1971:242; 1973:12; Scheffer 1987). This was an important aspect of early interaction, and the memory of these kidnappings lingered in the Inuit community – Hans Egede, the first missionary, received inquiries about victims some 70 years after they were abducted (Gulløv 1997:355). Gad (1971) estimates about thirty Inuit (mostly kayakers) were kidnapped from Greenland through a combination of Danish/Norwegian and Dutch explorers/whalers.
world. Harvey Golden's (2006) comprehensive study of over 100 Greenland kayaks includes detailed surveys and very interesting accounts of the performance characteristics of several kayaks that he has replicated. While no two kayaks are exactly alike (for reasons discussed in Chapter 5), it can be seen from these collections that the forms of kayaks have changed very little in Greenland since the 1500s, and even the earliest examples are distinctly Greenlandic.

The ethnography of Greenland is also unique in that it includes Indigenous perspectives of traditional life and kayaking from a very early time period. With the invention of Kalaallisut orthography by Samuel Kleinschmidt, and the creation of a Kalaallisut newspaper called 'Atuagagdluitit', there is by the late 1800s a number of Inuit accounts of kayaking written by kayak hunters, discussing the merits of hunting strategies and recounting stories of hunting adventures (Rink 1897)\textsuperscript{12}. Scenes involving historical events and hunting scenarios also figure prominently in early Greenlandic art – particularly that of Aron of Kangeq in the early 1800s, and Jakob Danielsen in the late 1800s. Kayaking continues to be an important aspect of oral history and literature in Greenland today – for example, H.C. Petersen's books on kayaking were inspired by his father's experiences and were the culmination of many decades of research with kayak hunters in the 1960s and 70s.

3.2.2 Outline of Greenlandic Kayaking Skills by about 1500 A.D.

By comparing ethnographic accounts to archaeological examples of kayaks (such as the Eqalulik and Morris Bay kayaks), it is possible to identify a number of distinctive qualities of Greenlandic kayaking. Within these distinctive traits, there is also much variation in terms of local and specialized variations, yet there is evidently a core tradition of Greenlandic kayaking. This distinctive tradition is likely an adaptation of Thule kayaking skills which were probably developed in the early Inussuk settlements of West Greenland between about 1250 and 1500. At the very least, Greenlandic kayaking was fully developed long before the first European accounts in the late 1500s. Over the course of the colonial period, kayaking skills changed very little, even with the introduction of new materials, tools, and rifles. Eventually, these skills were adopted in

\textsuperscript{12} An English translation of Inuit accounts of kayaking from Atuagagdluitit has been published in the journal 'QAJAQ' (Doucette 2005), and there is another compilation of translated articles by Rink (1877).
East Greenland by the late 1800s (Thalbitzer 1914), and northwest Greenland by the 1960s (Holtved 1967)\textsuperscript{13}.

In Greenland, the dependence on kayaking was nearly absolute; kayakers had to be able to go hunting daily, in all seasons, regardless of the weather. The structural characteristics of Greenland kayaks will be discussed in detail in chapter 5, but it is sufficient here to say that in comparison to the rest of the Arctic, Greenlandic kayaks are generally smaller, and are designed for performance over stability. Greenlandic hull shapes are highly manoeuvrable; they are more 'tippy', but allow a skilled kayaker to have a greater degree of control, especially in poor weather. Greenland kayaks are carefully tailored for a specific individual, ensuring that they fit tightly and contact the kayaker's body in key places, enabling them to control the movement of the kayak through subtle movements of the core and leg muscles. Greenlandic kayakers were famous for the ability to roll the kayak once it is capsized – a technique that is dependent partly on having a kayak that is well fitted. While this practice is also recorded in Alaska (e.g. Birket-Smith 1953; Heath 1968), it does not seem to have been practiced (or was rarely practiced) elsewhere in the eastern Arctic (Rink 1888).

The \textit{paaq} or cockpit conning for Greenlandic kayaks is usually round to ovoid and is designed so that it can be attached to two different types of seal-skin clothing that make the deck watertight. The \textit{akulisaq} is a short 'spray skirt' type covering that seals to the coaming from the kayaker's chest, and it was generally used in warmer weather. The \textit{tuilik} is a heavier jacket that seals the entire kayakers body to the kayak, except the face and hands – it is much warmer and used in the winter, or during stormy conditions, where it is very likely the kayak could be repeatedly capsized. Both the \textit{akulisaq} and \textit{tuilik} keep enough water from pouring in to the kayak when capsized, that the kayaker has time to roll before it is swamped. Greenlandic \textit{paatit} (paddles) are double bladed and generally short, which prevents them from catching the wind while paddling and allows for sudden bursts of speed. Greenlandic \textit{paatit} often have bone pieces (usually whale bone) pegged along the edges of the blade. These protect the paddle but are also said to channel water in a way that permits the kayaker to control the dripping, which helps them to sneak up very close to seals without making noise. Bone edgings are occasionally found at

\textsuperscript{13} From here, the term 'Greenland kayaking' refers to the long standing tradition developed first in West Greenland, and later spread to both East Greenland and northwest Greenland in the late colonial period.
Thule sites elsewhere in the Eastern Arctic but are a common feature in both East and West Greenland assemblages (Mathiassen 1930b 1933; Thomsen 1917).

3.2.2.1 General Hunting Techniques & Weapons

Greenlandic kayaks were used to hunt a very broad range of animals, through a variety of techniques which were locally specialized and dependent on the timing of seasonal availability. In general, seals, including small species such as ringed seal and harp seal, and larger ones such as bearded seals and hooded seals, were the primary prey hunted in all seasons throughout Greenland. For southwest Greenland, where the coastline is mostly ice-free throughout the year, seal hunting took place either in sheltered fjords or out in the open ocean in all seasons. Further up the coast past Sisimiut, where stable sea ice forms in the winter, kayaks could be used to hunt at the floe edge – in some cases using kayak types specially designed for the purpose (Petersen 1986; Porsild 1914:136-147). Other sea mammals that were hunted include narwhal and beluga whales, walrus, and polar bears (Hansen 1995; Nansen 1893). In early accounts up until the late 1700s, large baleen whale hunting seems to have been practiced seasonally in association with larger aggregations of communities. Early depictions indicate that whale hunts, like those of the Thule, were conducted through techniques that involved the coordination of both kayaks and umiaqs (Egede 1745). Waterfowl hunting was a seasonally important aspect of kayaking, and a variety were caught both opportunistically as an auxiliary activity on seal hunting forays, and on organized waterfowl hunting trips. Kayaks were occasionally used to hunt caribou at inland locations between Nuuk and Sisimiut. Similar to techniques in the Eastern Arctic, this involved the coordinated driving of caribou to key crossings where kayakers were ready to lance large numbers at once (Grønnov 1986). Finally, kayaks were also used to jig for a variety of fish including halibut and cod, as well as Greenland sharks for dog food. Fishing seems to have become more popular as lines and hooks became easily available through European trade (Birket-Smith 1924).

Hunting forays were often arduous with many hours of travel to hunting grounds and could involve days of sitting in the kayak for very long periods of time, sometimes in cold and uncomfortable conditions (Kreutzermann 2005; Nansen 1893; Olrik 2005). For each animal that
was hunted, there were usually a variety of techniques that could be used (Rink 1877:248). Some techniques involved team efforts, with multiple hunters coordinating their action to help each other and drive the prey in different directions. Other techniques were solitary, and practiced by lone hunters who could be away from communities for days at a time, carefully stalking prey and waiting for the right opportunity (Birket-Smith 1924; Fabricius 1962; Nansen 1893).

For most hunting trips, kayakers carried an array of weapon systems carefully arranged on the deck so that they could be readied and used very quickly if necessary. Figure 12 depicts the weapons that hunters generally brought with them on regular hunting trips. Included in the diagram are the paatit (paddle), sanarfik (kayak knife), and sermeersuut (ice scraper). Each of these are well documented in ethnohistoric accounts, and all of them are easily identified in the archaeological record – indeed, both the Eqalulik and Morris Bay kayaks included fragments from most of these weapons. Most continued to be used into the 1900s, and these traditional weapons supplemented the use of the rifle (with the exception of the alligaq or 'bladder dart'). All weapons had a great deal of variability, which was governed primarily by the hunter’s preference. While there are geographic patterns in the distributions of types, these were not strict and it was often the case that several variations were used by hunters living in the same community (Petersen 1986; Porsild 1914).

3.2.2.1.1 Norsaq

The norsaq is the throwing board that was used to launch most of the hunting weapons. It usually sat ready on the harpoon, so that it could be quickly drawn and readied, and was usually designed so that it also paired with the kayaker's other weapons. There were two different configurations for how the norsaq articulated with the throwing weapons. In some examples, the weapon shafts had two bone or ivory knobs on them called napasortat. The norsaq for this configuration would have two holes called putui, which were spaced so they interlocked tightly with the weapon shaft. As the hunter threw the weapon, it would detach, propelling the weapon forward from the top putui. The other configuration (which is represented in the Eqalulik kayak) has a hook on the top of the norsaq which was used to propel the harpoon from a bone piece at the end of the weapon shaft. The two types correlated with different types of harpoon systems.
Figure 12 West Greenlandic Kayak with Hunting Equipment Discussed in Text
3.2.2.1.2 Small Darts (Long Range)

There were two different smaller dart weapons that could be fired from the norsaq at a long range. The alligaq or 'bladder dart' is designed to hit sea mammals at a distance and is associated with open water kayak hunting throughout the eastern Arctic (e.g. Quimby 1940; Sabo & Jacobs 1980). The alligaq has a small skin bladder, inflatable through a small mouthpiece on the side. The alligaq dart is designed so that the foreshaft will detach when an animal is hit, lodging the blade in the animal, which then tows the bladder and the weapon shaft around. The idea of the bladder dart is to be able to wound animals from afar, so that the kayaker can then move in to kill and collect the prey. Another long range dart is the niuq, or 'bird dart' which is a multi-pronged weapon designed to catch the wings of waterfowl. In seasons when waterfowl were available, kayak hunters would usually have a niuq ready on the deck to supplement the seal hunt opportunistically.

3.2.2.1.3 Unaaq/ Ernannaq – Harpoon Systems (Medium Range)

The primary hunting weapon was the toggling harpoon system, designed to attach an avataq hunting float to the prey. Variations of the harpoon system are used by Inuit throughout the arctic, and the idea is that the avataq slows injured prey, and allows the hunter to track their movements from a safe distance (Figure 13). The tuukkat or harpoon head is designed to toggle when it pierces an animal's skin, anchoring the prey to the aleq, or harpoon line. There was historically a great deal of variability in the forms of tuukkat and most hunters had a preferred type (Petersen 1986:79-81). The aleq coils around the asloq or 'line holder', on the deck of the kayak, ensuring the line travels smoothly from the kayak and doesn't knot itself as the harpoon is thrown. The aleq is attached to the avataq, which sits behind the kayaker. As the kayaker throws the harpoon, they feed out the aleq and throw the avataq well clear of their kayak to ensure that the line does not become snagged. There was some variability in the harpoon shafts related to the configuration through which they were paired with the norsaq. The unaaq type of harpoon was propelled from napasortat on the side of the shaft. The ernannaq type or 'winged harpoon' was propelled with the hooked style of norsaq, and on either side of the harpoon shaft, it usually had
plated bone wings which were sometimes decorated. The use of one harpoon system over the other seemed to be a matter of preference and are described to have a very different feel when thrown (Petersen 1986:79). Both could be found in use alongside each other in the same community (Porsild 1914; Fabricius 1962). Harpoons were highly personalized to ensure that they fit the hunter's body size, technique, and strength – this resulted in a great deal of variability in the weight, balance and cross sectional diameter of the shaft.

3.2.2.1.4 Anguigaq – Lance (Short to Medium Range)

The anguigaq, or 'lance', was primarily for short range use, although there are some varieties that could also be launched from the norsaq. Once the prey was harpooned, the kayaker could get closer and use the anguigaq to kill the prey. Hunters could also use the lance to strike at close range targets or defend themselves if they are attacked. Like the harpoons, the anguigaq or lance, was also designed with a detachable foreshaft to protect it from breaking.
3.2.2.1.5 Rifles in Hunting

Firearms, introduced by Europeans, were used – or at least experimented with – by kayakers as early as the mid 1700s (Crantz 1820:142). However, front loading muskets were very difficult to prepare and fire from a kayak. Nansen (1893) and Rink (1877:155) for example describe kayakers in the mid 1800s, who were trying to use muskets, and it seems to have been a very difficult process to the point of being futile (see also Petersen 1986). It wasn’t until the introduction of cartridges that rifles were incorporated into kayak hunting techniques. There are a number of difficulties in firing a rifle from a kayak. While rifles theoretically increase the range of a hunter, it is difficult to fire accurately from a moving kayak. Depending on the season, seals sink once killed if they don’t have enough fat. To be in a position to shoot a seal, the hunter had to be close enough to fire, store the gun safely, and paddle towards the seal, using either the harpoon or lance to secure it from sinking. The coordination of these cumbersome activities meant that the kayakers still had to get very close to the seals. The actual advantage of rifles in kayak hunting was very small, and many of the traditional weapons outlined above continued to be used in coordination with the rifle, with the exception of the alligaq, which fell out of use. Reasons for why the rifle was eventually adopted are variously cited as it was a little safer, the kayaker didn’t have to be quite as proficient a harpoon thrower, and it increased the chance of killing the seal outright, which was both safer and more humane. To keep the rifle dry, kayakers used a seal skin holster called a ‘poortaq’, which was designed so that it could be attached to the decklines, usually placed under the asloq.

The hunting blind – a white cloth shield mounted on the front of the kayak – is one innovation that is generally linked to incorporation of the rifle in hunting and was introduced in the late 1880s (Petersen 1986). The hunting blind camouflaged the hunter as a piece of ice, and this allowed kayakers to get very close to seals when hunting with the rifle. To compensate for the hunting blind catching the wind, many of the later kayaks associated with this technique had an extra ‘skeg’ or rudder fin called an ‘aquut’ which was attached to the keel. The aquut helped the kayak to track straighter in a crosswind and will be illustrated in Chapter 5.
3.2.3 Kayaking Skill in Social Life

In the composite image assembled from oral history and varied ethnohistorical accounts, it is apparent that kayaking in Greenland was not just a technique or hunting tool, but was also an important part of daily life, where skill and the process of becoming skilled were central aspects of community life. Traditionally, the division of male and female roles in kayaking is thought to have been fairly rigid. Kayak hunting and the carpentry involved in construction were predominantly male activities, although there are recorded exceptions to this generalization (e.g. Thalbitzer 1914). However, the practice of kayak hunting was also dependent on the experience, knowledge, and skill of women who prepared and sewed the skin covering. Hunting success was ritually dependent on the expertise of women, and women also played important roles in the training and enskilment of kayakers from infancy. This complex interdependency highlights the importance of understanding kayaking as more than an exclusively male experience. Rather, kayaking is a collective enterprise that traditionally involved a high degree of ecological knowledge, technical ability, and sensorimotor skills on the part of both genders.

3.2.3.1 Dangers of Kayak Hunting

Kayak hunting was an extremely dangerous activity, and it took many years of training to develop the skill to become a hunter. Hunting forays could involve days of travel to and from the hunting grounds, exposing kayakers to many risks such as severe weather, becoming lost in the fog, or being crushed by icebergs in locations such as Disko Bay. There are accounts of kayakers being blown out to sea during a storm and having to fight sometimes for days to get back to land (e.g. Watkins 1934). The animals that kayakers hunted also posed some danger as well, and injured seals were known to bite through the skin of the kayak (Crantz 1820:244; Fabricius 1962; Petersen 1986). Walrus were generally recognized as the most dangerous animals, and there are many accounts of walrus attacking kayakers. There are even accounts of surprise attacks, where a walrus suddenly drove its tusks up through the bottom of the kayak (Hansen 1995; Nansen 1893). Hunting techniques could also be a source of danger, especially in the operation of weapons and related equipment. The most dangerous situations involved the scenario where, in harpooning an animal and deploying the avataq, the harpoon line caught or tangled around the kayak, dragging the hunter through the water (Nansen 1893).
Even in perfectly calm weather, kayakers were prone to a danger called *kajakangst*, which was a sort of sensory hypnosis, usually triggered by paddling on flat water for too long. Many kayakers described it as a dizziness and confusion as to where the horizon was, combined with a sensation of floating through the air. The danger is that the kayaker loses their sense of balance and cannot determine if the kayak is above or below water, often becoming so disoriented that they are unable to right themselves. Kayaker's accounts of *kajakangst* report feeling as though the kayak is sinking, and once rescued or making it to shore, being surprised to find they are completely dry. Other accounts report a sensation that there was a large animal moving around under their kayak (Gussow 1963:20). Some hunters seem to have been more prone to *kajakangst* and developed a complete phobia of kayaks (Christiansen & Rud 2013; Egede 2005:41; Foulks 1972; Heath 1991: 100-101).

The dangers of kayaking are not just something that was romanticized in European accounts. The ethnohistoric record is replete with examples of accidental kayak deaths, or assumed deaths where hunters simply disappeared. On average, males lived substantially shorter lives than women, and some early accounts of Greenlandic demographics suggest that there were very few men over the age of 50. Ole Marquardt's (2002-48) comprehensive study of historical demographic and census records suggests that kayaking had a very strong impact on the demographics of Greenland. The high mortality rate of kayaking was linked to a substantial imbalance of males and females in the demographics of Inuit communities – a pattern also noted in other studies (Robert-Lamblin 2006). Even for the most skilled hunters, with years of experience and knowledge, there was always the possibility of encountering a situation that they were not prepared for, and it is apparent from the demographics of Greenland in the colonial period that most males could expect they would eventually die in their kayak.

### 3.2.3.2 Kayaking, Enskilment and Social/Individual Identity

Readiness, and the ability to intuitively predict, sense, and react skillfully in a wide range of potential scenarios while kayaking was critical for hunters. Enskilment – the development of capacities for awareness and response – was a central aspect of becoming a part of the social fabric of the broader community. Individuals aspired to become a *Qaajavik* (an experienced
kayaker) or a *Piniartorsuaq* (a Great Hunter), who were revered for their skill and ability to understand and act in the world around them. Skill was an important part of community leadership, and it was an important basis of connection within the community. A high degree of skill meant that an individual was able to provide and be depended on (Thalbitzer 1917:468). Successful hunting was not just the result of a hunter's skill, but also the broader interdependence of the community in the training of individuals, including the building of kayaks and sewing their skin covers.

Enskilment in kayaking was an important characteristic of childhood, and there were many games played to help develop fitness and dexterity necessary for kayaking (see also Hardenberg 2010). Petersen (2004) notes that this began even in infancy; for example, mothers would play a game with toddlers where they would sing them a song, and at the mention of a particular word, the toddler would have to throw a pretend harpoon (Petersen 2004). As children matured, there were more complex games. *Qajaasaaq* – the stone outlines of a kayak found throughout the Arctic – could be used to play kayak hunter, as well as harpoon throwing games structured by rules that simulated scenarios where the hunter has to hit a target (Nooter 1991:338). There were also many other games played to increase dexterity, such as one found throughout the Arctic, that entailed competitors with small sticks attempting to spear a small hole in a spinning piece of bone which hangs from a string. Other games, included the *allimaartaqattaarneq*, first noted by Hans Egede (1745:162), which consist of rope exercises that help kayakers develop the fitness associated with complex skills such as rolling (the relationship between these and rolling is discussed in greater detail in Chapter 6)(Petersen 2004).

There are instances in the ethnohistoric record where accounts may be taken to suggest there was a formalized process of apprenticeship with structured stages associated with particular ages, but there is enough variability to suggest that if this existed it was locally and personally specific (Crantz 1820:150; Thalbitzer 1914). An important stage was when a kayaker got their first kayak and became a *'qajaaraq'* or a beginner at kayaking. The exact timing of this seems to have been contextual to family contingencies such as availability of materials, or if it was felt that an individual was ready. Once a person had a kayak, they could begin practicing some of the basic skills of kayaking, such as balance and throwing weapons. As their skill increased, a beginner could begin learning how to roll their kayak. Kayakers had to be able to roll in a variety of circumstances if they were capsized; for example, if the paddle was caught awkwardly in the
harpoon line, or if they became separated from the paddle. Crantz (1820:140-141) provides the earliest accounts of how kayak rolling was learned, and he documents individuals practicing a variety of different types of rolls, most of which continue to be practiced nearly 300 years later by the modern kayaking community today. It could take kayakers several years of careful training and practice before they had enough ability to go out with hunters on hunting trips (Crantz 1820:150). Training was broken into different techniques for different animals, and kayakers had to learn how to operate as a team and coordinate their actions in relation to other hunters (Thalbitzer 1917:608). Enskilment in kayaking marked life stages of increasing importance and connection within the community, and there were many rituals associated with a kayaker catching their first seal and sharing it within the community. For example, in one such ritual, after distributing specific cuts of the meat to different relatives, the seal's intestines were placed on the ground, and the new kayak hunter had to eat them without using his hands.

Enskilment in kayaking was a process that had no specific endpoint, and even most skilled kayakers could compete with each other, practice, and improve their ability (Nansen 1893). Many accounts of traditional social life discuss the recounting of hunting stories as a prominent activity that families did together in their houses in the evening with visitors (Crantz 1820; Egede 1745). Hunting stories focussed on experiences and dangerous scenarios and could include vivid depictions involving mimicking the motions and the use of model kayaks and animals to illustrate the narrative. Stories included incidents hunters had witnessed or learned from other hunters. Hunting techniques and discussions of 'right action' in certain situations were important points of dialogue in the community, and it is evident in Porsild's (1914) account that there were multiple schools of thought for different techniques. Many of the earliest Kalaallisut publications of Atuaagadliuitut were articles written by hunters, containing accounts of hunting scenarios, rescue techniques, tips for learning, accounts of accidents and dangerous scenarios, as well as discussions of the merits of different hunting technologies (Doucette 2005; Petersen 1986). Kayak hunting scenarios figure prominently in the early art of Greenlanders in the 1800s and early 1900s – for example that of Aron of Kangeq, Jakob Danielsen, Jens Kreutzman, and Karale Andreasson (Rasmussen 1938; Thisted 1999).

Kayakers sought to improve their skill and demonstrate their prowess – sometimes through seemingly paradoxical risk. Hunting dangerous animals was a mark of achievement, especially hunting walrus, which can be very aggressive (Hansen 1995). In East Greenland, for
example, Holm notes that some kayakers would hunt polar bears to demonstrate their skill and it was considered an honour for a kayaker to have scars on their body from the claws of a bear as a sign of their tenacity (Thalbitzer 1914). Another mark of skill, noted by Fabricius and Nansen, was to hunt without the *avataq*, instead fixing the harpoon line to the kayak, or around their waist, effectively using themselves as a harpoon float. This technique was extremely dangerous because unless the prey was killed outright, the kayaker would be dragged by the frantic and injured animal – second for second, they would have to brace the kayak and adjust their performance, keeping the kayak from capsizing or being dragged uncontrollably. Fabricius notes that many kayakers died attempting this (Fabricius 1962:7). Demonstrations of skill through competitions were features of periodic social aggregations, and there is a longstanding oral history linking Sisimiut in particular to competitions. There were many instances of large aggregations recorded by explorers and missionaries during the summer, some with as many as 100 kayaks in the water at once (Gulløv 1997). Such demonstrations and competitions also likely formed the context in which kayaking skills were observed in early European accounts. For example, Crantz's description of the rolling manoeuvres probably derives from observations of either competitions or training sessions – he is unlikely to have been present during actual scenarios where kayakers were unexpectedly capsized.

3.2.3.3 Kayaking and Ritual

As noted in the discussion of demographics, most men could assume that they would probably die in their kayak while hunting, and kayaks figure very prominently in the intersection of social and ritual life. As evident in the archaeological record, it was common to bury individuals with their kayaks along with their tools (Birket Smith 1924:266; Felbo et al. 1993; Grummesgaard-Nielsen 1997; Petersen 1986:56). In East Greenland, kayak burials were also practiced, but Rasmussen (1938) notes that many hunters had preference to die at sea; in their concepts of an afterlife, an underworld below the sea was a preferable place for a person's soul to go after they died (Sonne 2000). Rasmussen (1938) recounts stories of kayakers who died on land being put into their kayaks by their families and pushed out to sea, and even a few cases where sick individuals who felt they had no hope of recovery threw themselves into the ocean.
Figure 14 Two sketches of *tupilak* attacks, drawn by Kårale Andreasen. Redrawn from Knud Rasmussen (1938).

In addition to the normal dangers of hunting, there was also a pantheon of beings and monsters that it was perceived possible to encounter when kayaking. One of the most dangerous of these was a *tupilak* which could take a shape of an animal and attack unsuspecting hunters. *Tupilaks* were a sort of unholy abomination of human and animal bone, whose animation was summoned into existence to be used to wage vengeance. One could consult an *Angakoq* (shaman) if they wished to use a *tupilak* against someone. If a hunter was to suddenly find themselves being attacked by an animal, it was assumed to be a *tupilak* that someone had sent for them (Figure 14)(Rasmussen 1938:159-164). While the position of beings such as the *tupilait* in Inuit mythology is very complex, it is important to note that they often figure in stories of hunting encounters and contribute to the sense of preparation and readiness that kayakers depend on. Many of the artistic depictions of *tupilak* encounters display the hunter with the harpoon line tangled around the kayak. Narratives of *tupilak* encounters emphasized that there were scenarios that even the best kayakers could not anticipate, and that there was no endpoint to enskilment.

Protective amulets were an important aspect of kayak hunting and are described by John Davis in 1586 (Gad 1979; Gulløv 1997). Amulets could take a variety of forms and were dependent on the concept of *Inua* which is often described as the idea that there are animating spirits that give things their properties (Thalbitzer 1914). Amulets work by directing the *Inua* of something that could be helpful to a kayaker. For example, if an individual was concerned about capsizing in bad weather, they might try to use an amulet to direct the *Inua* of something that
Figure 15 Examples of Kayak Amulets. 1) Pieces from the front cross strap of an East Greenlandic kayak, consisting of ivory carved in the shape of a polar bear (which faces the kayaker) and two faces which oppose each other. Photo courtesy of the Sisimiut Museum. 2) An ivory duck from the front cross strap of a West Greenland kayak. Photo courtesy of the Danish National Museum (L.1878). 3) Polar bear teeth amulets found in association with the Morris Bay Kayak. Photo courtesy of the Greenland National Museum (KNK 122 x 78-79). 4) Harpoon holder made of narwhal ivory carved in the shape of a person, found in association with the Morris Bay Kayak. Photo courtesy of the Greenland National Museum (KNK 122 x 99).

They perceived as being very stable, such as a duck. A duck amulet could work either by incorporating a carved image of a duck into the kayak (usually as a part of the deck straps) or by actually including a piece of a duck and sewing it into the skin (Rasmussen 1938; Thalbitzer 1914). Some amulets could be very subtle and worked by mimicking a few lines or patterns (Rosing 1996). Another type of amulet consisted of pieces of kayaks or equipment from Great Hunters, which builders would incorporate into their kayaks, directing the Inua of experience and skill. Indeed, Jens Rosing (1998) describes the literal definition of Inua as 'you will see yourself in the thing that you make'. Amulets in general were highly personal and contextual both to aspects of an individual's skill and their personal observations of properties in the
environment. Kayaks preserved in the ethnographic collections of museums sometimes have amulets sewn into the seams of the skin covering, and are only visible from the inside of the kayak. These 'hidden' amulets were likely placed during the sewing of the skins, highlighting the ritual interdependency of gendered knowledge.

3.2.4 Kayaking and European Interaction

Throughout the colonial period, kayaking was an important point of separation in identity between Europeans and Inuit (Kleivan 2002). The earliest missionaries depended on kayakers to trade for food, and most of the colonial period trade was based on products that were caught by kayak hunters. Kayakers were even instrumental to the administrative operation of Greenland as a colony; kayakers were used to pilot large ships through difficult waters and even to deliver mail between communities through the *Kajak-post* (Kleivan 1990; Rink 1877). Kayaking highlighted the inherent juxtaposition of colonial assumptions on the part of Europeans who proselytized the Inuit, introduced new technologies, organized governance, and advocated the 'modernization' of Greenlanders, yet through much of the colonial period were dependent on the local and tacit knowledge of Inuit. Crantz (1820:140) describes kayakers as having a 'dexterity peculiar to themselves', and the ability for Greenlanders to go out in any conditions is often cited in the literature. There are many instances of Europeans attempting to learn the skills of kayaking, sometimes ending in tragic results. Kayaking continued to be practiced as the primary mode of subsistence for most families, well into the 20th century. The reasons for decline of kayaks, the eventual replacement of kayaks with outboard motorboats by the 1960s, and the resurgence of kayaking and interconnection with Greenlandic independence are discussed in the next chapter.
Chapter 4
Traditional Kayaking and Inuit Cultural Heritage in Modern Greenland

As Inuit, or Greenlanders, we wouldn't have survived if the kayak wasn't invented. With the kayak, we were able to catch nature's most useful animal, which gave us the most important things for living. No matter if the weather was warm or cold, we can't ignore the fact that what binds us as one big society, is that the kayak is the reason we were able to survive. It would be too incredible for us to turn our backs on preserving that heritage.

Aalibak Augustussen (2010) EMML

"Inuuttuut!!!" I can hear someone in the crowd exclaim when I review my footage from the 2011 kayak competition in Sisimiut. It means 'like an Inuk' or 'just like the old ways' and they are cheering for Kuumumnguaq Davidsen as he performs some of the most difficult rolling manoeuvres. He has just completed a particularly challenging one called issorikkut aalatsineq, where the kayaker has to right themselves with the paddle held behind their back (Figure 16). The manoeuvre is an old skill and it simulates a very dangerous hunting scenario where the kayak has been unexpectedly capsized and the paddle has become tangled in the harpoon line; the awkwardness of the position allows for a very limited sculling motion complicated by the kayaker having to keep their weight forward as they roll. After dramatically fighting to complete the roll, Kuumumnguaq collapses on the deck of his kayak from cold and exhaustion. It is the best performance of the competition so far. He is already doing better than his brother Jaffet's attempt at the rolling manoeuvres an hour earlier, and everyone is beginning to sense that he is going to win the 'kayak man of the year' award. As he struggles to catch his breath, the crowd cheers loudly, and the KNR\(^{14}\) media boat moves in to get a clip for the news, blocking my shot.

As an ethnoarchaeological project, the core premise of this thesis is that the kayaking community in Greenland offers an opportunity to better interpret the archaeological record of

\(^{14}\) Kalaallit Nunaata Radioa (The Greenlandic Broadcasting Company)
Figure 16 Kunuunnguaq Davidsen performs the *isserfikkut aalatsineq* roll. The numbers indicate the succession of images. This is very likely one of the first rolling manoeuvres observed and recorded by David Crantz (1820:140-141) in the mid 1700s.

Inuit culture. However, as depicted in this typical scene from my fieldwork, the context of kayaking in Greenland today is very different than that of its traditional form, once central to livelihood. The manoeuvres Kunuunnguaq was performing simulate actual hunting scenarios, and the design of the kayak and equipment he is using reflect the same general pattern that was brought to the Eastern Arctic by the first Thule migrants. However, the scene is firmly rooted in the present; instructions from the head judge bocm through a loud speaker above the noise of the
crowd, and the harbour where the rolling event is taking place is decorated with many Greenlandic flags and advertisements for local businesses.

This chapter establishes the range of ethnoarchaeological inquiry that could be addressed through my fieldwork. It examines the development of the modern kayaking community in order to understand the relationship between the skills of kayaking and Inuit communities in the more distant past. While kayaking has never completely disappeared in Greenland, the modern practice is strongly connected to the politicization of heritage in a country that is rapidly changing, and where nationalism and Indigenous identity are closely related. The persistence of traditional kayaking in Greenland today is largely the result of an organized effort, and there is a history of deliberate measures to foster the development of these hunting skills even though they are no longer the basis of subsistence. For the community, the process of becoming a skilled kayaker is meaningful in the present – it is an important link to a long heritage of environmental knowledge and intergenerational experience. By tracing the development of this community and the process of negotiation through which the skill has been adapted, this chapter identifies enskilment in kayaking as *praxical heritage*\(^{15}\) – a cultural process through which intergenerational experience is embodied and applied in new contexts. The chapter concludes by assessing the processes that can be observed in the present and scrutinizing their potential for archaeological interpretations through relational analogy.

4.1 *Qaannat Kattuffiat* – The Kayak Federation

The competition depicted in the opening of this chapter was created by an organization called *Qaannat Kattuffiat*, which means the 'The Kayak Federation'. In Greenland today, kayaking is practiced primarily (though not exclusively) through *Qaannat Kattuffiat*. *Qaannat Kattuffiat* was developed in the mid 1980s, at a time when subsistence kayaking had almost completely disappeared. For over 30 years, *Qaannat Kattuffiat* has been working to develop a place for traditional kayaking in modern Greenland. It oversees a network of local kayak clubs in

\(^{15}\) The term *praxical heritage* is adapted from Don Idhe's (2009:116) definition.
most of the major communities in west Greenland and receives funding from the Government as both a heritage and sports organization.

The history and development of *Qaannat Kattuffiat* represents a shift in kayaking from a subsistence skill to something that is practiced primarily as an exploration of heritage. For the community, it is important to ensure that the *physical process* of building kayaks and becoming skilled in their use persists, because they consider it to be a constitutive part of Inuit culture. Kayaking is a very complex skill requiring a high degree of ability and was developed through the experiences of many generations of hunters. Becoming a kayaker is a transformative experience that attunes the senses and communicates types of knowledge that are kinaesthetic and can only exist through practice. *Qaannat Kattuffiat* advocates that kayaking is a link to a cultural heritage of intimacy with the environment which continues to be meaningful in the present.

Modern kayaking must be understood within the broader position of heritage in Greenland. As noted in Chapter 1, Greenland’s recent history has been characterized by a movement towards independence, resulting in the 2009 transition to ‘Selvstyre’ (Self Rule Government) as an independent country within the Kingdom of Denmark (Figure 17). As a newly formed Arctic nation, Greenland faces many economic and cultural challenges. With an environment that is rapidly changing, a young population that is growing larger, and mounting pressure to develop natural resources, there are many questions about Greenland’s future. Inuit heritage has been a topic at the forefront of Greenlandic politics – both as a means of establishing the right for self-governance, but also in terms of defining an Inuit concept of modernity that adapts the experiences and knowledge developed through generations of hunting life to the present (Nuttall 2010).

4.2 Kayaking almost disappears: 1920s-1970s & the 'Danification' of Greenland

Before the formation of *Qaannat Kattuffiat*, the decades between the 1920s and 1970s witnessed a very sharp decline in the number of families that depended on kayak hunting as a
primary means of subsistence. During this period, often referred to as 'Danification', Greenland was changing very rapidly as a result of Danish modernization policies and control of governance and trade (Dahl 2000; Friedberg 2010; Graugaard 2009; Pedersen 2009). There were large demographic shifts, as families moved to the larger towns which had housing, services, and many new types of jobs and opportunities to support families through the Danish-controlled fishing industry (Kleiven 1969). Kayaking is one of many traditional skills that began to disappear as a part of this process at variable rates across Greenland (e.g. Hansen 2009: 99-130; Petersen 1987). By the 1960s, very few young Greenlanders were learning kayak construction, skin preparation and sewing, and hunting/stalking techniques, and as a skill, kayaking was slowly becoming confined to an aging population of Elders.

John Pedersen – a kayak hunter and businessman from Ilulissat – describes the decline of kayaking as a process that was related to a combination of factors, both technological and social. John was born in 1964, and he grew up in a family that placed a lot of emphasis on traditional skills. He learned kayaking from his Uncle, who was a very skilled hunter. John was an exceptional case because most families during the period had ceased to emphasize teaching these skills as a part of childhood. In discussing the decline of kayaking, John describes how the introduction of new technologies altered the way that people moved in relation to the landscape.

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16 Danification is also referred to sometimes as 'Danization'.
Outboard motor boats were especially effective at changing the nature of hunting and fishing; they were affordable for those subsisting through jobs, and outboards made hunting accessible as a family activity that could be performed in the evenings and on weekends:

25 years ago when Qaannat Kattuffiat started, you didn't see many kayakers because the boats with outboards just beat the kayak, and in a very effective way. Because a kayak—you can't go fast with a kayak. You can only shoot 1, 2, at the most, 3 seals and there's a lot of seals around you. If you go with a boat—an outboard—you can be by the seals within 15 minutes, instead of 2 hours. And you can shoot 10 in 1 hour and not bothering towing them to town. First you just have to put them in the boat. And...you don't have to keep the balance all the time. Enjoy a cup of coffee once and a while. Can't do that in a kayak. It's more safe, fast, more efficient. So the kayak almost disappeared 25 years ago and it was the Greenland Home Rule Government that started [Qaannat Kattuffiat] just to preserve the old heritage of kayaks.

John Pedersen (2010)

Changes in the process of childhood during Danification are also considered important factors in the decline of kayaking. As an extremely complex and dangerous skill, mastery of kayak hunting takes many years of careful training and practice with the guidance of experienced hunters. In traditional life, children had to develop their fitness, committing movements and subsets of skill to motor memory for years before they were even able enter the water to apprentice with older kayakers (as outlined in Chapter 3). Schooling and proficiency in Danish were becoming government policies—the culmination of which was the 1967 Education Act (Pedersen 2009: 15). With schooling as a dominant part of childhood, it became more difficult for children to learn the skills with the same opportunities for apprenticeship; children were less able to go on hunting trips and to spend large amounts of time learning traditional skills.

Many in the kayaking community who grew up at this time have similar memories of being around family members who were skilled hunters, and in some cases they might have received a small amount of instruction from them, but they were not actively training to become kayakers. For example, Kampe Absalonsen is another prominent member of the Ilulissat kayaking community, and formerly the head judge for Qaannat Kattuffiat's annual competition,
who never had the opportunity in his youth to become formally instructed in the art of kayaking. He is originally from Sisimiut and recounts that although he was very interested in kayaking as a teenager, and his uncle was also a good hunter, his family was unable to find the time to teach him the skill. He notes that among the old kayak hunters, there was a code of humbleness – the 'Great Hunters' would never discuss their abilities and skills. As a result, the process of apprenticeship with them could be something that was slow and could only happen through careful learning and persistence on the part of the learner.

Although John Pedersen is one of the few from his generation taught the skill directly as a part of childhood, even his own story of becoming a kayak hunter was interrupted by formal schooling. John's father was Danish and his mother was Greenlandic; his mother's side of the family felt it was important for him to embrace his cultural heritage, and he had started to learn how to kayak when he was about 12 years old through the guidance of his Uncle. However, during the crucial years of training as a teenager, he was sent to boarding school in Denmark and only resumed learning when he returned to Greenland at age 18. Although John was learning the skill directly from a member of the previous generation, it can be seen that it was not a question of subsistence or necessity, but rather out of a sense that it was an important part of heritage.

4.3 Home Rule, 'Greenlandization', and the Politicization of Heritage

At the same time that kayaking was declining, a political movement was developing among Greenlanders that was pushing for independence from Denmark. A growing number of Greenlanders – often educated in Denmark, fluent in Danish, and familiar with Danish leftist politics of the 1960s & 1970s – were not content with the inequality and colonial assumptions inherent to Danish modernization policies of the Danification period (Brøsted & Gulløv 1977; Graugaard 2009). Mobilized by a number of political parties that were labelled 'radical' at the time, the independence movement negotiated the establishment of Hjemmestyre (Home Rule

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17 Siumut & Inuit Ataqtiguit both emphasized Inuit cultural values, and became dominant political parties once Home Rule was established. Different perspectives on Inuit heritage, what it constitutes, and how it should be applied in policy making, remain important points of distinction between the two parties.
Government). The establishment of Home Rule in 1979 entailed the transfer of many, but far from all, responsibilities for governance from Denmark to Greenland. This was an important step towards independence – Greenlanders could now vote for representation in their own Parliament in Nuuk, and they could make domestic policy decisions that emphasized Inuit values rather than Danish ones.

Heritage was an important aspect of the reaction against Danification; the independence movement highlighted the distinctiveness of Greenlanders as a people who already constituted a nation who had the right to govern themselves. Indeed, 'nation building' was a stated objective of Siumut, and Greenlandic national identity emerged during this period in part due to a constructed notion of tradition (Dahl 2000; Fernandez 2011; Graugaard 2009; Nuttall 1992). The independence movement conceptualized traditional life as something inherently opposed to Danish modernization policies. Geographically, traditional life was something that existed out in the smaller settlements, whereas modernity was in the larger Danish built settlements like Nuuk. After Home Rule was established in 1979, there was a great deal of policy making that was intended to reverse Danish modernization. For example, Kalaallisut (Greenlandic) was now emphasized in schooling and many other decisions were made with the intent of emphasizing Inuit culture. These early days of the Home Rule government are often referred to as 'Greenlandization'.

It has been argued, both in Greenlandic political discourse and academia, that the image of tradition that guided the Greenlandization policies of the early Home Rule government was one that viewed traditional culture as static, unchanging, and passively inherited between generations (Nuttall 2010). For example, in his ethnography of Saqqaq, a small settlement in Disko Bay, during the early 1980s, Dahl (2000) persuasively demonstrates that the early nation building strategies of the Home Rule Government were based on a homogenizing perception of Inuit cultural values. As a result, many of the policies this view informed actually subverted and undermined local knowledge and personal experience, favouring an idea of Inuit culture that had in many ways been constructed as a reaction to Danification.\(^{18}\)

Inuit technologies, and kayaks in particular, were important symbols of tradition and heritage during Greenlandization and were very closely tied to the emerging national identity.

\(^{18}\) Indeed, to this day, the first point of policy for Siumut, a dominant political party in contemporary Greenland, states: "1. To build a homogenous, active, and vital society who are conscious of the population as their responsibility."
The political discourse of the period is replete with the use of kayaks as an icon of traditional subsistence and hunting life – indeed the gradual disappearance of kayaking was presented as a prime instance of traditions that were under attack by modernization. For example, Tupaarnaq Rosing Olsen's (2005) book that documents the independence of Greenland between 1939-1979, translated into Danish by former Premier Kuupik Kleist, is actually entitled "I Skyggen af Kajakkerne" or "In the Shadow of the Kayaks". Another example was the journalist Ulloriannguaq Kristiansen's response to a Danish economist's paper that called for Greenlanders to abandon Kalaallisut (Greenlandic) and embrace Danish language and culture to achieve progress. Kristiansen famously said "Greenland without Kalaallisut is like a kayak without its skin cover" (Pedersen 2009:15). The renewed interest in kayaking initiated several oral history and museum projects resulting in a number of books and articles written in Greenlandic including H.C. Petersen's "Qaanniormermut Illitsersuut" (Instructions in Kayak Building) (1981) and "Qajaq: Inoqarfinni Tamani" (Qajaq: The Old Way of Living) (1987).

Qaannat Kattuffiat traces its origins to the Greenlandization period of the late 1970s & early 1980s. As an important symbol of traditional life, interest in kayaking intensified considerably during this period. However, the generation of Greenlanders now becoming interested in learning the skill had been raised without it, and while there were still Elders who had been kayak hunters, most were getting quite old and very few were still able to hunt. By the early 1980s, practicing kayaking was an issue of recovering the skill, and it was clear that if kayaking was to be maintained, it would have to be done as an organized community effort. Qaannat Kattuffiat officially founded in 1984, through the support of the newly formed Home Rule Government (Lauritzen 1989:98).

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19The incident took place at the 'Greenland Today and Tomorrow' conference, and Kristiansen's response is translated by Ivala Pedersen (2009:15). Kristiansen was responding to Mogen Boserup, a Danish economist who was proposing that the modernization policies of Danification (which had already involved the forced removal of Greenlandic children and their adoption by Danes) be intensified, and that there was no place for traditions such as Kahallisut in Greenland. The content of Boserup's paper, including direct quotations, is also found in Håglund (1976:78). It is reported that when Boserup attended another conference on Greenlandic modernization the following year is Sisimiut, he was presented with a model frame of a kayak to emphasize the point (Fægteborg 2005:1003).
4.4 *Qaannat Kattuffiat* Origins, Development, and Focus on Physicality

Back when *Qaannat Kattuffiat* first was established their main purpose was to preserve the physical aspect of kayaking. They didn’t like that the kayak was in museums and no one knew how to use it.

Niels Thomassen – President of *Qaannat Kattuffiat* (2011) *MJP/ML*

Niels Thomassen's comments highlight *Qaannat Kattuffiat*’s focus on the physicality of kayaking and were echoed many times in the voices of different participants throughout this project. While the formation of *Qaannat Kattuffiat* was intrinsically linked to Greenlandization, its focus on practice ran counter to the static and inherited view of Inuit culture that had been constructed in the reaction to Danification. *Qaannat Kattuffiat* has become an important part of developing a nuanced view of the relationship between kayaking heritage and modern Greenland, and this is largely due to the focus on the physical process of learning. In discussing the origins of *Qaannat Kattuffiat*, a common point of view expressed in interviews is that during the early days of *Qaannat Kattuffiat*, when people started to re-learn the skill, it was quickly realized that kayaks contain a type of heritage that can exist only through practice – specifically noting that museums or stories are not enough to communicate the cultural knowledge that is a part of kayaking.

The initial challenge for *Qaannat Kattuffiat* was that most of the people interested in building the community did not themselves have the skill and ability to hunt. The founding members comprised primarily the generation who had similar experiences to Kampe; in many cases they had grown up around kayaking, but for a variety of reasons had not become kayak hunters. This near-disappearance of kayaking contributes to a sense of rupture in the kayaking community and is an important aspect of establishing the context of *Qaannat Kattuffiat*; during my fieldwork, it was a subject that was often referenced in depicting the importance of the physicality of kayaking.

Aalibak Augustussen remembers some of the difficulties the community had in reviving the skill. Born in 1950, he was originally from Kangaamiut but moved to Maniitsoq in the 1970s
(but now lives in Sisimiut). In his childhood, Aalibak's family depended on kayaking, but like many others of his generation, he had never been trained to be a hunter. When kayaking was gaining popularity in the late 1970s/early 1980s, he wanted his grandson, Siivaq, to learn kayaking so he contributed to the founding of Pegatigiffik Qajaq Maniitsoq (The Maniitsoq Kayak Club), eventually becoming its president. At that time, there were very few people in the club who knew how to build a kayak properly – some had a general idea or were able to use a blueprint from Petersen’s books. However, Aalibak describes that these early attempts were just 'models' (a point that will be returned to in more detail in Chapter 5) and that nobody knew the meaning of the technical decisions they were trying to replicate, so they sought the help of Elders who had a lot of experience with hunting.

At the time, Maniitsoq was considered a big town, and there weren't too many Elders who lived there that knew how to build kayaks. So the club members would travel to the smaller settlements to learn from several 'Great Hunters'. In particular, they made many trips to Kangaamiut to learn in person from Lars Goliatsen, one of the last Great Hunters. At the time, most of the Great Hunters had stopped kayaking years earlier and were too old to demonstrate the skills. Manasse Mathaeussen was one exception – he was a great hunter originally from the Nuuk area, but had grown up in Ammassalik on the east coast, and he was able to perform many of the more difficult manoeuvres like the rolls into his 70s (see also Heath 1990:11; Lauritzen 1989:98). Two other Elders, Anders Rosing and Mathias Karlsen were able to teach traditional hunting techniques and how the equipment was to be used.

Aalibak notes that these Elder knowledge projects were critical to Qaammat Kattuffiat's attention to practice. Working with the Elders and trying to learn their skills was difficult work, and focussing on the techniques exposed a stark contrast between learners and skilled kayakers that went far beyond technical ability. This gap constituted the sense of rupture in heritage, and there was a realization in the early community that kayaks were more than just a tool. The physicality of kayaking quickly became the focus of Qaammat Kattuffiat, not just for the sake of preserving the skill but also for the transformative role of learning as a cultural process. In discussing the origins of Qaammat Kattuffiat, there are five consistent points that were emphasized in interviews about why the community feels it is important to ensure that the practice of kayaking and specifically the process of learning persist. The following discusses these five points in greater detail:
1) Embodied Knowledge

The Elder’s sense of the world around them was intuitive and highly dependent on perceptive abilities. As hunters, they could safely navigate through icebergs and fog, and they could recognize cues in the environment to sense how the weather would change. They were able to predict the movements of sea mammals. When they were stalking, they understood how the movements of their kayak would be perceived by their prey, and could recognize the right moment to strike. The knowledge behind these types of abilities is sensory and dependent on motor memory. It was apparent that these types of knowledge are tacit (as per Polanyi 1958); they are kinaesthetic in nature and contained within a person’s ability to perceive and react to the environment.

2) Developmental Knowledge

In trying to recover the skills, it was also evident that the knowledge contained in the skills and abilities of kayaking cannot be passed between generations in a simple process of verbal or instructional transmission. The skill can only be developed through years of careful training, attuning of the senses, and personal experience. For the Elders, becoming a hunter was a lifelong process, which had started in their childhoods before they could even remember. As children, they learned first through games that simulated hunting scenarios, and worked to develop their technical ability and fitness. As they grew older, they moved on to apprenticeship with older hunters and through time accumulated their own personal experience, becoming skilled hunters and in some cases Great Hunters. In this sense, the transfer of kayaking skills between generations is better described as a process which I have described in Chapter 2 as ‘co-construction’. It was difficult for the early members of Qaaniit Kattuffiit to learn the art – many who were starting as adults found that complete mastery of all of the skills and abilities necessary to hunt was already out of reach.

3) Kayaking as a Framework for Building Experience
During interviews, community members often framed the importance of the physicality of kayaking by citing examples of experiences they have had that could only have occurred through kayaking. While complete mastery of kayaking was not possible for many kayakers who were starting as adults, any attempt at learning was a way of joining a community of shared experience. Every aspect of the designs that are used to build kayaks, the strategies for physical conditioning, and the methods used for hunting are related to scenarios where the technology must function. These techniques were perfected through many generations and are a compilation of their experiences. As the skill needs to be re-created through each individual's effort and practice, the techniques of kayak hunting also act as a framework for building personal experience. Through the physical process of learning to build kayaks and developing even some ability in their use, individuals develop personal experiences that run parallel to other kayakers – both in the present and the past.

4) Adaptable Knowledge

As a type of knowledge that must be re-created through the experiential learning of each generation in the community, kayaking is also something that is inherently impermanent and adaptable. The techniques of kayaking act as a framework for experience building, but because this is developmental knowledge, each individual's skill changes over the course of their practice and is never exactly the same as that of their teachers. For the Elders, when they were out hunting, they might use a particular technique that their parents had helped them to learn, but through practice, it became their own reactive ability. Over the course of their lives, hunters altered their practice, adapting to new situations they experienced, and in helping the next generation to also learn the skill, they added their own knowledge to the skill.

5) Kayaking as a Constitutive Part of Inuit Culture

Kayaking is of course not the only technology and skill that Inuit depended on as a hunting society. However, the process of recovering the skill reframed the relationship between
kayaking and heritage as something that was not simply symbolic of tradition, but rather was a constitutive aspect of Inuit culture. Through focussing on the physicality of learning in the Elder knowledge projects that *Qaannat Kattuffiat* was conducting, it was apparent their unique perspective of the world around them was strongly related to their experiences as kayak hunters. As with the skills involved in kayaking, there was an emerging sense that Inuit culture is not just a body of self contained knowledge that was passively transmitted between generations. It was sensory and experiential, and it was something that was re-created in part from the experiences of generations of hunters before, and in part from their own experiences. Kayaking contains types of knowledge that can only be acquired through practice; it is an important and constitutive part of Inuit culture and to lose the skill would also mean losing an important linkage to intergenerational experience.

### 4.5 Negotiating a Place for the Physicality of Kayaking in Modern Greenland

The main purpose of *Qaannat Kattuffiat* is to keep the Greenlandic kayak alive, that is the first priority. The next priority is the development of the kayak. Along with those important priorities is the use of the kayak as a sport. Those 3 are the main goals and purposes of *Qaannat Kattuffiat*.

Niels Thomassen, President of *Qaannat Kattuffiat* (2011) *ML/MJP*

Through the process of rebuilding a skilled community, *Qaannat Kattuffiat* became focused on the physical process of learning kayaking as something that was meaningful and relevant to contemporary discussions of heritage. Kayaking is adaptable, but contains aspects of heritage that are intangible and cannot exist outside practice; it was important that the physicality of kayaking persist even though it was no longer the primary means of subsistence. Kayaking is inherently adaptable, and *Qaannat Kattuffiat's* efforts to recover the skill are not based on nostalgia or reviving the totality of traditional life; rather, the objective is to develop a place for the skill because it is an important vehicle of continuity in experience linking Greenlanders to a heritage of environmental interaction.
The 30 year development of Qaannat Kattuffiat has been a succession of deliberate measures enacted by the community to encourage participation through local clubs that focus on practice. There have been many revisions of the skill as it is adapted from subsistence living to a more recreational context. There have been some adjustments in the types of materials that are used in construction, the clubs have opened participation to all ages and both genders, and the techniques have been adapted into a popular sport. The challenge for Qaannat Kattuffiat has been to adapt the skill while maintaining some fidelity with the experiences of kayaking as a hunting skill. The adaptation of kayaking into the day-to-day practices of the clubs today has been developed through a careful process of community negotiation, adaptation, and reflexivity.

4.5.1 Development of Kayaking as a Sport and the Annual Competition

To demonstrate this process of negotiation, adaptation and reflexivity, it is useful to specifically examine the development of kayaking as a sport and the creation of the annual competition, because it is one of the most visible ways through which kayaking has been adapted and transformed. Qaannat Kattuffiat's most successful venture in terms of increasing participation in the practice is the development of traditional skills into a sport. The development of the sport is something that has been engineered to set goals for kayakers that encourage specific types of experiences, training, and fitness. The first competition was hosted in 1986, and it is something that has gotten bigger and more structured ever since.

The competition is an annual event that is hosted in a different community each year—most frequently in the larger communities like Nuuk, Sisimiut, and Ilulissat due to easy access by Sarfaq Ittuk\(^20\). The competition usually lasts for 10 days and can attract up to 200 competitors and their families/supporters who travel from different communities around Greenland. As the competition has grown over the years, it has become the event that structures the calendar of day-to-day activities for Qaannat Kattuffiat. Throughout the year, the local clubs run fundraisers

\(^{20}\) Sarfaq Ittuk is the ferry that visits each of the communities in West Greenland on a weekly basis.
Figure 18 Competition events involving a high degree of publicity. 1) Competitors arriving on Sarfaq Ittuk unload their kayaks while the crowd watches. 2 & 3) Flag procession to mark the opening ceremony. 4) Mimi Karlsen, Minister for Culture, makes a speech at the opening of the 2010 competition in Nuuk. 5) Aalibak Agustussen narrates the competition from the KNR news boat. 6 & 7) Awards ceremonies for winners of events. 8) Medal ceremony for the long distance race (Ilulissat 2009).
to send their team to the competition. During the winter, competitors adjust and repair their kayaks or build new ones according to their experiences from the previous year, and practice the allunaariaqattaarneq (rope exercises) at the club houses during the long evenings (see Figure 20). As spring approaches, kayakers start training for specific events, doing endurance runs, building their fitness and practicing their rolls. The competition has been very effective, not only for increasing participation, but also to give individuals a point of focus in their practice. Individuals try to improve their skill and develop goals that they can work towards using the previous year’s scores to better their own marks. For example, Jørgen Leander, a kayaker from Sisimiut who works for Air Greenland, states:

If you want to be the kayak champion of Greenland, you have to use the traditional kayak. Maligiaq offered to help me to build a kayak. So I built a kayak and started competing in the championships... in the beginning I didn't know how to train for kayaking. I mostly did push-ups... We started kayaking to Assaqutaq doing short sprints as well, learning to read the waves and how to paddle on them. Every year I look back on the previous year and look at my strengths. I analyze my strengths and figure out what I need to improve on in order to become a better kayaker for the next season.

Jørgen Leander (2011) ML

The competition has also been designed to function as a spectator sport and has become a high profile national event usually covered by KNR – often with Aalibak Augustussen (previously introduced) as the chief commentator. Most of the events are carefully planned so that they are highly visible in the community, starting with the arrival of the competitors on the Sarfaq Ittuk (Figure 18). The competition starts with a procession through the hosting town – the teams wear the formal traditional clothes and carry the Greenlandic flag to the local church where there is a ceremony followed by a prayer dedicated to the many ancestors who died when they were out kayak hunting. The opening ceremony is often followed by a speech from the

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21 An abandoned community near Sisimiut.
Figure 19 Scenes from competition events in Ilulissat 2009. 1) The harpoon throwing competition. 2) The rolling competition. 3) The start of the men’s long distance race. 4) Kampe Absolonsen and Jenseraq Amondsen judging the rolling competition.

<table>
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<td>Naatsumut Parruneq</td>
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<td>Atuasiaakkaarluni Kinngusaqattaarneq</td>
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<td>Illiggiiluni Kingusaqattaarneq</td>
<td>Team Rolling</td>
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<td>Naakkiarmertqeqsaanneq</td>
<td>Harpoon Throwing (Distance)</td>
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<td>Roraajuneq eqsaanneq</td>
<td>Harpoon Throwing (Precision)</td>
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<tr>
<td>Allunaariaaqattaareq</td>
<td>Rope exercises</td>
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Minister of Culture. Throughout the competition, the events draw a large crowd, and there are regular Olympic-style awards ceremonies. The champions that win in *Qaannat Katuffiat* achieve a degree of fame and most Greenlanders know and recognize champions like Maligiaq Johnsen Padilla.

At the competitions, the different rolls and techniques are the ones used by our ancestors. We know that our ancestors used to have their own competitions – back then, they chose the best hunter. Today at the competitions we choose the best kayaker.

Niels Thomassen (2011) *MJP/ML*

The competition consists of a variety of events including emergency rolls, short and long distance races, harpoon throwing, and rope exercises (Figure 19 & Table 3). Within these categories there are many different events, where competitors of all genders and ages (from 4 years to early 60s) can participate. In general, the competition categories that are the most dramatic and draw the largest crowd are the young (20-34) men's and women's events – especially the rolling and harpooning. In general it is expected that the men's category performs better, but this has been changing, and there are a few women who are becoming very good in the rolling and ropes exercises in particular. Each event is an opportunity to earn points that are totalled up at the end – for each event there is a single winner, and there are individuals who excel at particular categories. However, the top achievement that people compete for is the 'Kayak Man of the Year' and 'Kayak Woman of the Year', given to the best overall kayakers and felt to be the best representation of hunting skill. As Jaffet Davidsen affirms:

I started kayaking in 2001 because my friends wanted me to try it. I like it, and I really enjoy the sport. We are three brothers and we all kayak. We like to compete against each other, maybe not in an obvious way. We like to see who has improved every year at the championships. I think it was an important tool for our ancestors and they struggled a lot in the waters. I don't want the culture and techniques to be forgotten – I try to compete in all the different competitions to honor them.

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22 Maligiaq has famously won the title ‘Qajaq Man of the Year’ a total of nine times.
The competition is also an opportunity for members of Qaannat Kattuffiat to meet and discuss the future directions of the community. The board meeting is held at this time and is made up of the committees for the local clubs, the President of Qaannat Kattuffiat (who is voted for each year), and Elders who were raised as kayakers or were involved in the creation of Qaannat Kattuffiat (Figure 21). During the meeting, members discuss the activities of the local clubs, as well as the structure of the competition, the way that it is judged, and knowledge and experience that it is designed to communicate. They raise issues they are having with the rules, discuss the underlying ideas behind them, and vote on any changes. Membership in Qaannat Kattuffiat is generally fairly informal and is oriented towards positive participation. Qaannat Kattuffiat cannot directly control what happens in the day-to-day activities of the local clubs because it defeats the purpose of keeping the practice alive. The only thing that Qaannat Kattuffiat can change is the rules of the competition and the structure of how it is judged—the competition sets the standards that people work towards, and the rules are carefully designed because they have the capacity to encourage certain standards of practice at the local level.

Figure 20 The allunaariaqattaarneq (rope exercises) competition. Left – the men’s category. Right – John Pedersen coaches a young competitor while Jenseraq Amundsen marks his score.

Through this process of discussion, all of the competition events have a history of community input and design to test some element of ability or fitness that was an important part of kayak hunting when it was a subsistence skill. The events are built either to simulate actual hunting scenarios (this is most visibly apparent in the rolling and harpoon throwing), or to
Figure 21 Equipment rules and judging. 1) Niels Thomassen helps a competitor with their *tullik* before the rolling competition. 2) Malina Amondsen rolls, using the *tullik* and *aaqqatt* (seal-skin gloves) for protection against the cold water. 3) Kayaks are inspected by a judge 4) Seal-skin deck lines with antler paddle holders. Note that these mimic the amulets from the East Greenlandic kayak in Figure 15 – 1, Chapter 3. 5) Niels Thomassen adjusts his *akuilissaq* before a race. 6) A *Qaannat Kattuffiat* board meeting where the rules are being discussed.

demonstrate a particular type of fitness (as with the rope exercises and races). Even with the races, the routes are mapped out to sample the local navigational conditions – Ilulissat for example has to deal with ice filled waters, Sisimiut is exposed to the open ocean and has very
rough water with large waves, and Nuuk has very strong currents and winds. Contrasting the kayak competition to other sporting events in Greenland Aalibak describes how the rules were designed around specific experiences and knowledge from the Elders:

[The knowledge and experience of the old hunters] was very important for Qaannat Kattuffiat when it was forming, because we became the only sports federation that made all the rules for itself for the first time in all of Greenland. The traditional knowledge of the hunters was the fundamental principles for that. For that reason, Qaannat Kattuffiat was the first to develop their own rules. Qaannat Kattuffiat had their rules rooted in traditional knowledge. While other sports have to adapt to international standards, Qaannat Kattuffiat is free to make their own rules and keep the traditions alive. Here, if changes are to be made, members can make suggestions about what to change and why.

Aalibak Agustussen (2010) EMML

Equipment is one area that demonstrates how the rules of the competition are directed towards particular experiences. To compete in the competition, kayakers must have their own kayak that has been built using traditional techniques. Deeming a kayak ‘traditional enough’ is complicated by the plethora of local forms and styles. For Qaannat Kattuffiat, a kayak must be built using components that define Greenlandic kayaks as a whole including a number of critical components that are treated in much more detail in Chapter 5. John Pedersen notes that the unspoken objective behind the rules isn’t necessarily to limit the types of kayaks but rather to encourage builders to try working towards designs that reflect the general technical decisions that builders would have had to use in the past. However, there are many allowances that have been worked into the rules, to meet the practicalities of building in the present – while it would certainly be preferred that kayaks be made with seal skin, competitors can use canvas or nylon, which is much cheaper and easier to maintain. Competitors can replace the bone protective edgings along the keel with pieces of plastic and can include some metal nails and screws (although most avoid this, favouring lashing techniques).

Although these allowances have been made to ensure kayaking building remains practical and affordable, they are mitigated by small rules designed to try and maintain at least some of the traditional skin and bone working techniques. To cover the cockpit during the races, competitors
have to use the *akuilisaq* – a seal skin 'spray skirt' made with traditional stitching techniques (Figure 21—see also chapter 3). For the rolling, competitors must use a seal skin *tulik* (jacket designed to attach to the rim of the cockpit), the sewing and preparation of which requires a high degree of ability – only a few women in Greenland are able to make them anymore (Figure 21). If the kayaker wishes, they can use mittens for the rolling competition (as it gets very cold), but they must also be the traditional seal skin variety. Additionally, each kayak has to have at least eight of the seal skin deck straps used to hold standard hunting equipment. Each competitor is required to use their own harpoon – the fore shaft can only be made of bone, antler, or ivory, and any edging on the *narsaq* (throwing board) must also be made with these materials. The importance of traditional gear is note by Niels Thomassen, who states:

> If our ancestors had no kayaks they wouldn't have survived – we wouldn't have been here if it weren't for the kayak. Our ancestors got all of their food and necessities from the sea. The building techniques and methods of the kayak are important things we need to keep alive and pass on to the next generation. That is the main reason we keep building the same way our ancestors built. We also keep the hunting techniques alive by throwing, harpoons and rolling. We also use the same clothing, same material for gloves, *tuliit* and ropes. Those important tools and materials are kept alive by using them in the competitions by *Qaannat Kattuffiat*.

Niels Thomassen (2011) *MJP/ML*

There is not always agreement on exactly how specific experiences and knowledge can be captured through the rules of the competition. While often recognized as *Qaannat Kattuffiat*’s most successful venture, the competition can also be the most controversial. In general, most people in the kayaking community express certain reservations about aspects of the competition. The competition is the most visible and noticeable of the changes that *Qaannat Kattuffiat* as a community has developed. The large awards ceremonies, and attention on publicity, are particularly common sources of scorn even among those who are the strongest proponents of *Qaannat Kattuffiat*. Another reservation that has been voiced is the apparent homogenizing of local construction techniques for kayaks. As noted in Chapter 3, there was traditionally a great deal of regional variation in the types of kayaks that Greenlanders built.
While all have the same general components inside, Greenlandic kayaks can have very different performance characteristics, usually adapted to local conditions. Yet because everyone is using their kayaks to compete against each other in the same events, there has been a tendency for some of the local variations to converge as individuals build with racing conditions in mind rather than the environmentally-specific hunting scenarios that underlie the original designs. However, while most community members are critical of certain dimensions of the competition, there is a sense that it is the outcome of a long negotiation and that the organization is flexible and can be adjusted to address such issues. John Pedersen, for example, has overcome the issue of homogenizing designs by building multiple kayaks. He has one that he uses for hunting, and one that he uses for racing. Overall, the competition is felt to be a very positive development for Qaannat Kattuffiat:

Today we use the kayak daily and also keep our traditions alive at the same time. We use it mostly as a sport at Qaannat Kattuffiat, but we also keep important experiences and traditions alive. That's the main goal of Qaannat Kattuffiat, and we build the kayak the traditional way because we respect and honour our ancestors.

Niels Thomassen (2011) *MJP/ML*

4.6 Perceived Successes of the Community – Day-to-Day Activities & Community Composition

The building skills we give to the kayak builders here, we have that from our ancestors. And we pass that to the next generation. And maybe it's a little modified when we give it to the next generation but the roots are from the real roots.

John Pedersen (2010)

As with the competition, the broader history and development of Qaannat Kattuffiat has been a process of negotiation and careful development. While there is not always total agreement
within the community as to an exact way to ensure kayaking persists, there is a general consensus that any type of participation is welcome and encouraged. Indeed, *Qaannat Kattuffiat* has been very successful in developing a place for traditional kayaking in Greenland; the community that is learning the skills and participating is much larger and more vibrant than it was 30 years ago. The primary success of *Qaannat Kattuffiat* has been the development of an intergenerational skilled community.

Although the competition structures the pulse and pattern of seasonal events, it is the day-to-day activities that happen in the club houses that are pointed to as the backbone of *Qaannat Kattuffiat*. Today, the local clubs offer a strong context through which people can participate and learn skills as a community. The activities of the community centre around the clubhouses which provide a meeting space, workspace, tools and equipment, and facilities/equipment for training.

The dynamics of gender participation in kayaking are very different in the modern community than they were in the past. While the importance of skinwork in kayaking has been impacted by the inclusion of nylon and canvas coverings, women now build kayaks and learn
traditional hunting skills alongside men – they take leadership roles in the community and the number of women becoming skilled kayakers is growing. This is certainly related to broader changes in the meaning of gender in Greenland as a modern Inuit country, but it is also important to reiterate that the politics of participation in kayaking as a heritage practice are very different than they were when kayaking was primarily a subsistence skill. Although most of the practices currently emphasized by Qaammat Kattuffiat, were mostly male activities in the past – such as frame carpentry or harpoon throwing – women who participate in these skills in the present argue that it is not just the experiences of men that they are learning about.

Figure 23 Elder knowledge projects in local clubs. 1) Kristian Johansen shows his old harpoon line. 2) Kristian Johansen demonstrates how the unaaq harpoon works 3) Bebiane Isaksen demonstrates traditional sewing techniques for fixing a tullik.

On most days, especially during the evenings, there are community members at the clubs building kayaks and offering training to beginners. When someone joins a club, they start by building their first kayak. There are many community members who donate their time, and help newcomers find the right materials and start building their own kayak. As their first kayak takes shape, they practice with rope exercises and balancing boards, preparing for spring when they
can try it out. As they get better and develop their balance, more experienced members—who often are still learning themselves—help newcomers to develop the more complex skills like rolling or harpooning. Outside of training for the competition, most clubs organize recreational paddles and hunting trips where kayakers can get experience hunting from a kayak (Figure 22).

Since the early days of *Qaannat Kattuffiat*, when the skill was limited to a few knowledgeable Elders, the community has grown and there are many new nuanced levels of participation. The skilled community now comprises five discernible generations including skilled kayakers who have grown up within the modern kayaking context and have a high degree of ability (Figure 23 & 24). As more and more Elders have moved to the major towns for care, their numbers and participation in the clubs have increased. Many clubs run their own Elder knowledge projects and have Elders who help with activities like kayak construction. For the most part, those considered to be Great Hunters have passed on, but there are still many who grew up with kayak hunting and were themselves skilled hunters or were involved peripherally through activities like preparing and sewing skin covers (Figure 23).

![Generational chart demonstrating the levels of participation in *Qaannat Kattuffiat*](image)

*Qaannat Kattuffiat* is also a community in transition, and different generations in the kayaking community are assuming different roles. The number of Elders whose lifetime spans the decline of subsistence kayaking and the development of kayaking as a practice of heritage is declining, and most in the community foresee that within the next 10 years they will be gone.
completely. However, the community is well positioned to make that transition, and many of the founding members of the kayaking community, the ones who were new to the skill and interested in recovering it during the 1980s are now in their 60s & 70s and are moving into the role of the Elders. Their children, who they helped to learn the skill through the early Elder knowledge project, are now the leaders in the community who are determining its course. There is also a highly skilled generation in their mid 20s to mid 30s who began learning kayaking as children. While it will be a few years before they are organizing the clubs, they have moved into important roles as trainers. Most in the community recognize the importance of keeping the community vital, and are positive about the future of *Qaannat Kattuffiat*:

I think if we want to keep on with our traditional kayaks, persons like me and others in the club we’re trying to pass it on to the others... so I hope it will continue like it does now. Because I’m glad to, I’m glad to see that it’s how can I say, that people think it’s good that we in the clubs are really working to keep our heritage.

*John Pedersen (2010)*

I hope that the kayak will still be used 30 years from now. However, that depends on how well we teach the next generation. It is important that clubs all over the coast teach teenagers and kids how to build a kayak, and to do it well. That is very important for us if we are to keep the heritage alive.... The good kayak builders are the ones who have kept the traditions alive. We also need to thank the people who founded *Qaannat Kattuffiat*.

*Niels Thomassen (2010)*

1.7 **Self Rule – Heritage in a New Era of Adaptability & Resilience**

Since the early days of Home Rule government, the position of Inuit heritage in Greenland remains a topic that underlies social and political discourse. With the transition to Self Rule government in 2009, Greenland has achieved a greater degree of autonomy over its own
natural resources and international representation – there is a very real sense that the decisions that Greenland makes now will shape its future (Kleist 2009). As one of the places where effects of climate change are directly observable and immediate in their impact on people, there are many questions about how Greenlanders can develop their economy in a way that maintains sovereignty while at the same time emphasizing Inuit culture and long-term relationships with the environment. As with *Qaannat Kattuffiat*’s history, there is not always agreement about what heritage constitutes and how it should permeate decision making in the present. However, the dichotomy between traditional and modern, set up during the colonial period and catalyzed in the Danification and Greenlandization of Greenland, is constantly challenged by a rapidly changing political, social, and ecological environment. Nuttall (2010) and Hastrup (2009) identify a shift in the perspective of heritage in Greenland that overcomes these oppositions. Rather than a static and timeless view, some community leaders point to the inherent adaptability, creativity and resilience of Inuit culture, emphasizing that a Greenlandic perspective of modernity can deploy intergenerational experience as a basis for responsiveness and planning in the present (Nuttall 2010; Olsen 2010).

The people who participate in *Qaannat Kattuffiat* represent a cross section of Greenlanders. In addition to kayakers, they are carpenters, doctors, architects, politicians, business owners, students, etc. Their participation in *Qaannat Kattuffiat* is recreational in that it happens during their free time – but the skills and abilities they develop through kayaking play an important role in their activities outside of the clubs as well. The decisions they make in daily life are informed by the intergenerational experience and tacit knowledge that they embody through practice. Not everyone in Greenland kayaks, but as a high profile activity, the entire population is involved, if only peripherally. For example, through the competition, the developmental nature of skill and perception as something that must be re-grown in each generation is highly visible and televised. I would argue that kayaking plays an important role in redefining Inuit heritage to focus on creative adaptability and responsiveness to changing environmental and social conditions. Indeed, kayaking is never far below the surface of Greenlandic politics. During the course of my ethnoarchaeological fieldwork, the Minister of

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23 Even as I edit this Chapter in March 2013, *Siumut* has just won an election and is forming a coalition government to replace *Inuit Ataqatigiit*, and heritage has been a key part of the election.
Culture was Mimi Karlsen who is not only a kayaker and physical education teacher, but was formerly the President of Pegjigluittit Qajaq Manitsaq, and was a member of the board for Qaannat Kattuffiat from 2002-2008.

4.8 Discussion: Ethnoarchaeology of Enskillment in a Context of Praxical Heritage

The relationship between kayaking and heritage in Greenland is clearly a topic that could be the source of many ethnographies that explore diverse topics such as gender, Indigenous nationalism, or social responses to climate change – just to name a few. This dissertation is not able to do justice to any of these issues, and the objective here is simply to provide the basic social and political context of modern kayaking in order to establish its value for ethnoarchaeological interpretation. It is apparent in the history of Qaannat Kattuffiat that kayaking has been deliberately modified and adapted to ensure a place for the skills and traditions of kayaking in modern Greenland; kayaking in modern Greenland cannot be uncritically assumed to be the 'vestige' of an ancient tradition, which accords with Wylie's (1985) critique of the direct historical approach discussed in Chapter 2. As an inferential approach to understanding the past, archaeological interpretation must depend on a relational analogy based on underlying causal mechanisms that account for similarities (and differences) between Inuit communities in the present and the past.

Kayakers in Greenland today are producing new knowledge about the lived experience of their ancestors – they are learning about the past, and they are doing it through material culture. Although the types of knowledge that are being produced through this exploration are quite different, there is much overlap with the goals of archaeology in the sense of learning more about past processes. Indeed, it is evident in the history and development of Qaannat Kattuffiat the kayaking has challenged many conceptions about what Inuit culture constitutes and has played an important role in redefining the position of heritage in Greenland. Since its formation, Qaannat Kattuffiat has been engaged in a 30 year process of community reflexivity in order to better understand the relationship between Inuit culture, skill, and the environment. Through this
process of intergenerational reflexivity, the community has come to understand that the physicality of kayaking is a constitutive part of Inuit culture because enskilment draws individuals into a type of embodied subjectivity that is an important part of how Inuit traditionally perceive and respond to the world around them. As seen through the account of the early days of *Qaannat Katuffiat*, the community is learning much about the dynamics of the skill and how it structures intergenerational continuity.
Chapter 5
Kayak Construction as a Didactic Process

This chapter provides an ethnoarchaeological account of the technical process through which traditional kayaks are built in Greenland today. As outlined in Chapter 4, the kayaking community in modern Greenland is exploring heritage through practice—they are interested in types of cultural knowledge that are a part of the physicality of kayaking. Kayak construction—and specifically the carpentry of frame assembly—is an activity that has been emphasized as especially meaningful in this context. Building a traditional kayak is felt by the community to be *didactie*—a transformative and educational process that acts as a mechanism for developing intergenerational experience. Through construction, builders develop capacities for awareness and response that are an important part of their broader enskilment in kayaking, and they are drawn into the intersubjectivity of the community (Lave & Wenger 1991; Polanyi 1958). Indeed, learning construction from Elders during the early days of *Qaannat Kattuffiat* constituted the means through which the community first came to focus on practice.

Kayaks are a skin and wood frame technology, and as depicted in Figure 25, the frame acts as a tent-like structure that holds the skin (made from animal skin or fabric) in a particular shape with the minimum number of contact points. With some notable changes in construction materials and carpentry tools, the kayaks that are built in the modern community fit into the general pattern of construction visible in the archaeology and ethnohistory of Greenland. However, there is much room for variation, and the chapter begins by examining the emic criteria through which kayakers define Greenlandic kayaks—a topic that has received much discussion in the community. Traditional frame construction is then presented through a *chaîne opératoire* based account (as per Dobres 1999; Leroi-Gourhan 1993; Lemonnier 1992; Sorensen 2006), developed from interviews as well as observations made while working closely with several builders in the clubhouse at Sisimiut. This description accounts for the types of variability that are possible in construction, paying special attention to the process through which technical decisions made at one stage have a cascading effect on how the rest of the frame is built. In characterizing the process of kayak construction as a whole, it can be seen that builders
Figure 25 Skin on Frame Kayak Construction 1) kayak frame 2) kayak frame with skin covering

are not replicating a sequence of rules and measurements, or enacting an underlying cultural schema of how a kayak should be built (see Knappett 2011a; Van der Leeuw 1993). Rather, construction is an open process where technical decisions invoke both community and personal experience regarding the scenarios where a kayak needs to perform. For the community, kayak construction is an 'education of attention' that acts as a framework for experience (as per Brusemeyer 2009; Gibson 1979:254; Ingold 2001; Leroi-Gourhan 1993); by performing sequences of technical decisions that run parallel to those made by their ancestors, construction offers opportunities for perception and action that call upon the experiences of many generations of hunters.

The focus on technique and process apparent in the modern kayaking community is an area where overlapping interests in heritage with archaeology feel especially intuitive. Understanding the technical sequences through which artefacts were made, used, reused, and discarded is also an important aspect of archaeological interpretation (Dobres 2000; 2010; Lemonnier 1989). The chapter concludes with a discussion of the relationship between society, skill, and the environment, specifically commenting on understanding kayaking as a didactic process of intercorporeality. The discussion finds a particular resonance with Tim Ingold's
perspectives on workmanship of risk and taskscape which will be discussed in reflecting back on the process of kayak construction.

5.1 General Overview – Kayak Construction in Qaannat Kattuffiat Clubs

Kayak construction is one of the most visible activities that take place in the Qaannat Kattuffiat clubs on a daily basis. The clubhouses provide carpentry tools, storage, and workspace, as well as a community to help learn the techniques. On most evenings, the clubhouses are busy with people simultaneously working on different projects, including the construction and assembly of new kayaks, the adjustment and repair of old kayaks, or the building of kayaking equipment such as paddles and harpoons. In participating in the community, kayakers help each other and assist with the labour, offer advice, or watch and learn; construction is an opportunity for generational interaction, and Elders participate in construction projects, demonstrating how certain parts should be made and discussing the criteria that should inform technical decisions. Each clubhouse has many half-finished frames from people who have either started over having found there were too many problems, or never got around to finishing them (Figure 26). These abandoned frames sit in piles outside the clubhouse, or strung up in the rafters waiting to be finished or scavenged for parts. They provide a record of projects people have worked on and serve as examples through which builders can examine the fluidity of design and the types of decisions that are made as a part of construction.

Figure 26 Daily construction activities in the Qaannat Kattuffiat clubs. 1) Aalibak Augustussen discussing aspects of design in Sisimiut 2) John Pedersen showing the pile of unfinished kayak frames in Ilulissat
While the production of a technology is often considered to be a process well removed from its operation, there is no such division in kayaking. The difference between being a kayak builder and a kayaker is not clearly demarcated—they are considered closely related and mutually constitutive. There are three distinct phases through which construction plays an important role in a person's broader enskilment:

1) For beginners, kayak construction is usually the starting point for a person's entry into a community that is formed through practice. Because kayaks are highly personalized and designed to perfectly fit a specific individual's body and level of ability, it is difficult to participate in community events and develop kayaking skills without building a kayak first. Beyond this basic practicality, construction is emphasized by the community as a starting point because the process develops capacities for awareness and response that are an important aspect of becoming a skilled kayaker. In building a kayak, beginners draw on community guidance and experience to navigate the technical challenges and they simultaneously build their own experience. Through building, kayakers develop an intimate familiarity with the internal structure of their kayak and an embodied sense of the scenarios in which it should perform.

2) Having built a kayak, the next phase in a kayaker's enskilment is to learn how to use it. This is treated in more detail in Chapter 6, but it is important to note here the relationship to construction. Although far from skilled, beginners who have built a kayak already have developed certain abilities. For builders, the kayak is not just a 'terminal form' with performance characteristics related to its mass and shape; rather, performance can be seen as a network of structural components placed in relation to each other that articulates with an individual's ability and personal style. As the kayaker starts to practice, they find their balance and develop their ability; as they race, roll, and paddle in different conditions, they can feel how their kayak moves through the water. Performance characteristics such as stability,

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24 From here I will use 'terminal form' to discuss the physical properties of a complete and covered kayak (shape, mass, etc.) considered apart from the internal structure and network of structural dependencies on which these properties emerge.
manoeuvrability, and response to environmental conditions such as wind can be intuitively understood in terms of the process of how they are built.

3) As kayakers develop their skill, they apply their personal experience to construction – this starts with the repair and adjustment of their kayak or even through thinking about how they will build their next frame. The kayaks they build become even more personalized as they develop their own preferences. Gradually, as kayakers become experts – they pass on their knowledge and experience through discussion with other skilled kayakers and by helping beginners to build their kayaks.

5.2 Hunting Knowledge and the Generation of Design Variability

It is designed to resist climate and nature, no matter how harsh it may be. There are many incredible stories about incidents in which kayaks survived, even when the hunter themselves gave up and died, their kayak often remained in one piece. The kayak is a single person boat designed for all types of conditions and that is incredible.

Aalibak Augustussen (2010) EM/ML

The way that a traditional kayak should be built is a topic that is perpetually under discussion in the kayaking community. As documented in the brief history of Qaanat Kattuffiat presented in Chapter 4, kayaking in Greenland today is something that has been adapted through a careful process of community reconstitution and reflexivity of their culture and heritage. The community has made many allowances in terms of material sources and carpentry tools, but the design and technical sequence of construction – and specifically that of frame construction – is a process that the community has tried very hard to ensure persists. The way that kayaks are built is felt by the community to be very closely related to the experiences of generations of hunters who had a high degree of tacit environmental knowledge. The construction of a kayak involves many technical decisions; the rationale behind each of these is related to the scenarios through which a kayak must perform. So in teaching construction techniques at the clubs, it is vitally important for the community to assess the definition of a traditional kayak in order to ensure the
practice maintains some level of fidelity with the experience and knowledge of past Inuit communities. Aalibak Augustussen describes this as 'hunting knowledge':

When it comes to building kayaks, I try very hard to respect and honour the way I was taught... We were taught to build the kayak of the hunter and how to use it in a way that was meaningful to that purpose. A hunter's kayak was supposed to be without sound in the water – it isn't supposed to creak. Hunting is the main philosophy and purpose behind the methods we learned from our elders – the Elders would tell us "that is the way a Greenland kayak is supposed to be build"... When building a kayak the traditional way, including the hunting tools and clothing, every piece has meaning.

Aalibak Augustussen (2010) EM/ML

This definition of a traditional kayak isn't based on particular dimensions or a list of physical attributes related to the terminal form. As articulated in the quote from Aalibak, the line that delineates a traditional kayak is the type of knowledge that guides the decisions behind each piece. The construction of a kayak must be responsive to a variety of environmental criteria – as the kayak is built, each piece should be made from the knowledge of how it will perform in the frame during hunting scenarios. The example in Aalibak's quote is specific to stalking sea-mammals – each piece in the frame must be carefully fitted and lashed so that it doesn't creak, which could easily alert prey. A traditional kayak is one that has been built not through adherence to a particular schema, rather it is built through attention and responsiveness to very subtle aspects of the environment.

Our ancestors... told us that it should be built this way. They didn't tell me that this was 2mm too high or 3mm too low here or that a hole was too big. They were satisfied if it looked like a kayak and had performance like a kayak.

John Pedersen (2010).
Through the ethnohistory of Greenland, it is apparent that there were many local and regional styles that were subtly different\textsuperscript{25} – the boundaries of these styles are difficult to place, and in some communities, there were even hunters who had multiple kayaks that they used in different conditions and hunting scenarios (Petersen 1986). When asked about how a kayak should be designed, Kampe Absolousen uses the expression "water shapes the kayak" to express environmental responsiveness as the sources of this variability. The local conditions in which kayaks are used are highly variable along the coast. For example, the waters around the three communities where the fieldwork took place were very different. In Ilulissat, where Kampe lives, the area is protected from the open ocean by Disko Island (see Chapter 1 Figure 2). Although the water is sheltered, it is full of icebergs that calve into the ocean from a number of fjords. The coastline around Sisimiut is more exposed to the open water swell from the Davis Strait and can be very rough. Nuuk is in a more sheltered fjord but has very strong currents and winds. Each location along the coast is ecologically unique, and local hunting techniques are very different as a result. In interviews with Elders, it was often noted that that in the old days, when Greenlanders saw a distant kayak on the horizon, they could very quickly recognize where it was from just from the subtle aspects of its shape. This was perhaps not so much the recognition of 'type' as much as the interpretation of the scenarios of use that the kayak was built for, and the opportunities for action that the design afforded.

Skin-on-frame designs permit the potential for a great deal of variability; in building a kayak's frame, subtle changes in positioning, shape and size of the structural components can have a significant effect on a kayak's terminal form. Variability in the terminal form for kayaks is primarily oriented around several characteristics outlined in Table 4 and Figure 27. The interplay of these properties in a complete kayak, including sheer, rocker, deck profile, stem and stern profile, and chine angle, characterizes how it will move through the water, and how it will interact to other aspects of the environment such as wind. A kayak also characterizes the manner

\textsuperscript{25} Greenland kayaks (and Inuit kayaks across the Arctic) provide ample opportunity for 'splitters' and there have been numerous attempts at different typologies (Birket-Smith 1924; Petersen 1987). For example, in his comprehensive survey of over 104 Greenland kayaks in ethnographic/private collections from around the world, Harvey Golden (2005) distinguishes 13 types. In the same volume, Golden cites personal communication with Eugene Arima who sees a further 80 different sub types. Skin-on-frame designs permit the potential for a great deal of variability; in building a kayak's frame, subtle changes in positioning, shape and size of the structural components can have a significant effect on a kayak's terminal form.
Figure 27 General Kayak Design and Performance Variables (described in Table 4)
Table 4 General Kayak Performance Characteristics (Golden 2006; Petersen 1986)

<table>
<thead>
<tr>
<th>Variable</th>
<th>General Performance Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheer</td>
<td>Sheer is the curvature of the deck. Sheer helps the kayak in rougher conditions to slice through waves. Sheer also affects the performance of a kayak in wind, and can cause an effect called weather-cocking, where the kayak tends to veer or back into the wind.</td>
</tr>
<tr>
<td>Rocker</td>
<td>Rocker is the degree of curvature of the <em>kujaaq</em> (kee line) towards the tips of the kayak. Rocker impacts the manoeuvrability of a kayak. If the <em>kujaaq</em> is curved it will be easier to turn – especially in rough water. A flatter <em>kujaaq</em> on the other hand will track better, and will be more efficient in terms of speed, but will be less manoeuvrable. A higher degree of rocker also helps in rough water by making the kayak perform much smoother. Because the tip already sticks out of the water, the hull will not ‘lock’ into the movement of the waves. The rocker also cushions the kayak as it enters and exits the water between waves.</td>
</tr>
<tr>
<td>Length</td>
<td>The length of the kayak impacts the speed, tracking, and manoeuvrability. In general, longer kayaks will be less manoeuvrable, but faster. With a longer waterline, the displacement of water has a smoother transition as the hull moves through the water.</td>
</tr>
<tr>
<td>Chine Angle</td>
<td>The angles formed by the <em>kujaaq</em> and the <em>siannit</em> affect the stability, manoeuvrability, and tracking. In general a flatter <em>kujaaq</em> has more initial stability on still water, but loses this stability in rough waves, and can be pushed sideways by the wind. V-shaped hulls with a larger chine angle are more ‘tender’ or less stable in flat conditions, requiring the kayaker to balance on the keel. However, a V-shaped hull tracks better in rough conditions and is not as easily pushed sideways by wind. A paddler can also lean a v-shaped hull so that the <em>siameeq</em> acts as secondary point of stability. Because the <em>siameeq</em> has more curvature than the <em>kujaaq</em>, this can make the kayak easier to turn quickly.</td>
</tr>
<tr>
<td>Flare</td>
<td>Flare is the angle that the side of the hull forms after the <em>siannit</em>. Flare helps to deflect waves from swamping the deck of the kayak, and can also be useful in avoiding having the kayak pinned by ice.</td>
</tr>
<tr>
<td>Stem/ Stern Angle</td>
<td>Longer profiles (<em>niuqaqqortoq</em>) cut through rough water easier, and assist with getting the kayak out of the water – especially in conditions where the kayak is used at the edge of the ice floe. However, if the angle is too long, they can make slapping noises as the kayak moves through certain types of waves, alerting prey.</td>
</tr>
<tr>
<td>Aquuit</td>
<td><em>Aquuit</em> is the ‘skeg’ of a kayak – it can be built into the frame as in the example depicted, or it can have a ‘fin’ added separately. <em>Aquuit</em> can be incorporated to the design to improve tracking in windy conditions.</td>
</tr>
<tr>
<td>Deck shape</td>
<td>The <em>tartunakitsiq</em> shape is faster and allows for a narrower kayak. The <em>tartunakaqqorthq</em> shape allows for a shallower <em>kujaaq</em> line behind the kayaker. This assists in enabling the <em>aquuit</em> without decreasing the volume aft of the kayaker. It also allows the kayaker to carry items on the deck. Some kayakers say the shape of the deck profile affects the sound the ripples make as the kayak moves through the water.</td>
</tr>
</tbody>
</table>
through which a kayaker's body articulates with the environment. The design of a kayak must also be responsive to the individual that it is built for – it must be tailored to their body to ensure that it has the right contact points allowing them to manoeuvre, and it must be adapted to their level of skill and their preferences. Thus, no two kayaks are ever the same due to a complex interplay of factors in how they perform. Because of differences in body shape, weight distribution, and personal paddling style, no two kayakers will even experience a particular kayak in the same way – all of which are highly problematic in the creation of typologies.

5.2.1 Homogenizing Processes as Challenges for the Modern Community

Within this discussion of hunting knowledge as the generating factor in kayak variability, we can recognize Polanyi's continuum of explicit and tacit knowledge. Being favoured here is a tacit design, that is not governed by an explicit schema per se, but rather an intuitive sense of how each piece should function, based on personal and shared intersubjective experience. For the community, the index of whether or not kayak design is drifting too far from hunting knowledge is the homogenization of local variability.

One aspect of community discussion where this primacy of tacit knowledge in construction is made clear, is the topic of blueprints, or plans for kayaks. Since the 1980s there have been several publications about the way that a kayak is built, and there is some controversy in the community about the value of these works. For example, H.C. Petersen (1981; 1986) is a Greenland who has written several books that contain instruction on building kayaks, presented it in step-by-step accounts. The books were researched and written in the early days of Greenlandization and the transition to Home Rule governance in the late 70s and early 80s. Petersen conducted many interviews in the course of writing his books, and they were widely distributed in Greenland with the intent of making kayaking more accessible. They document the general pattern for the construction of a Kangaamiut style frame designed for hunting in the open ocean, outside of protected fjords (Petersen 1981). John Pedersen notes that while the books were instrumental for the early community and were valuable in this way, there is a sense in the community that the books also "did some damage" to the plethora of kayak types. They have contributed to a homogenizing effect – rather than building kayaks from tacit experience of local conditions and hunting techniques, builders following the books were just working towards technical specifications apparent in the literature.
Building a kayak from explicit knowledge, such as a blueprint, is effective if the goal is just to produce a kayak, but for the community it detracts from the purpose of building kayaks as a didactic process. I myself have used one of Petersen's (1981) books to build a kayak, and can attest to their effectiveness. Building from blueprints, in John Pedersen’s words, is a process of replication— the lines on the paper are the goal towards which the builder works (see also Ingold 2011: 210-211). Following blueprints changes the rhythm of kayak construction by breaking it into discrete phases, where one stage is complete when it matches the criteria of the schema before moving onto the next, and so forth, until a kayak is assembled. Likening this building process to assembling a certain brand of prefabricated Scandinavian furniture, Aalibak says blueprints are a 'Danish way of thinking' and what the builder ends up with is a 'model' that looks like a kayak, but does not have any of the meanings. Many others in the community echo this sentiment:

By not following the old ways, the kayak will become something different. That is why I am always discussing those things with builders today. If you aren’t building the kayak from this original way, it will become too altered — it will become something that isn’t a Greenlandic kayak, just a model.

Aalibak Augustussen (2010) EML

I use the experience that was given to me, I use that. I know there’s a lot of books, a lot of information out there — books, internet and so — but, I usually use that information I got from my ancestors who taught me how to build a kayak.... Here, you are just building a kayak, you’re not building a perfect replica, or so. The spirit of a kayak isn’t the same.

John Pedersen (2010)

Kayak construction in the club houses is very social; kayakers help each other with the labour and discuss aspects of craftsmanship and decision making throughout the process. There is no formalized system of apprenticeship or rules governing when a person should start learning construction, or who should teach them. For beginners the decision process of construction takes
shape through suggestions and guidance from other community members. The first kayak that a builder makes is never perfect – they generally have problems – but are built with the sense that as long as they are safe, there will be opportunity to modify, repair and rebuild once the builder develops some experience in paddling them.

Another challenge that the community faces in terms of homogenizing processes is the underlying tension between using kayaks – a hunting technology – in a sport. As noted in Chapter 4, the competition is one of the community’s most successful and controversial activities. Although the competition is intended to be a gateway to developing hunting skills, the competition has become the major focus for some community members. Some builders focus on the challenges in the competition as they build and adjust their kayaks. Here, kayakers are indeed being responsive to the environmental scenarios where the kayaking is being used, but it is moving away from the tacit hunting knowledge that is originally intended. As kayakers from all over the country are designing kayaks to compete in the same races at the annual competition, many of the local styles developed around locally specific hunting techniques are fading. John Pedersen notes that this is somewhat expected:

They know which kayak is faster. A straight kayak is faster than traditional kayaks... So, they build the same kayaks because they want to be faster. So, they’ve become more and more alike.

John Pedersen (2010)

Although this demonstrates responsiveness, it means that some builders are shifting their focus away from the hunting knowledge, and Aalibak senses that they are not passing on the type of tacit hunting knowledge that the community wants to emphasize. Although Aalibak feels that it is still a positive thing that people are building kayaks, these subtle shifts away from hunting knowledge are difficult for him to accept:

This way of building a kayak is sometimes difficult for us Elders to accept, after having learned to build from a hunting perspective. It is easy for me to spot the differences and possible errors. It is important to reflect over that hunters have developed the kayak over several hundred years.
5.3 *Chaîne Opératoire of Greenlandic Kayak Construction*

This section is an account of the general operational sequence of how Greenlandic kayaks are constructed; following the community’s emphasis, it focuses primarily on the carpentry and assembly of the frame. It is illustrated primarily through the activities of the kayak club, drawing on examples of events and scenarios from field notes created working closely with Aalibak Augustussen and other members of the Sisimiut kayak club during the 2009-2011 field seasons. As noted, there is inherently a great deal of variability in the process of building a kayak, and the decisions made in each phase of construction involve responsiveness to a variety of environmental and personal considerations. As seen in Figure 25, the frame of a kayak is a complex network of interdependent structural components, and from the selection of material to the shaping of each piece and fitting them together, the construction of any given kayak can involve hundreds of individual technical actions. Although there are distinct phases in construction, the preparation and assembly of a kayak isn’t necessarily a linear stage-by-stage sequence of events; some parts of the frame are dependent on each other and have a natural sequence of assembly, whereas other parts can either be prepared or added with many options in timing. Kayaks are often rebuilt, with pieces adjusted, repositioned and repaired over the course of their use, or even recycled and incorporated into new frames. It is important to emphasize that this account is based on kayak construction in the present, and one of the important differences from the technical practices of past Inuit communities is that it doesn’t include the skinwork involved in covering the frame. This is a limitation, especially given the interdependency of gendered skills and knowledge. The implications for understanding the community of practice – as well as my hope that this account will be expanded on in the future – will be discussed in Chapter 8.

5.3.1 Preliminary note on Greenlandic Carpentry

Kayak frames are built primarily from wood, and their construction is a process of carpentry. Carpentry in Greenland has changed throughout the colonial period, which can be
seen in the material assemblage of key historic sites that span the colonial period (e.g. Gullov 1997). When the first Thule migrants arrived in Greenland, their carpentry primarily involved 'split and wedge' techniques using a combination of stone and meteoritic/traded Norse iron knives/gravers, with antler/bone wedges (Alix 2012; Birket-Smith 1924; Walls 2012). To shape split wood, Thule carpenters would have used the ulimaat (adze) and savik (knife), both made of ground slate. In contrast to European carpentry, Inuit carpentry likely involved very little in the way of sawing techniques that cut across the natural grain of wood – there are some ethnographic examples of saws made from shark's teeth, but these seem to mimic European versions also available at the time (e.g. Birket-Smith 1924: 91). Other tools included slate chisels and the niggit (bow drill) (Petersen 1986: 17). In the colonial period, iron carpentry tools including knives, saws, drills, and nails were introduced through trade and eventually replaced traditional tools. Traded tools were often used by Inuit in very different ways than European carpenters would have used them, sometimes using hybrid carpentry techniques that included both traditional tools and European ones. Additionally, trade was also a new source of material, and the Royal Greenland Trading Department specifically imported milled wood that was ideal for kayak construction, including pre-made hoops for the pana (cockpit coaming) (Petersen 1981). For kayak builders in Greenland today, wood is readily available through lumber stores. The tools that are used by the modern kayaking community include a combination of hand tools (draw knives, carving knifes, chisels, drills, planes, and saws) alongside power-tools (band saws and sanders).

From an archaeological perspective, these differences in material sources and tools are the most visible aspects of modern kayaks that differentiate them from those represented in the archaeological record of Inuit culture. The use of lumber and modern carpentry tools is a concession for some people – it greatly reduces the amount of time it takes to build a kayak, making the practice more accessible. However, the carpentry of kayak construction still requires careful wood selection, and there is a degree of continuity in the technical challenges that modern builders face in construction even with modern carpentry tools. At all stages, building a kayak involves a great deal of dependency on the natural properties of wood.

[In the old days] we didn't know where trees came from – they came from Siberia, Denmark, Great Britain or somewhere. The driftwood that made it to Greenland was
called *aqissiat* and it was very important for our ancestors. They used it for trade, and it was an important part of transportation and house building. In the old stories, there are many cases where driftwood was so important and valuable that it cost lives – people have even killed just to obtain the right piece. The long and fine-grained pieces [*ikkeq, pingeq, and unaarsivik* (Table 5)] were worth a lot for families.

Aalibak Augustussen (2010) *EM/ML*

There is also continuity apparent in the terminology that Greenlanders use for wood in kayak construction. Greenlanders traditionally distinguish a multitude of wood types which are not necessarily synonymous with the species of trees from which they originate. These types are generally differentiated by properties such as weight, straightness of grain, colour, utility for specific carpentry tasks (Table 5)(Petersen 1986: 18-19).

**Table 5** Kalaallisut naming and description of wood types (adapted from Petersen (1986) & Walls (2012b), with input from Aalibak Augustussen 2010)

<table>
<thead>
<tr>
<th>Greenlandic Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Ikkeq</em></td>
<td>Fine grained redwood, easily bent once steamed</td>
</tr>
<tr>
<td><em>Pingeq</em></td>
<td>Reddish, light weight, but very strong – good for harpoon shafts and kayak <em>apunmat</em></td>
</tr>
<tr>
<td><em>Unaarsivik</em></td>
<td>Light driftwood with straight grain and few knots.</td>
</tr>
<tr>
<td><em>Qisuk Qaqortoq</em></td>
<td>Similar to <em>pingeq</em>, but not as strong and more buoyant</td>
</tr>
<tr>
<td><em>Uligilik</em></td>
<td>White wood, but not as strong or buoyant as <em>pingeq</em> or <em>qisuk qaqortoq</em></td>
</tr>
<tr>
<td><em>Kanunneq</em></td>
<td>Heavily scented, and retains strength when bent</td>
</tr>
<tr>
<td><em>Qasalluk</em></td>
<td>Weak redwood - perceived to have magical protective properties, and often used in amulets.</td>
</tr>
<tr>
<td><em>Orpik</em></td>
<td>Dwarf Birch – pliable and strong, good for kayak <em>tippii</em></td>
</tr>
<tr>
<td><em>Paarnaqulhat/Kakillarnat</em></td>
<td>Dwarf Juniper – pliable and strong, good for <em>tippii</em></td>
</tr>
</tbody>
</table>

For the community, the point of building kayaks in the present is to learn about past Inuit communities. Even though kayaks are built with modern carpentry tools, there is a strong interest
in the practicalities of driftwood use as well. Some builders have made an effort to incorporate driftwood in their frames and it is common to build the *tippit* from locally available *orpik* or *paaraqulluit*. Building a kayak, even with modern carpentry tools, highlights the inherent value of driftwood that would have been apparent to kayakers in the days when there would have been no other source of wood. For example, one Sisimiut kayaker often collects driftwood when he is out hunting, and he feels that in his life, he has never seen enough good driftwood to build a whole kayak. Aalibak noted he feels there would be much more to learn by building an entire kayak using all traditional materials from the tools to the skin, and expressed an interest in building a complete kayak using replicas of stone tools on display at the Sisimiut Museum.

In the construction of kayak frames, many parts of the frame are joined using either pegging or lashing. The lashing is usually completed using either nylon cordage which is readily available from hardware stores, or 'imitation sinew', which is a waxed polypropylene that is popular in leatherworking and can be ordered online. Cordage available through trade was used throughout the historic period, but a few of the older kayaks in the Sisimiut Museum were built with braided sinew or baleen cords. Some kayakers, having examined these, have experimented with using them, but in general lashing is done mostly with nylon or imitation sinew. The pegging is usually done using either wood, antler, bone, or ivory pegs hammered into drilled holes. Occasionally, some nails or screws are used instead, but most builders prefer using traditional materials for pegging.

5.3.2 General Phases of Construction

The actual building of a kayak starts with the assembly of the top deck, which consists of the *apummat* (gunwales) and *ajaavi* (cross pieces). As seen in Figure 28, the deck plays a determining role in most performance attributes of a complete kayak. From the deck, the hull is
Figure 28 Complete kayak frame with Kalaallisut names for components. (s) = singular (d) = plural when only talking about two (p) = plural when talking about more than two.
shaped, first by placing the *tippii* (ribs), which determine the depth and shape of the hull at each cross section. The *kujaaq* (keel) and the *siastii* (stringers) are then positioned and lashed onto to the *tippii*. The *tunersuit* (deck pieces) are then placed on the deck. In general, these are sequential, however, the order can be reversed from some pieces – i.e. the *tunersuit* can be placed at any point after the deck is completed, and I have seen some builders who build the *kujaaq* first, and then build the *tippii* after.

### 5.3.3 Apummat

The *apummat* are the primary structural component in a kayak – they hold the frame together, and everything else in a kayak is built off of them either directly or indirectly. It is ultimately the *apummat* that absorb the different stresses placed on the frame during normal operation of a kayak, from the resting weight of the kayaker, to sudden shifts and movements during specific manoeuvres or the impact of waves as the hull moves through the water. As the primary longitudinal members, the *apummat* determine the length of the kayak, and they play a critical role in the symmetry and shape of the hull. From observing the construction of several projects, and from personal experience, the *apummat* are the most difficult and time consuming stage of construction. The *apummat* have to be carefully crafted because all other aspects of the frame depend on them. Small errors or imperfections in their symmetry have a cumulative effect on all other parts – as the first stage of construction, they are also the most difficult to correct at a later point in the building process. For beginners, building the *apummat* requires a lot of direction and oversight to know if they have been constructed well enough and to foresee the potential effects of problems.

Because of their size and structural importance, material selection for the *apummat* is critical. The right pieces of wood can be hard to find, and so the *apummat* are usually the first difficulty in starting a new building project. As noted earlier in the chapter, the length of kayaks traditionally varied regionally, largely in association with particular hunting techniques and local conditions. A longer kayak tends to track straighter, requiring less corrections and can be much faster. Kayaks in the modern community tend to be a bit longer – usually between 5-6m depending on the region and the builder’s preference and size. The builder needs to decide how
long the kayak will be when they are looking for material. The *apummat* also have to be strong enough, and an example that Aalibak pointed to as being ideal measured 21mm in thickness and 83mm at their height (Figure 29).

**Figure 29 Apummat Preform Blanks: 1) Side view 2) Planks are ideally split form the same piece so that their grain is paired. 3) Scarfing technique for assembling an *apummaq*.**

The *apummat* must be the strongest part of the kayak, and the natural grain of the wood must stretch longitudinally from tip to tip; places where the grain intersects the side will be weak points that will snap first when enough pressure is applied. The grain must be as straight as possible and not veer or twist, and the wood must contain as few knots as possible. The straightness of the grain is also an important factor in that the two planks will bend equally. Even in a modern lumber yard it is quite difficult to find a piece that is the right size with a straight enough grain (Figure 30).

Experienced builders are always on the lookout for pieces of wood that will make a good set of *apummat* – even if they are not looking to build a new kayak in the near future, many kayakers have the material for the key structural components for one or two kayaks stored away. These can either be used for future kayaks or passed on/traded to other kayakers. Sometimes builders are not able to find wood of the ideal length and straightness. In these cases, they have to assemble each *apummaq* from small pieces that are bound together using 'scarfed' joints.
Figure 30 Grain direction in *apummat*

(Figure 29 – 3). It is apparent in the ethnographic and archaeological examples of kayak gunwale fragments that this was the primary technique before European lumber became readily available (see Chapter 3). If the scarfing is done well, and bound tightly, the *apummaq* will bend as one piece. Newcomers to the kayaking community are often offered pieces that they can scarf together or salvage from unused kayak frames.

Once the correct material is acquired, it is reduced to pre-form planks that are cut to length, but are wider and taller than their final form. This gives the builder room to adjust the planks and plane them, because the final shape, positioning, and form of the *apummat* cannot be determined until all of the *ajaawi* (cross pieces) are set. Ideally, both planks will come from the same piece of wood so that the grain inside the gunwale is shared by both pieces, ensuring that they will bend equally at the same places (Figure 29 – 2).

### 5.3.4 Preparing and Testing the Apummat

Because the *apummat* will eventually play a determinant role in the resulting symmetry of all other hull dimensions, it is very important at this stage to test the *apummat* to ensure that they are of equal strength. The way that the frame is composed is that the *apummat* are bound to each other at the ends, and then forced apart in the middle. The resulting tension – analogous to a drawn bow – is what holds the kayak together (Figure 31).
Figure 31 *Apummat temporarily forced apart in the middle and differential pressures*

If one *apummaq* is stronger than the other, then the shape they form when drawn will not be symmetrical – it will be straighter on the stronger side. An asymmetrical hull will have a significant effect on the performance of the kayak; it will not move through the water in a direct path and the kayaker will constantly have to correct the course. This would interfere with the functionality of the kayak in a number of different ways. In terms of travel, hunting or recreational trips can involve many hours of hard paddling; during a trip, kayakers often have to make quick decisions that require bursts of speed, to reach safety during worsening weather, or to outpace moving icebergs – constant course corrections would exhaust the kayaker which could be very dangerous aside from the inconvenience. Additionally, a symmetrical hull is a necessity for most hunting techniques. Stalking sea mammals can require careful manoeuvring to position the kayak in the right place. The general technique is that the kayaker stalks the seals from a safe distance at the periphery of their zone of sensory perception. Having lined the kayak up with a path that will bring them into harpooning or shooting range, they carefully choose the right moment to strike. The kayaker then paddles a few careful strokes so that the kayak will 'glide' into striking distance. Course corrections made necessary by an asymmetrical hull will compromise the hunter's position and alert the prey (Figure 32).
As depicted in Figure 33, the strategy for testing the *apummat* is to bind them together at the ends and then force them apart at the middle using a temporary piece. From this state, it will be possible to see if the *apummat* will bend equally or not based on the resulting shape. In general, most are not at first symmetrical, and will need to be further refined so that they are equally strong. The strength of wood is determined by its grain rather than thickness – so any strategy to adjust the strength of one piece is a question of reducing the grain of the stronger piece. This can be accomplished by planing, or sanding the stronger of the two *apummat*, and if the carpenter is skilled enough, they can actually reduce the plank one grain at a time. Each reduction of the grain in the stronger gunwale weakens it a measure so that it will move closer to
matching the other. At each stage of reduction, the *apummat* are retested and adjusted until they are adequately symmetrical.

Equalizing the *apummat* is a process of testing, adjusting and readjusting; this is often a point of frustration for early builders who are eager to see their first kayak develop and take shape. I witnessed much discussion about the status of the *apummat* at this stage, especially regarding the level of symmetry attained and the degree that small imperfections might compromise the performance of the kayak. In one particular episode in Sisimiut, a new builder, aged 15, was starting his first kayak with the help of an experienced kayaker in his 20s. He had been working on the *apummat* for several afternoons straight, and it was not going well. The *apummat* were not matching each other; they had not been split from the same piece and the one had a difficult knot that made the *apummaq* stiffer towards the front. After becoming quite exasperated with them, the builder became confident that the *apummat* were bending symmetrically. However, the experienced kayaker was certain that they weren't quite equal enough and was concerned it would be difficult to shape the hull later on. After much discussion, they finally agreed to show them to Aalibak to see if the new builder was ready to move on to the next stage, but Aalibak agreed it wasn’t. It was suggested that they flip the temporarily bound *apummat* over and trace out their profile on the floor with a pencil, then rotate the frame 180 degrees to see if it matched the outline. Indeed, the two profiles were significantly off – Aalibak thought this was very funny and teased the new builder about the extra paddling he would have to do on that side. However, Aalibak said the *apummat* were getting too thin and he shouldn't risk planing them down any further, and that the asymmetry was likely a result of the way the grain inside the stronger *apummaq* twisted around the knot. So using a knife, they scored a couple of lines into the gunwale along the side to weaken the plank without thinning it further, and it did the trick (Figure 34).

Aalibak referred to this incident several times in later conversations about the types of knowledge that are gained through the physical process of construction. He notes it is important at this stage to *struggle* with the *apummat* a little, and to feel the tensions between the two of them as they are drawn apart. There are very different forces in the *apummat* at different parts of the frame. Towards the middle, the pressure pushes in on the kayak, whereas towards the ends, it pushes out towards where it is bound. None of the lines are permanent yet, but it is at this stage that the builder can feel how the wood is going to hold the frame together (Figure 31).
5.3.5 Shaping the Apummat and Determining their Flare

Having ensured that each *apummaq* will bend equally, the builder has some choices to make in how the sheer of the deck should be shaped. The sheer line is an important aspect in the performance of a kayak. As noted in Table 4, sheer assists the movement of the kayak through waves and helps to keep water off the deck. It also raises the profile of the kayak and provides a surface of resistance against the wind which can affect tracking in bad weather by creating a situation called weather cocking. In the Sisimiut clubs, they tend to use designs from the area around nearby Kangaamiut, which have a profile called 'pequngasoolq' that is fairly flat around the cockpit, but tapers up sharply towards the ends (Figure 28). The sheer of the deck depends primarily on the *apummat* being offset at an angle to each other, or 'flared', so that when they are force apart in the middle, the tips which are bound together will pull up (Figure 35 – 5 & Figure 36). To refine the sheer so that it will be flatter in the middle around the cockpit, the *apummat* can be further shaped to have the profile depicted in Figure 35 – 1. The ends of the *apummat* are carved so that they can eventually be placed into the *tunnaaq* joint at a later stage of construction (Figure 35 – 3).
Figure 35 Considerations in shaping the apummat: 1) side profile 2) possible sheerlines 3) carved ends of the apummat so that they will fit into the tunnaq joint at a later stage of construction 4) bevelling the inside edge of contact at the ends so that they press flat together when the apummat are flared 5) cross section view of the flared apummat and bevelling the top edge so that the deck is flat.

At this point, the apummat are still loose, and the exact curvature of the sheer will only take form after the sequential placement of all ajaavi, but the builder can experiment with the apummat to get a sense of how it will look. To do this, they create angled brackets to pinch the ends of the apummat together at the ends, and they force them apart in the middle using temporary cross pieces that are angled (Figure 36). They can simulate the effect that the placement of different ajaavi will have once placed by tying ropes around the kayak, which are then tightened by twisting them around with a piece of wood (technique is visible in Figure 41 – 2). In Figure 36, a kayaker is experimenting with the shape of the flare – he has turned the
Figure 36 Assessing the angle of flare for the apummat. The frame is upside down, and the drilled mortises for the tippii are visible on the bottom edges of the apummat.

apummat upside down and is assessing the angle. In deciding if the sheer will be steep enough, he is drawing on his experience. In the kayak he built previously, the waves were often breaking on the deck and swamping it when he was paddling, so he is trying to make the sheer more pronounced without raising the centre of the kayak too much, similar to the sheerline depicted in Figure 37. When the builder is content with their sense of the sheer line the deck will form, they bevel the top edge of the apummat using a knife or a wood plane. This forms a flat point that the skin can later rest on, and also serves as a marker for the angle they wish to preserve (Figure 35 – 5). Additionally, the edge where the apummat contact each other at the ends is bevelled so that they can come together at a flat surface (Figure 35– 4).

5.3.6 Measuring the Placement of the Ajaavi and Drilling Mortises for the Tippii

In the building of a kayak, this is the last point when the apummat are loose and can be placed side by side; once the ajaavi are placed, apummat will be locked in position. There are
Figure 37 Jørgen Leander’s kayak (at Ilulissat 2009). The sheerline curves up towards the tips but is flatter around the cockpit.

several important stages of preparation that are best done by this stage. Because the *apummat* can still be placed side by side, it is easy to mark the placement of both the *ajaavi* and *tippit*. Aalibak says he usually waits until this point to measure these because there is no guarantee that the testing and preparation of the *apummat* will go well. Especially when teaching someone to build, a beginner can prematurely develop an idea of where the *ajaavi* and *tippit* will go, and assume that any imperfections in the symmetry of the *apummat* can be dealt with through placing the *ajaavi*.

The position of each *ajaaq* is dependent on the kayaker’s body, and the placement of the *pukkut* (mortised joints that intersect the *apummat*) are marked out with a pencil. The number of *ajaavi* can vary a little, but in general there are about 6 in front of the cockpit and 5-6 behind. The placement of the *ajaavi* determines where the kayaker will sit in the kayak. Therefore, they have to placed in such a way that the kayaker will be positioned slightly behind the midpoint of the *apummat* so that their centre of gravity will balance the kayak with their legs positioned forward. Several *ajaavi* act as points of contact with the kayaker’s body, and the position of these is a very important factor in controlling the movement of the kayak in certain manoeuvres such as rolling. As shown in Figure 38, the key *ajaavi* are the *isserfik* (backrest), *seegortarfik* (first cross piece), and *tukermiaq* (foot rest). It is important that the kayaker be able to rest their toes bent upwards on the *tukermiaq* so that they can easily apply differential pressures, and that it
Figure 38 Measurements for the ajaavi based on points of contact with the kayaker’s body

should be placed so that the kayaker's legs are very slightly bent so that their thighs and outer knees rest against the sides of the apummata. If it is fitted well, the kayaker has a lot of control over the kayak through their core muscles, outer thighs, and toes. The spacing for the rest of the pukkut is then distributed fairly evenly with some variation sometimes incorporated to slightly adjust the shape of the hull.

This stage is also a good opportunity to drill mortises for the tippii because it is easier to line them up and ensure the mortises are evenly placed before the apummata are fixed in place. The distribution of the tippii is usually evenly spaced, and the number can be variable (I have seen examples that have between 16-24). In general, the spacing is usually coordinated with the placement of the cross pieces so that the kayaker's weight is distributed through one or more tippii. Regular spacing of the tippii helps to evenly distribute the force of an impact against the hull. The mortises are usually hand drilled about 3-4cm through the bottom of the apummata, and then chiseled into an ovoid shape about 2cm across – these are visible on the bottom of the apummata being prepared in Figure 36.

5.3.7 Preparing and Placing the Ajaavi

The final stage in building the top deck of the kayak is to place the ajaavi and to join them to the apummata using joints called pukkut. The ajaavi determine the width of the kayak at
each cross section and hold the apummat in their flared position. Material selection here is also an important part of building the ajaavi, but not as critical as it is for the apummat. The cross pieces must be robust enough to handle a number of different pressures. There is the inwards and outwards forces that is placed each ajaaq by the tension of the apummat. Ajaavi must be able to dissipate any impact from the sides of the kayak, along with torsion placed on the hull through the normal movement of the frame through rough water. In particular, the issersilik, seeqortarfik, and tukermiaq must be strong enough to withstand the sudden pressures placed by the kayaker's body as they control its movements. The cross pieces must be able to bear loads placed on the top of the deck, such as equipment, occasionally passengers, and most commonly, the weight of the kayaker as they get in and out of the kayak. As with the apummat, the ideal is to also have straight grained wood, but because of the size, it is much easier to procure material for the ajaavi.

Before the ajaavi are prepared, the plan view shape of the deck must be considered. There are a variety of shapes that the apummat can take which affect the way that the kayak moves through the water. For the kayak depicted in Figure 28, the apummat have a pinched outline towards the front, and a more convex outline towards the stern. This shape is called 'tartunagqortoq', and it allows for an increased volume in the aft section of the kayak while keeping a shallower hull behind the paddler (Figure 27). Later in the construction, this permits the kujaaq line to taper up, creating rocker or the aquut if desired (Figure 27). The alternative is a double pinched shape called 'tartunakitsog', which is felt to be faster, but requires a deeper hull behind the kayaker to compensate for the volume lost where the apummat narrow.

To place the ajaavi, the apummat are laid out and bound at the tips, as with the testing phase of their preparation. Starting at the middle, and proceeding outwards, the ajaavi and the pukkut are usually built sequentially as each joint is formed (as opposed to pre-building and placing them all at once). This allows the builder to customize each one to the specific cross section and to make adjustments that affect the shape of the deck as it is built. Each ajaavi is
Figure 39 Ajaavi and pukkut preparation. 1) Pukkut are chiselled into the apummat approximated 1 cm below the top edge. 2 & 3) Each ajaaq must be carved so that it will hold the angle of flare and shape of the apummat. 4) Cross sectional view of how each pukkoq holds the angle of flare for the apummat. This example is the fully locked version common around Sisimiut. 5) A cross sectional view of the 'half-locked' strategy. 6) The ajaavi determine the width of the kayak at each cross section. 7) The measurement of the seeqortarfik determines the maximum width of the kayak and is usually the hips of the kayakers plus a fist on each side.

chiselled into the apummat so that it will hold the desired angle of flare at that section (Figure 39). The angle of flare can change along the length of the apummat, so waiting to carve each pukkoq until the previous ajaaq has been placed allows the builder to adjust the sheer line as it emerges. Most of the ajaavi consist of a simple wooden slat with the grain running perpendicular to that of the apummat where they intersect. The two exceptions are the ajaat that sit immediately in front of the kayaker (seeqortarfik and seeqortarfik siulia), which are built with a cambered profile, allowing space for the kayaker's legs (Figure 40). The seeqortarfik determines the maximum width of a kayak, so it is usually placed first. The measurement for the seeqortarfik is taken from the kayaker's body. To maximize the kayaker's control, the kayak must
fit tightly, and the general measurement standard consists of the kayaker’s hips plus two fists at either side – although some experienced kayakers adjust this according to their preference (Figure 39 – 7).

The *pukkut* lock the angle of flare (Figure 39 – 4 & 5), and because they become weak points in the *apummat*, they have to be set at a position that will not overly weaken the top of the gunwale – usually at least a centimetre below the bevelled top edge of the *apummat* (Figure 39 – 1). There is some variability in how far the *ajaavi* are set into the sides of the *apummat*. In Petersen’s (1986) book, he depicts the *ajaavi* as being dug straight through the *apummaq*; Aalibak concurs with the effectiveness of this method, and it is generally the strategy used around Sisimiut. In this ‘fully locked’ technique, the tenon of the cross piece is then sanded off once placed so that it becomes flush with the edge of the gunwale (Figure 39 – 4). This procedure leaves the *ajaavi* very strongly locked into the *apummat* if they are carved so that they can be tightly fitted. Another option which some builders seem to favour is to ‘half-set’ the *ajaavi* into the *apummat* (Figure 39 – 5). In the Ilulissat area, this technique is more common, and builders say that it gives the joint a little more flexibility and preserves more of the *apummaq*’s strength.
Figure 41 Shape of the deck emerges sequentially as the ajavi are placed. Each ajaaq needs to be negotiated as it is placed, and then once everything is in place the frame is locked through lashing and pegging (6).
After the seeqortafik, the maximum width of the kayak has been determined, and the remaining ajaavi are placed, proceeding incrementally outwards starting with the issefik. As each ajaaq is placed, it must be decided what the width of the kayak should be at that cross section, and the angle at which the gunwale will be held. As the process of placement progresses, the pressures change within each apummaq. To create the desired deck shape, the apummat will have to be forced apart by the ajaaq at some sections, and pulled together in others. As more pieces in the middle are placed, it becomes difficult to manipulate the position of the apummat at the tips, and if there is a particular shape the builder wants at those parts, the end ajaavi are usually positioned after the placement of a few of the middle ajaavi. As the apummat are set, they are pegged if necessary, and at some sections they are lashed to the bottom of the edge of the apummaq to help hold the angle of flare (Figure 42). As the builder nears the final ajaavi towards the front and back of the kayak, it becomes increasingly difficult to squeeze in the next piece. Once all of the cross pieces are fitted, the frame is reassessed to see if any of the joints are loose and are pegged or lashed as needed. To finish locking the deck frame, the apummat are lashed and pegged together at their tips (Figure 42 – 2).

Pegging and Lashing the Apummat and Ajaavi

![Diagram of pegging and lashing](image)

**Figure 42** Pegging and lashing the top deck. 1) Cross sectional view. 2) Top view at ends where the apummat meet.
Shortcut for Placing the Ajaavi

![Diagram of Ajaavi placement](image)

Figure 43 A shortcut technique for building the pukkut joints. 1) Each ajaaq is pegged through the side of the apummaq. 2) Aalibak tests the frame by pushing down on the tunersuit with a wave-like rhythm producing a loud creaking sound.

Placing the ajaavi can be time consuming, as the builder has to consider at each pukkut how it will impact the shape and position of the apummat. One night when I was in the Sisimiut clubhouse with Aalibak, there was a frame left out that someone had been working on earlier. Aalibak noticed that they had developed a shortcut technique to skip the tailoring of the pukkut. Rather than carefully placing each piece, they had simply held each ajaavi in position, drilled holes through the sides of apummat and then pegged them in place with dowels (Figure 43 – 2). This provoked a strong emotional reaction from Aalibak – in his opinion it went too far over the line because the builder was being lazy and failed to build following the expected hunting scenarios that a kayak is designed to perform. It was clear to him that the builder just wanted to finish the kayak; it was quickly thrown together, and the only places where the builder had put some thought into the frame were structural characteristics which would enhance racing performance. Aalibak picked up the frame and squeezed it in different places pointing out how easy it could be to snap the dowels by just using his hands. He then put the frame on the floor and pushed down on the tunersuit with his hand simulating a wave-like rhythm, which produced
a distinct creaking sound. In his perspective, it would be impossible to hunt a seal with this particular frame, but this was obviously not a concern for the builder (Figure 43 –2). Later in a filmed interview Aalibak referenced the technique saying:

When that happens, I have to say truly, that is when I start to think, then what? Have the hunters taught their values and knowledge for nothing? That is how I feel about it. When the modern kayak builders stray from hunting knowledge, I feel like the old values are fading away. I believe we need to stick to the traditional building method. I have no problem with changing the materials. But if we change the construction, I see that as a violation of our cultural heritage.

Aalibak Augustussen (2010) EM/ML

5.3.8 Overview of the Top Deck

Once the top deck is locked, the first permanent lines of the kayak have emerged. The maximum width of the kayak has been determined as well as the shape and sheer of the apummats. Through lashing and the tension of the apummats, the top frame is tightly bound in such a way that it moves as one but with a degree of flexibility. The different forces in the apummats keep pressure on the joints, and if it has been made carefully and fitted well, the frame will be able to move a little without creaking. At this point, the builder can physically sit in the frame, and picture the way that it will move.

5.3.9 Building and Shaping the Hull

The hull adds the depth or third dimension to the kayak, and consists of the tippit, siannii, and kujaaq. These components shape the primary contact surface with the water, and as such determine many of the performance characteristics of a kayak. In cross section, a characteristic core to Greenland kayaks is that the hull assumes a roughly “D” to “V” shape (Figure 28 & Figure 44 –1). At all stages of building the framework that forms the hull, the builder needs to consider that it will be covered by a skin and submerged in water. The hull has
to be designed so that it will have as few contact points as possible, which can add unwanted drag (Figure 44 –3).

5.3.10 Tippii

The first stage in the creation of the hull is the tippii, the mortises for which have generally been measured, drilled and shaped during the construction and testing of the apummat (Figure 36). The tippii consist of wooden slats bent to create a specific shape at each cross section, and they act as platform for the kujaaq and the siannii. To install the tippii, the top deck is placed upside down so that the mortises face up.

Hull Components and Interdependence

Figure 44 Cross section images of a complete hull: 1) Interdependence of components 2) Contact points when frame is covered 3) Pressures on the skin when submerged.

Material selection is a very important part of building the tippii. The tippii have to be bent so that they camber into a "D" shape to form the shape of the hull at any given cross section, and it is important that they are strong. The preferred materials for the tippii come from some of the species of trees that grow as shrubs in Greenland – particularly orpik (Betula nana –
Figure 45 Tippii made from split orpik (example from Sisimiut).

Birch) and sometimes Parnaquulluit/Kakillurart (Juniperus communis –Juniper). Orpik and Parnaquulluit are very strong, yet their grain is pliable – especially when freshly picked, soaked, and heated. I have accompanied Aalibak to find orpik in the valleys around Sisimiut. Since the shrubs are small, finding enough pieces can be hard and time-consuming work. Up to 24 straight pieces of at least 60 cm in length need to be procured to provide enough tippii for a single kayak (in order to have room for error). Collecting orpik and paraquulluit involves spending a lot of time in sheltered creek beds which can be teeming with mosquitoes. Traditionally, orpik would have been bent into shape by builders using the teeth, and although I haven't personally seen people using this technique, tooth marks are visible on many of the frames sitting around the clubhouse in Sisimiut.
Although *orpik* and *parnaqulluit* are preferred, they are only available seasonally, and readily available lumber is used with more frequency. The hordes of mosquitoes involved in procurement also seems to deter more frequent harvesting of *orpik*. The store bought lumber includes softwoods (spruce, pine, and fir) and precut slats of ash that are commonly sold for furniture construction. Lumber is not quite as easy to bend as *orpik* and has to be steamed so that it will take the appropriate shape. Bending the *tippit* requires that the grain of the wood is as straight as possible (Figure 48). Places where the grain intersects the side of a *tippik* are likely to break during the bending process, and even if it can be worked into the correct shape, they will remain weak points in the frame (Figure 45–2). To assist with bending the ribs they are usually steamed either by using a large pot of water, or with a steam box.

![Diagram of Tippik Preform](image)

**Figure 46** Preparation and material selection from *tippit* preforms: 1) Grain must be straight 2) Places where the grain intersects the sides will be weak points. 3) general measurement is the width of the bottom edge of the apummat plus a hand on either side.
The *tippii* determine the depth of the kayak from the *apummat* at any given cross section and ultimately the rocker of the *kujaaq*. In placing each *tippii*, the builder must decide what the depth of the hull should be section by section. The first *tippii* to be placed are the ones that sit directly under the *seeqortarfik* and *isserfik*, because these will determine how well it fits the kayaker. A general reference measurement for determining this depth is to size the *tippii* so that it equals the span of the *apummat*, plus two fists. However, the effectiveness of this measurement will depend on the kayaker's size and musculature and decisions must be made at each cross section (Figure 22 & 24). Each *tippiik* is carved at the ends so that it can fit securely into the mortises on the bottom edge of the *apummat*. From placing the *tippii* in the middle, the builder works outwards towards the tips – as they build they use a flat piece of scrap wood to judge if the *tippii* are forming the desired hull shape (Figure 47). Each *tippiik* is unique and has to be tailored to the specific cross section where it is placed. Most are distinguished by a "D" shaped curvature at the mid section but this rounds off and becomes "V" shaped towards the tips (Figure 48 – 1). The *tippii* are carved at the ends so that they fit securely into the mortises on the underside of the *apummat* (they are not usually pegged or glued) and are eventually held in place through the *kujaaq, siannii*, and the inward pressure of the skin once tightly drawn around the kayak.

5.3.11 Tunnaq Joints & the Kujaaq
Before the builder places the *kujaaq*, they must decide how it will meet and transition into the *niutaaq* (stem and stern posts) and then *usuusaq* (end pieces), which together form the *tunnaq* joint (Figure 28). This will determine the stem/stern profile. The angles that these form with the *kujaaq* are an important aspect of how the kayak enters and exits the water (Figure 27). For areas where there is a lot of ice, many builders prefer a longer angle to the *niutaaq* called 'mutaaqportuut,' and this is said to allow the kayak to slide up on the edge of the ice if necessary. In a situation where collision with ice is unavoidable, it can also better ensure that the kayak's hull would be pushed up and onto the ice rather than caught and pushed under. However, if the angle is too long, it can cause slapping noises as waves hit against it.

**Figure 48** Factors that affect variability of *tippii* variability at each cross section. 1) Width between *apummat* and intended camber. 2) Height of *tippii* determine the *kujaaq* line.

There is variability in terms of how the internal joint is structured and lashed together (Figure 49). The tips of the kayak are an important point of contact in many scenarios of use; in forward motion they are the most likely to be impacted in a collision. If the kayaker needs to position their kayak to contact something, the impact will be first with the tips. For example, if a
Configurations of the Tunnaq Joint

Figure 49 Examples of *tunnaq* joints. 1) Complex example from Ilulissat. 2 & 3) Two examples from Sisimiut. 4) Example discussed by Aalibak.

A kayaker has capsized and is not able right them self, they can be rescued by other kayakers by placing the tip of their kayak perpendicular to the hull of the capsized one (Figure 75, Chapter 6).

The *niutaaq* and *usuusag* need to be able to withstand the pressures of these impacts. Designing the joint to consist of several components allows for some flexibility to dissipate stresses placed on the tip. The *tunnaq* joint also allows the tips of the kayak to break in a predictable way if they sustain a strong enough impact. The breakage will likely occur above the waterline within the joint, rather than in the *kujaaq* – while still very dangerous, it is possible the kayak would remain afloat, and the damage would be easier to repair than if the whole stem/stern were damaged. In some kayaks, the builder adds an additional piece called the *qalliusag* to
bridge the transition from the niutaaq to the apummat to provide a flat surface to use the tip to rescue other kayakers (Figure 28).

In the same kayak that Aalibak had pointed out the poor technique that had been used to replace the pukkut (Figure 43), he also noted that the builder had skipped building the tunnaq joint by simply using the band saw to cut out a single piece of wood that formed the stem (Figure 50 – 2). Aalibak felt that it could actually be quite dangerous, and as illustrated in Figure 26 – 3, the kujaaq was simply lashed to the bottom of the single usiusaq/niutaaq piece. When Aalibak
Tunnaq and Transition to Kujaaq

1. Kujaaq
2. Niutaq
3. Ususuaq

Figure 51 Options for the transition between the kujaaq and niutaq. 1) Kujaaq as a single piece. 2) Kujaaq as an extension of the niutaq. 3) Kujaaq is scarfed together.

pushed against it, the apummat and the kujaaq both looked as though they might pop out of their joints.

The design of the tunnaq must also take into account the transition from the niutaq into the kujaaq. While there is some room for variability in how these parts articulate, the main factors involved in the decision are the stresses that the joint is likely to endure, and the types of material that the kayaker has to work with. Most builders prefer that the niutaq comprise the entire transition angle between the tips of the kayak and the bottom (Figure 51). In some cases, if the builder has the ideal material the niutaq/kujaaq can be constructed from a single piece (see Figure 51 – 2 & 3. In most cases, the niutaq and the kujaaq are made from three pieces (Figure 51 – 1). In choosing the best strategy for a particular kujaaq, material selection is very important. The shape of the kujaaq in profile will be determined by the placement of the tippii, which will in most cases bend a little to create the rocker. As the kujaaq is the primary contact point of the kayak with the water, it can experience differential stresses when moving through rough water. Whichever strategy the builder decides to use, it is important that the grain of the kujaaq be as straight as possible, for the joints where the grain intersects the top and bottom of the kujaaq can be weak points. The kujaaq must also be tall enough to raise the skin of the kayak so that it will not touch any of the tippii, but the exact measurements are dependent on the hull shape that the builder wants to create (Figure 44 – 2 & 3).
5.3.12 Siannii

The *siannii* consist of two long pieces of wood that stretch the length of the kayak and sit on the *tippi*, forming the chine – the transition between the bottom of the hull and the side of the kayak (Figure 52). Together with the *kujaaq*, the positioning of the chine determines the shape of the bottom of the hull. To create a flatter hull, the *siannii* are positioned so the angle of transition with the *kujaaq* is less pronounced. A flatter hull is usually built for beginners because it tends to be more stable in flat water – the ideal conditions for training novices. With a flatter hull, the kayak has a tendency to sit level on its own and the kayaker doesn't have to keep the kayak balanced. While a flatter hull is more stable in calm water, it is very unstable in the wind or rough waters. Wind in particular can push the kayak so that it slips sideways when paddling across the wind (Figure 53).

![Placement of Siannii](image)

**Figure 52 Positioning the *siannii* in relation to the *tippi* and the *kujaaq***

A sharper angle of transition between the *kujaaq* and the chine results in a kayak that has less initial stability. A boat with a steeper chine angle will have a tendency to lean to one side unless the kayaker keeps it balanced with their core muscles. A "V" shaped hull is more 'tender,' and if the kayaker has a developed sense of balance, they can control the pitch of the kayak through very small changes in pressure and weight applied through points where the kayak...
contacts their body. With a sharper *kujaaq*, the *siannii* can also act as secondary zone of stability, assuming even the role of the *kujaaq* in a situation where the kayak leans to one of its sides. Because the *siannii* are much more curved than the *kujaaq* this instantly gives the hull more rocker and it will be easier to turn. A sharper *kujaaq* also helps the kayak to track better instead of slipping to the side (Figure 53 & Figure 54).

**Positioning of Siannii**

**Figure 53** Different hull shapes produced by changing the positioning of the siannii. 1) A 'V' shaped configuration. 2) A flatter hull.

Similar to the *kujaaq*, wood characterized by the straightest of grain is selected to build the *siannii*. In choosing the position for the *siannii*, builders temporarily hold them in place using ropes that are tied around the cross section of the kayak. With the *siannii* temporarily held in place, the builders can look at the angles formed by the *siannii* and the *kujaaq* and adjust them as necessary. In some cases, depending on the angle of flare produced in the *apunmat*, and
Figure 54. Aalibak Agustussen demonstrating how the kujaaq and siannii can be adjusted to create a different hull shape. The holes drilled for the qajaliutaanik lashing technique can be seen on the lower edge of the kujaaq.

depending on the desired shape of the hull, some builders add another set of smaller siannii, adding a second chine to the hull. However this technique is very rare, and seems to be related more to keeping the skin from contacting the tippii than enhancing the performance of the hull.

5.3.13 Qajaliutaanik

When the builder is satisfied with the hull shape that will be formed, the siannii and the kujaaq are attached to the tippii and locked into place. There are several methods that can be used to do this; the simplest is to peg them into place using either nails or dowel pegging. The preferred way, however, is through a lashing technique called 'qajaliutaanik'. In this technique, a small hole is drilled through the kujaaq and siannii at points where they contact the tippii. Then, using either long pieces of nylon cord or imitation sinew, they lash the joint together using a
special hitch knot (Figure 54 & Figure 55). The lashing is usually made starting somewhere near the middle and then proceeding outwards; this allows the builder to start by setting the chine angle under the cockpit first, and then readjust and position it at each joint. Qajaliutaanik holds the joints very tightly but allows a small amount of flexibility that is dissipated through the chords. Aalibak demonstrates the effectiveness of this technique by pushing down on the kujaaq and siannii of a well made kayak. Applying such pressure revealed that the frame was tightly bound together so that the siannii moved in concert with the kujaaq; the force from his push was thus spread around a number of neighbouring tippii rather than one in particular, like a very tightly wound basket. Most notably, he pointed out that the entire interdependent lattice was perfectly silent:

We were taught to avoid construction that would make creaking sounds and to tie all knots very tightly. I am not going to lie to you, when we first started building kayaks, the hunters made us tie them so tightly that we would go home with swollen hands. They would tell us how one small creaking sounds could alert the seal and make it impossible to go near it.
5.3.14 Hull Overview

Once the *siaa*niit and *kujaaq* are lashed to the *tippii*, the hull is finished and all of the terminal lines where the skin will contact the water are complete. At this stage, the builder can physically sit in the kayak, or push on different parts of the frame to see if it will creak or move as one piece.

5.3.15 Deck Pieces

The final stage in creating the frame of the kayak is to build and place the deck pieces including the *tunersuit*, the *masik*, and the *poaq*. These can be made and attached at any point after the top deck is completed, but they must be finished before the kayak covering is sewn (Figure 56).

![Deck Pieces](image)

*Figure 66 Positioning of the deck pieces*

5.3.16 Tunersuit

The tunersuit consist of simple supports that span the distance from the *seegortarfik* to the *tukermiaq* in the front and from the *isserfik* to next *ajaq* in the aft section. Once covered,
they create a smooth deck, that has some support for carrying equipment. The tunersuit can be either lashed or pegged to the ajaavi.

5.3.17 Masik

'Masik' means the 'gill of a fish', and it is a cross piece that is considered separate from the ajaavi. The masik is placed slightly aft of the seeqortarfik, and rather than attaching to the apummat through ajaavi mortis and tenon joints, it usually lashed to their upper edge (Figure 57). The masik arches between the apummat allowing space for the kayaker to fit their legs. The masik has to be quite strong because it bears the weight of the kayaker as they get into the kayak, and it gives the deck around the cockpit a rounded shape once the kayak is covered. The masik is usually much more robust than the ajaavi, and many have a small forwards facing handle carved into their underside so that the kayaker can pull themselves forward when getting in. To ensure that the masik is as strong as possible, many builders try to find material that has a natural grain curvature that follows the intended arc.

![The Masik](image)

**Figure 57 The masik (2) in comparison to the seeqortarfik (1)**

5.3.18 Paaq

The paaq is the cockpit coaming, or the hoop at the opening of the kayak. It is around the paaq that the tulik and akulisaq are fitted to seal the kayak once it is covered. The paaq is usually made from a single piece of wood that is bent the complete way around itself. To be bent around that far, it is critical that the material the paaq is made from must be as straight grained as possible. To build the paaq, builders sit in the kayak and use a piece of rope to approximate the
Figure 58 The paaq. Holes for sewing the skin to the paaq can be seen along the edge.

desired shape. Using this measurement, they carefully plane a piece of wood that will be long enough, and bevel the ends of it so that they can become facets, once the entire length of wood is bent. In the Sisimiut clubhouse, they have pre-cut templates around which the paaq can be bent. Once the wood is prepared, it can be steamed or boiled in water until the wood is very pliable. Bending the paaq can take a couple of attempts as it is very easy to split the wood while bending it. Once it is bent to shape, it is then pegged to itself, tied very tightly to the template and then left to dry. After the paaq has dried completely, a series of holes are drilled with regular spacing around its circumference so that the skin of the kayak can be sewn into them (Figure 58). The paaq remains loose from the frame and is not pegged or lashed to the kayak. It is eventually held in place by the skin. Because the paaq is quite difficult to build, it is a piece that is often recycled between kayaks.

5.3.19 Taqqaalersorfissai
For the most part, the construction of a kayak frame is complete at this point and the builder may make minor adjustments, pegging loose ajaavi or tightening the lashings etc. One final preparation made before the kayak can be covered is to drill the tagqat (deck straps, consisting of the tagqaasa and qasungasua, or front and aft deck straps) will be placed. The tagqat are very important parts of kayak and provide the critical rigging(?) through which equipment can be attached (Figure 25). In ethnographic examples of kayaks, there was a lot of variability in the number and format of the tagqat, and variability was primarily the preference of the kayaker. The rules of the competition is that they have to be made of seal skin and there has to be a minimum of 8; most kayaks have at least that many. The deck straps usually have a network of bone or ivory pieces that are used to hold equipment in place and to adjust the tightness of the straps (Figure 59).

Figure 59 Examples of tagqat. 1) An examples with intricate bone tighteners. 2) Several different configurations visible at the kayak rack in Ilulissat.

5.3.20 Covering the Kayak

The final stage of construction is covering the kayak. With very few exceptions, the kayaks built in the clubs today tend to be covered with nylon fabric as opposed to seal skin. While covering the kayak was traditionally a question of skinwork, and was a part of construction that was primarily conducted by women, both men and women sew the coverings
for kayaking in the modern community. The material is usually ordered in bulk through Denmark in strips long enough to cover the entire kayak. It is usually sewn using the imitation sinew as thread along a single seam down the centre (visible in Figure 59 –1). As the kayak is sewn, the tagqat are placed. At each tagqaalersorsfissar a small hole is cut through the nylon with a hot nail (which melts any frayed ends). The tagqat is then threaded through and any bone or ivory pieces are placed at this point. When the seam reaches the cockpit, the nylon is pulled up and through the paaq, and the extra material is trimmed using a heated knife to melt the edges of the fabric and prevent them from fraying. The material is then sewn to the inside of the paaq.

The skin of a kayak seals the boat, keeping the water out, but it also acts as an important structural aspect of the frame as well. Although the kayak frame is usually very stiff once complete, there will still be some loose parts that can pop out during normal operation, such as the tippit, which are not glued or pegged into place. The skin of a kayak acts as a structural component by holding the frame tightly together. Traditionally, when kayaks were built with seal skin, it would shrink after being sewn pulling all of the components of the frame very closely together. There are stories about how builders had to be careful not to sew the skin on too tightly, or let the seal skin get too dry, or it could actually crush the inside framework as it shrank. Like seal skin, the nylon used for construction also shrinks. Once the kayak is covered and sewn, it is soaked thoroughly with water ensuring that it is equally wetted, and then it is left to dry. The fabric shrinks during this process and if the seam has been sewn carefully, it will be drum tight by the time it is dry. To seal the nylon so that the kayak will not leak, it is coated with several layers of paint. Most kayaks are painted white, black, or brown. The paint is layered several times over until the texture of the fabric is no longer visible and it will move smoothly through the water.

5.3.21 Note on Skinwork

For Inuit communities in the distant past, one of the most important stages of construction would have been the preparation and sewing of the skins. However, because this is rarely practiced in the modern kayaking community, I have not been able to include a detailed description of the ecological knowledge and sensorimotor skill involved in skinwork in this account of the operational sequence of kayak construction. It is important to recognize this as a
shortcoming of the thesis, not just because it is the final phase of construction, but also because it would have been an important point of dialogue between genders. With a nylon covering, kayak construction is an activity that is easier to participate in as a recreational activity because a project can sit for any amount of time if necessary. Preparing seal skins to cover the kayak takes several weeks of work and preparation for depilation and softening the skin. Once sewn, seal skin coverings require constant attention and maintenance between paddling sessions and need to be replaced on an annual basis, so it is much easier and practical for kayakers to use canvas or nylon.

As discussed in Chapter 4, one way that the community has been working to preserve some of the skinwork skills is by concentrating on preserving the making of tutilik and akulisaq. Although I have left them out of this chapter, in order to concentrate on the construction of the frame, this project also included interviews with Bebiane Isaksen (Figure 23, Chapter 4) from Qaqortoq who is one of the few Elders who grew up with the skill of sewing, as well as Napaartoq Dalager, a younger woman from Sisimiut who has been trying to learn from her. The reason that I have left these interviews out is that they focussed primarily on the tutilik and akulisaq, and because I wasn't able to couple them with participant observation in the capacity that I was for the carpentry of the frame as described above. Interviews with both women will be archived with the project material at Nunatta Katersugaasivia (Greenland National Museum) – as will be discussed in Chapter 8, this is one part of the project that I hope will be expanded on in the future.

5.3.22 Niutaap Saanertai & Aquut

When the kayak is covered, the final stage in construction is to put protective edgings called 'niutaap saanertai' on the front and back of kujaaq (Figure 60). Traditionally, these were made of whale bone, and there are a few builders in the modern community who have made them this way. However, one of the rules in the competition is that builders can use plastic edgings for the niutaap saanertai if they wish. These form a protective layer and are especially important for putting the kayak into the water or where there is a lot of ice in the water.

Some kayaks have the aquut, or skeg built into the frame as depicted in figure 4. However, another option for the aquut is to build a detachable piece that can be affixed to the kujaaq through the skin once it is covered. – this helps the kayak to track better (Figure 60).
5.4 Characterizing the Process of Building a Kayak

In reflecting back on kayak construction as a process, there are a number of characteristics that are important to note as they will be revisited in Chapters 7 & 8. As suggested at the beginning of the chapter, specifically in the discussion of hunting knowledge as the basis of design, there is room for a great deal of variability in construction. There are many context specific contingencies to consider in building a kayak; considerations include the environmental scenarios through which it will need to perform, the skill and ability of the kayaker, and how the kayak should be tailored to contact their individual human bodies. The builder likely starts the process with some notion of a plan about the desired characteristics of a specific or imagined kayak (Keller & Keller 1996; Keller 2001). For experienced kayakers, this is formed through their tacit experience along with input from the community. For beginners, it might involve a combination of ideas that they have picked up through participation, along with guidance from experienced kayakers who know what type of kayak will match their skill.

However, having a plan does not pre-select a set of rules that are then enacted to realize the goal. In the sequential nature of how a kayak is built, decisions made at one stage have a cascading effect on how the rest of the frame is built (Leroi-Gourhan 1993; Van der Leeuw 1993). Deciding, for example, that the kayak should have a significant sheer along the deck means that the apummat will be set at a flared angle to each other. This affects the shape of the resulting hull; the ajjaavi must be carved to preserve the angle of flare and the tippii must then be tailored to create the shape of the kujaaq (and so forth). At all stages, there is no clear guide or
definition of when the task at hand is complete and the builder has to constantly adapt and respond to the cascading effect of decisions made at previous stages. Ingold (2011) refers to this as a 'workmanship of risk', borrowing the term from David Pye (1968). Workmanship of risk is where the outcome of a technical action is not certain. The builder has to negotiate between the inherent heterogeneity of the material, and the scenarios through which the kayak must perform; at every stage there is assessment, negotiation, response, and adjustment. The objectives shift as the material is crafted and pieced together. The design of a kayak is emergent through the process of building.

![Diagram of kayak construction]

*Figure 61 Workmanship of risk and the co-construction of tacit knowledge between the builder and skilled community through construction. In equalizing the *apummat*, a learner depends on the community of experienced kayakers to know when the stage is good enough to begin placing the *ajaavi.*

The process of learning to build a kayak is also a prime example of situated learning. For beginners, who do not yet have the tacit knowledge developed through experience, they must draw on advice to know if it is good enough. For example, in a single task like equalizing the
Figure 62 The chaîne opératoire of kayak construction conceived of as a taskscape.
apummat, a beginner must draw on the experience of the community (Figure 61). The community of experienced kayakers are able to draw on their tacit knowledge to intuitively know if the apummat are symmetrical enough, and if the builder is ready to move on to the next stage.

The entire process of construction, the chaîne opératoire, is made up of episodes like the equalizing of the apummat, and to draw further on Ingold’s terminology, the construction can be described as a ‘taskscape’ – a field of practice with journey like qualities, where opportunities for attention and learning open up through the action of a practitioner (Ingold 2000: 194; 2011: 59). Although the operational sequence has distinct phases, they are not pre-determined by specific criteria – they are tasks which the builder must work towards, adjusting their action and continually engaging perceptually with the material. Figure 62 attempts to depict the different paths of preparation, and assembly that each of the parts of the construction involve, which are in some cases not strictly sequentially ‘chained’ together – there can be many starting points for building a kayak although actual assembly starts with the apummat. Throughout the taskscape, there are definite ‘technical moments’ that require the ebb of co-construction and development of tacit experience between skilled kayakers and learners.

Completing the taskscape of building a kayak does not mean that one is an experienced kayaker – far from it as will become clear in the next chapter. But it is an important starting point for the development of the skill. Through construction, learners embody dispositions, and they gain an intuitive sense of how the kayak should perform, and the scenarios where it is designed to be used. For the community, building a kayak is a didactic process. Each task affords specific opportunities for perception and action, and although the entirety of the construction can take place in a workshop, the process has journey-like qualities. The taskscape enables a state of flow, where kayakers become absorbed in their work and through the feedback of the emergent frame, they can judge the effectiveness of their action. Kayak building acts as a mechanism for the co-construction of intergenerational experience. In the clubs, builders work alongside several generations of kayakers, and construction acts as a framework for experience. This makes the technology praxical it is inherently impermanent, re-grown, adapted and applied in new contexts – kayak building is an important aspect of participation in the community of practice.
Capsizing is a very dangerous and disorientating scenario, and one of many possible emergencies that kayakers must anticipate and prepare for whether paddling recreationally or for hunting. It is an event that is most likely to happen unexpectedly. One wrong shift of the muscles, a wave when the kayaker's attention is occupied on another task, or a mistake made while stalking/shooting/harpooning a sea mammal, and the kayaker can suddenly be upside down, plunged into frigid darkness, tightly pinned inside their kayak with cold sea water rushing into their sinuses. A capsize can take place when the kayaker is alone, far from land or possibilities for rescue. The consequences of mistakes that exhaust the kayaker through panicked flailing, or of being submerged for too long and letting water in through the tuilik can be deadly.

Skilfulness is critical in moments like the one depicted in Figure 63. The kayaker must instantly comprehend their situation and avoid panicking. They must resist the urge to flail or
push out of the cockpit, or to gasp for air, and they must control their movements and apply their tacit knowledge in order to right themselves. *Kinngusaqattaarneq* — the skilled reaction of a kayaker to roll their kayak to an upright position when capsized — is illustrative of what is meant by the term 'praxis' in this thesis; in the brief episode of a capsize, lasting no more than a couple of seconds, recalling a story about how one should act, or applying a memorized sequence of actions doesn't help the kayaker. There is no single procedure that will be appropriate in all situations, because in the abruptness of a capsize, there can be any number of situational contingencies that impact even an experienced kayaker's ability to roll. The kayaker might be separated from their *paattit* (paddle), or in the most dangerous scenarios their ability to move could be restricted through being tangled in the harpoon line or other hunting equipment. The kayaker must be able to simultaneously perceive and react creatively to the contingencies of the situation at hand.

Kayaking as a skill requires many sub-sets of sensorimotor ability, which can only be acquired through situated learning — a point already introduced in the discussions of harpoon training and kayak construction. *Kinngusaqattaarneq* is an example where tacit knowledge as a type of knowledge that cannot be transmitted, and can exist only through personal experience, and practice is especially clear. Like kayak construction, it is an element of skill that the modern kayaking community has emphasized as particularly important in terms of cultural heritage and understanding the lived experience of past Inuit communities. By focussing specifically on *kinngusaqattaarneq*, this chapter expands on the process through which complex capacities for awareness and response are co-constructed between experienced kayakers and learners. The chapter thus provides a detailed account of the learning strategies, personal conditioning, and social relationships involved in the co-construction of this particular skill.

Developing the ability to roll a kayak depends on situated learning, where practice must take place in scenarios where the technique is actually used. However, the process of learning is complicated by the reality that the scenarios where a kayaker may have to recover from a capsize are too dangerous for a beginner to learn through trial and error. Indeed there are many sub-sets of ability that must be developed before a kayaker can begin learning *kinngusaqattaarneq*. The skill requires the development of particular types of fitness and musculature, as well as dexterity and the ability to coordinate complex and subtle muscle movements in an environment where there are no stable surfaces to push against. *Kinngusaqattaarneq* also requires emotional skills
such as hardiness to deal with cold and uncomfortable conditions, calmness to react without panicking, and perseverance in rough conditions where the kayak is constantly overturned.

As will be developed in this chapter, co-construction of the skill is a process of simulation through the creation of mock environments. Simulation allows for the skill to be partitioned into sub-sets of ability that can be practiced and honed at first in isolation from each other before being assembled and coordinated. The process of learning begins on land by practicing a type of Inuit rope exercises called 'allunaariaqattaarneq'. Once a degree of fitness and coordination is developed, learners experiment with finding the tipping point of their kayak, and getting the feel for the resistance of the water against the paatit. Having developed some confidence in the water, they start by learning very basic rolls, where they have the paatit at the ready. When some proficiency with the basic rolls is developed, learners practice many different types of rolls that either simulate dangerous scenarios through which the kayak can be capsized, or are designed to develop their fitness. By practicing these in simulated environments, kayakers assemble their skill and the ability to adapt and respond – it is not just the internalization of procedures, but the development of embodied experience and intuitive response. In a real event of capsizing, where the kayaker's life depends on rolling, they must sense the situation and respond creatively to the contingencies at hand. There is no clear endpoint to enskilment in rolling, and even the most skilled kayakers can find ways to improve their ability.

6.1 Allunaariaqattaarneq (Rope Exercises)

*Allunaariaqattaarneq* – previously mentioned in the discussion of the *Qaannyaat Kattuffiat* competition in Chapter 4 – are rope exercises that are practiced as a means of developing personal fitness for kayaking. The exercises are performed on a set of ropes that are strung between two posts, and they consist of a series of different 'tricks' or manoeuvres that usually involve the kayaker rotating their body around the rope, returning to the position they started in. The exercises are practiced for general fitness, but they are most closely associated with developing the ability to roll a kayak because they require many of the same muscles and coordination of perception and action.
Figure 64 Historical depictions of *allunaariaqattaarneq* 1) An illustration redrawn from Hans Egede’s (1745:162) ‘A Description of Greenland’, from the area around Nuuk. 2) Stills of *allunaariaqattaarneq* from Knud Rasmussen’s 1933 film *Palos Brudafærd* (Palo’s Wedding) filmed in Ammassalik (in East Greenland).

Although *allunaariaqattaarneq* are virtually invisible archaeologically, the practice certainly has some antiquity. The rope exercises are noted in the ethnographic record of both East and West Greenland – most often as a sport in and of themselves practiced at regional social aggregations. For example, Birket-Smith (1924: 395-396) identifies a number of *allunaariaqattaarneq* by name from the Aasaiat area, which have continuity with the names for rope exercises in Greenland today – including several of the example discussed below. They are alluded to as games played at aggregations by even the earliest European accounts of Greenlanders (Crantz 1820\(^2\): 163; Egede 1925)(Figure 64).

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\(^2\) Crantz (1820: 163) for example, describes them as ‘rope-dances’.
6.1.1 Examples of Allunaariaqattaarneq

There are many types of allunaariaqattaarneq exercises, and they are divided into two configurations as dictated by the placement of the ropes — a high and a low position. The high ropes are set up so that they sag to a lowest point that is above head level, and the low ropes are usually placed further apart and sag to chest level. The tightness of the ropes, and the arc that they form, can be adjusted to increase or decrease the difficulty. The allunaariaqattaarneq are generally performed in rapid succession — in practicing them and using them to develop fitness, kayakers perform one exercise after another until they are too exhausted to continue. For the competition, Qaannat Kattuffiat has selected 74 particular exercises from around Greenland, and the competitors have 30 minutes to complete as many of them as possible. Most kayakers, even the best ones, are not able to do all of the allunaariaqattaarneq at once. Some of the more difficult exercises can take years of practice to master, and when strung together, the allunaariaqattaarneq are very difficult, tiring, and leave the kayaker with rope burns, bruises, and calluses.

The following presents a description of six different allunaariaqattaarneq that are fairly representative of the range of variants. Each of the following six entries also provides information on variations and possibilities for modification. There are, however, many more rope exercises, and individuals can create new ones to specifically target certain motions that a kayaker depends on for particular rolls.

6.1.2 1) Qajaasaarneq (low rope)

Qajaasaarneq is practiced on the low ropes, and is the exercise that most closely resembles kayak rolling — indeed, the term means 'rolling like a kayak'. In the basic form of this exercise, the kayaker sits on the rope which is held around their hips and under the knees (Figure 65). Holding the ropes together in front and behind, the kayaker then rolls around the rope, pausing at the upright position before rolling back the other way, unwinding the rope. Qajaasaarneq can easily be modified to make the kayaker use their muscles differently by switching the orientation of their grip on the rope. Other modifications make qajaasaarneq more difficult by completing the manoeuvre with a heavy backpack on, or by stopping the rotation.
Figure 65 Demonstrating a simple version of *gajaasaarneq*. The numbers indicated the sequence of the images. Between 1-3, Jensen rolls clockwise pausing at the top of the roll (4), before rotating counter-clockwise back to the starting position (7).

halfway around to pick up an object from the ground before returning to an upright position. Another modification is to continue rolling a specified number of rotation one way (as many as 5 rolls), so that the rope winds up, before rolling back the other way, stopping the rotation perfectly in an upright position on the final roll.
2) Singernermillugu/Tunuussineq (low rope)

Singernermillugu and tunuussineq are two separate exercises, but both start with the kayaker facing up, followed by the rotation of their body around the ropes which hang at their lowest point (Figures 4 & 5). The differences between the two exercises are related to where the hands and legs make contact with the rope. Singernermillugu and tunuussineq are necessarily slow and sequential in their performance – the positioning of the body allows for very little movement or leverage, and controlling the orientation of the body relies on very subtle movements and pressure on the rope from different angles.

Figure 66 Performing tunuussineq
Figure 67 Performing *singernermillugu*.

6.1.3 3) Nammaassaariarneq (low rope)

In *nammaassaariarneq* the rope is twisted around the arms and behind the back. The kayaker must then rotate around the rope returning to a hanging position (Figure 68). Variations in this technique can include the position in which that the kayaker initiates the manoeuvre—either from a standing or hanging position.

Figure 68 Performing *nammaassaariarneq*. 
6.1.4 4) Tiguinnarlugu/ Tigumisserlugu (high rope)

For *tiguinnarlugu*, the kayaker pulls themselves up and over the rope, returning to a hanging position. *Tiguinnarlugu* can be modified in many different ways to make the exercise very difficult, by changing the spacing of the hands so that they are touching instead of spread, or by switching the orientation of the grip. In the depicted example (Figure 69), Inuk Siegstad has reversed one grip. Another variation is that the kayaker must complete the exercise with their head remaining above the rope, demonstrated by positioning it on the chin (as depicted in Figure 69). A much more difficult variation is that the kayaker does not touch the rope with their body as they go around. *Tigumisserlugu* are also variants that are similar to the *tiguinnarlugu* (above) but have been modified and made more complicated by having one arm lowered through the use of a loop (Figure 70). These can be adjusted, and in the most difficult variants, both arms are lowered, but the kayaker still has to lift their body over the rope.

*Figure 69 Performing tiguinnarlugu.*
5) Qupaloraarsuusaarneq (low rope)

*Qupaloraarsuusaarneq* provides a good example of exercises that require a high degree of balance. The kayaker has to start the manoeuvre from a balanced position, standing on the rope in a squat position holding the rope tightly to stay upright (Figure 71). The position has very low stability; even at a resting position, it is very easy for them to tip forward. The kayaker then starts a swinging momentum in the rope and rolls forward. To carry the inertia of the roll and return to an upright position, the kayaker must swing themselves as they complete the manoeuvre, but they also have to responsively compensate for the movement to ensure they do not overshoot and end up rolling forward again. Having reached the upright position, the kayaker then unwinds the rope by completing the roll backwards, which is much more difficult than in the forwards motion.

6) Kisitsineq (high rope)

*Kisitsineq* is different than the other manoeuvres because it requires no movement at all. It is a test of endurance, and the kayaker places one hand on the rope and the other behind their back. From a hanging position, they must hold their chin on their hands for as long as possible (Figure 72). In the competition, there are points for every second that the kayaker can hold the
position. On several occasions, I have heard people watching someone perform the *kisitsineq* chant "*qivitsoq... qivitsoq... qivitsoq...* \(^{27}\) for as long as the kayaker can hold the position. Only a

\(^{27}\) A *qivitoq* is a hermit who has left their community – usually due to a dramatic social upheaval – to live alone in nature (e.g. Birket-Smith 1925: 450; Gronnow 2009). Through seclusion, *qivittut* (pl.) acquire a mythical quality, and possess great powers and strength. There are many rumours about the existence of *qivittut* in Greenland. Many people claim they have seen them while out hunting, and to call someone a *qivitoq* is a way of teasing them.
few people can perform *kisitsineq* for any length of time, and it can be made even more difficult if the kayaker is able to keep their chin above their fingers without letting it rest on them.

![Image of a person performing *kisitsineq*]

*Figure 72* *Kisitsineq.*

### 6.2 Simulation and Sensorimotor Development: The Relationship between *Allunaariaqattaarneq* and *Kinngusaqattaarneq*

In *allunaariaqattaarneq*, the ropes create an environment that simulates certain aspects of the physical movements involved in kayak rolling – most obviously where there is movement of the body around an axis. Through practicing *allunaariaqattaarneq*, kayakers learn how the coordination of subtle muscle movements affect the orientation of the body in an unstable environment. Through the exercises, kayakers develop coordination, dexterity, muscle strength, endurance and hardiness. These are especially helpful in developing the ability to roll a kayak,
<table>
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<tr>
<th>Classification</th>
<th>Description</th>
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<tr>
<td><strong>Environment of Performance (open/closed)</strong></td>
<td><strong>Closed Environment:</strong> A closed environment is one that is stable and predictable – often created artificially. There are limited possibilities for action, and the performance of the skill has a clear beginning and end that is initiated by the performer.</td>
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<td><strong>Open Environment:</strong> An open environment is impermanent, and the performer has to continually change and adapt their movement.</td>
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<tr>
<td><strong>Timing &amp; Pacing (internal/external)</strong></td>
<td><strong>Internal/ Self Pacing:</strong> The skill has a clear beginning and end which is initiated by the performer.</td>
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<td><strong>External/Environmental Pacing:</strong> The circumstances through which the skill is required are controlled by the environment where it is practiced. The initiation of the skill may not have a clear beginning and depends on perceptual ability and sensory monitoring of events around the performer.</td>
</tr>
<tr>
<td><strong>Articulation of Skill (discrete/serial/continuous)</strong></td>
<td><strong>Discrete:</strong> Skills with a definite beginning and end.</td>
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<td><strong>Serial:</strong> A series of discrete skills that are strung together (either sequentially or synchronously) to create a more complex movement.</td>
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<td><strong>Continuous:</strong> These involve the coordination of many sub–levels of serial skills at once. They might have no obvious beginning or end, and performance may include multiple and overlapping cycles of serial skills.</td>
</tr>
<tr>
<td><strong>Training/Practice (Fixed/Variable)</strong></td>
<td><strong>Fixed:</strong> Specific movements (sometimes serial/continuous skills) are practiced and perfected through repetition.</td>
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<td><strong>Variable:</strong> Modulations of the skill are practiced in a variety of contexts and situations where the technique is used. This usually occurs in an open environment, where cycles of continuous skills must be creatively adapted to circumstances at hand.</td>
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but there are other aspects of kayaking where these can also come into use in terms of general fitness and the ability to perform in conditions that are exhausting and uncomfortable. Many of the rope tricks have clear parallels in the types of movements in kayak rolling – but none are exactly the same. To understand the relationship between *allumaariaqattaarneq* and *kinngusaqattaarneq*, it is useful to import terminology for sensorimotor skills developed in the fields of kinesiology and cognitive psychology. The categories of sensorimotor descriptions outlined in Table 6 are not strict definitions, and overlap to some degree, but they allow for characterization and comparison of sensorimotor skills and the environments where they are practiced and used.

The ropes essentially create a closed environment, permitting a limited but predictable field of movement. The ropes are not a stable surface. The system has low stability and slight movements of the kayaker can tip their body along the rolling axis. The *allumaariaqattaarneq* are generally serial skills, and while they have a clear beginning and end, which is initiated by the kayaker, the movements include many discrete phases of action that are difficult to separate out and describe sequentially. Most of the exercises are self/internally paced, at least in terms of the set-up and initiation of the manoeuvre. Once in motion, the kayaker's balance loses stability and pacing of the manoeuvre becomes more external; the kayaker must adjust their performance to manipulate and control their rotational inertia. For example, in the *qafaasaarneq* manoeuvres, once the kayaker commits to the roll, they have to keep their momentum in order to return to an upright position. In the case of the repetitive version (where the kayaker rolls five times each way), they must keep track of their actions and slow their rotation in order to stop at an upright position on the final roll.

The *allumaariaqattaarneq* require the coupling of sensory perception and motor response. Kayakers must interpret sensory cues to track their position, understand their current orientation, predict their trajectory, and adjust their performance with compensatory action in relation to the goal of the manoeuvre. For example, in the *qupaloraarsusuaarneq* exercise, as the kayaker's weight is shifted around the axis of rotation, the forces they must exert through their muscles are variable and change as they pivot around the axis of rotation. They must recognize when their inertia is slowing, and what action must be taken to complete it without pushing themself over the other side.
Coordination – the ability to string together discrete muscle movements towards achieving a particular objective – is a critical aspect of the *allunaariaqattaarneg*. As illustrated in the example exercises above, almost every major muscle group is being used in coordination at once. Each exercise involves a combination of gross and fine muscle movements – the timing and force of these is often variable during the performance of the exercises from its initiation to its completion. For example, in *tunnussineq*, the kayaker is using almost every muscle in their body but not at the same time, and not in the same way over the course of the manoeuvre. In discussing the *allunaariaqattaarneg*, it is very difficult for kayakers to describe exactly what it is they do when they complete an exercise. Typical responses are statements like "you push first with the calf muscle and pull on the right hand" or "you just push up with your knee while twisting your hips to the right" – invariably no two kayakers describe the same exercise in exactly the same way.

The ability to do a particular manoeuvre is a matter of practice and is achieved by working on the exercise, and breaking it into smaller movements and phases. An individual cannot pause to think about what each limb and muscle is doing during the performance of an exercise; their capacity for perception and action is dependent on motor memory. The coordination of muscle movements, the rhythms of their combined and differential movement must be practiced until they are fluid. Most kayakers find that they have a preferred side to complete a manoeuvre, which is usually (but not strictly) associated with their handedness. Practicing *allunaariaqattaarneg* by reversing the position of the hands, or the direction of the roll, helps kayakers to overcome handedness and develop a more symmetrical coordination of muscle movement and control.

The rope exercises are also highly effective for developing muscle strength and endurance. On their own, the rope exercises have varying degrees of difficulty – some are easier than others, and can be done on the first couple of attempts, others can take years of practice to develop. Some individuals find certain exercises harder than others, which is likely due to differences in body shape among other factors. When the *allunaariaqattaarneg* are strung together and performed in succession, they are extremely tiring and exhaust the kayaker very quickly. For beginners, who are just starting kayaking and trying to develop their fitness, they become shaky after performing a few rope manoeuvres. These novices hit a point where they feel clumsy, their muscles feel as though they don’t work, and they find it difficult to control
their movements. Kayakers who are early in their training also become very sore after practicing the *allunaariaqattaarneq*, but through practice, this diminishes as the kayaker's fitness develops.

The ropes, like kayaking, are performed individually, yet they are also co-actively social in that they are competitive and usually practiced as a group activity. In the clubhouses, one person will perform a manoeuvre or succession of manoeuvres followed by another who will try to match their performance or do better. This co-active participation sets the standards for performance and is a mechanism for feedback – the *allunaariaqattaarneq* help kayakers to assess their fitness in relation to others. The competitive aspect also helps kayakers to develop a sense of flow and emotional investment in training.

### 6.2.1 Position in Broader Kayaking Enskilment

In terms of broader enskilment, kayakers usually start practicing *allunaariaqattaarneq* very early in their process of learning. The rope exercises can be undertaken before a kayaker even has their first kayak, and they are usually practiced intensively leading up to the first attempts to roll a kayak. Mastering certain rope exercises does not necessarily enable the kayakers to roll the kayak, but it does give them many advantages in terms of requisite sensorimotor ability and fitness. The rope exercises are a good point of comparison for individual fitness and can act as an index of a kayaker's preparedness to attempt rolls. *Qafaasaarneq* is felt to be particularly important, but there is no strict definition as to which *allunaariaqattaarneq* they should master before starting to roll.

Kayakers do not stop practicing the *allunaariaqattaarneq* once they move on to rolling; the ropes also play an important role in the development and improvement of fitness throughout the course of a kayaker's enskilment. As will be discussed in the next section, there are many different types of kayak rolls that are important to learn. These are progressively more difficult, and the hardest ones can take years of careful training. When a kayaker is struggling to master a particular roll, they can break the manoeuvre into discrete movements and use similar aspects of different *allunaariaqattaarneq* to develop their technique. The ropes help learners to pinpoint particular difficulties that they are having and to practice them in isolation. For skilled kayakers, the *allunaariaqattaarneq* also help them to judge their physical condition. Maligiaq Johnsen Padilla, for example, is widely known as one of the best kayakers in Greenland. When we were
filming examples of alluqorsaaqtaarneq in Sisimiut in 2011, there were several exercises that he found very difficult to do, even though I had seen him perform them with ease two years prior during the Ilulissat competition in 2009. Between 2009-2011, he had been away from Greenland, and through the alluqorsaaqtaarneq, he could sense that his physical condition had changed.

6.3 Kinngusaqattaarneq (Kayak Rolling)

There is no set age, or even a particular stage of learning when a learner is able to start attempting to roll a kayak. It depends primarily on their interest and commitment to learn, and the availability of someone to teach them, who can also use their experience to judge whether or not they are ready. I have seen kayakers as young as 13 learning to roll, and conversely there are some older kayakers who have never been able to develop the skill, and instead make do by paddling in still conditions with others on hand to help if they get into trouble – which limits their independence as a kayaker. A beginner also needs access to equipment to be able to learn; this generally includes having a kayak that is tailored and personalized to fit them, along with a tutlik and a paatit. There are many different types of kinngusaqattaarneq that have varying degrees of difficulty. For the competition, Qaumma Katuqtaas has selected 35 different examples from around Greenland, which cover most of the basic situations where a kayak can be capsized. In the competition, the competitor has 30 minutes to complete as many as possible, rolling on both sides. In the descriptions below, I have grouped the different types of kinngusaqattaarneq into 11 general categories that are based largely on the types of situations they are designed to simulate, and they loosely follow the examples selected for the competition.

Learning to roll a kayak in Greenland has several complications that recreational sea-kayakers elsewhere in the world don't have to consider. In general, Greenlanders have to practice in cold seawater, which can, in places like Ilulissat, be very close to freezing\(^\text{28}\). Learners usually have a small window of opportunity to practice before they get too cold. In Sisimiut, there are a couple of nearby freshwater lakes that are occasionally used for practice during the summer months, but, in general, practicing happens in shallow seawater close to the shore. Additionally,

\(^{28}\) When the Qaumma Katuqtaas annual competition was held in Ilulissat in 2009 there was a lot of ice in the water for the rolling after a nearby glacial calving event. Most kayakers were not able to last the full 30 minutes, and several competitors exhibited clear signs of moderate to severe hypothermia.
learning generally has to take place without someone standing in the water to assist the kayaker. For the most part, training occurs with a trainer or two in their own kayaks, ready to rescue the beginner if necessary. Many Greenlanders do not have much experience swimming, so confidence and comfort with the idea of being submerged in the water is an important factor before starting to learn. Sometimes, kayakers practice putting their head underwater and holding their breath in preparation (Figure 73).

![Image](image1.jpg)

![Image](image2.jpg)

Figure 73 Developing confidence with being submerged. 1) A kayaker dips his face in the water before practicing rolling. 2) Clearing seawater from the sinuses after rolling.

6.3.1 Aalatsilluni: sculling and preparing for the first attempts at rolling

In preparing to learn rolling, the kayaker has to 'get the feel' for their kayak, and develop a sense of the types of forces that can be exerted on the kayak through their core muscles, knees, and feet. It is important that they have a sense of balance, so a kayaker usually has a fair bit of experience paddling their kayak before they start trying to roll it. As seen in the cross sections of the hull in Figure 27 (Chapter 5), most kayaks have hull shapes with different zones of stability, tailored to the kayaker's preferences and the siannii (side stringers) can act as a kujaaq (keel) when the kayak is pitched to one side. Before learning to roll, it is important to have a strong sense of the angles at which the hull has the most stability. To get a sense of these, one technique is to use the tip of a trainer's kayak, or the edge of a dock as a stable surface. Holding onto the stable surface, the learner will then gradually lower themselves towards the water. While holding
onto the stable surface, they can practice having their face submerged, and can feel the 'point of no return' where they have leaned so far over that the kayak will capsize. This assisted lowering by using a stable surface also lets them practice using their core muscles, hips, knees and feet to right themselves – and the kayaker can practice righting themselves by using as little pushing force on the stable surface as possible.

Learners also have to get a feel for the resistance drag of the water against the paatit. In the simplest rolls – the ones a beginner starts learning – the paatit is an important part of the motion, as it provides resistance in the water and something to push against. To get the feel for this, learners practice a sculling paddle motion called 'aalatsilluni' – a motion often likened to spreading jam on toast – and they move the paatit through the water, feeling the variability of drag that it produces at different angles. Through aalatsilluni, the kayaker can feel that there is some resistance in pushing away and in pulling towards themselves, which they can use in combination with their core muscles, thighs, and feet to change the pitch of the kayak.

![Figure 74 Practicing aalatsilluni with the paatit.](image)

It is very unlikely that a kayaker's first attempt to roll will be successful, and as they practice moving the kayak through aalatsilluni holding the kayak steady at different angles, there is an increasing likelihood that the kayak will capsize while they are practicing. So it is important that the kayaker is prepared to be submerged, and familiar enough with rescue techniques so that they can work with their teacher to right themselves. The standard rescue technique is to use the tip (usuusaq) of another person's kayak as stable point to push down on (Figure 75). The rescuer will be positioned and ready to intervene if the student is submerged and unable to complete the roll. If a learner capsizes, and they cannot right themselves, they have
to remain calm and tap on the bottom of their kayak to indicate that they need help. Their teacher or rescuer will immediately bring their kayak perpendicular to the capsized kayaker and will push the tip of their kayak against the hull of the capsized one. The capsized learner can then use the *usuusaq* of the rescuer to push themselves up again. To practice being rescued, the kayaker has to deliberately capsize. While practicing the rescue technique, learners can develop confidence in the water by staying underwater a few seconds or letting their arms hang down in the water before pulling up and using the tip of a teacher's kayak to right themselves.

![Figure 75 Rescue technique during a capsize scenario where the kayaker cannot roll. A capsized kayaker taps on the bottom of their hull to indicate they need help and then use the *usuusaq* to raise themselves.](image)

When the kayaker is confident that they will not panic if the kayak capsizes, they can practice tipping the kayak over to the point that *aalatsilluni* is the only thing keeping the kayak upright. This can be done in two positions. *Innaqatsineq aalatsilluni* is sculling from the side with the kayaker leaning back, and extending the *paatit* from the chin out from the kayak, while facing up. This is the easier version, and the kayaker initiates the manoeuvre by sculling in an upright position, and slowly leaning over so that the kayak rolls past the tipping point, where it would normally capsize if it weren't for the resistance produced through sculling. The learner practices raising or lowering themselves by increasing or decreasing the resistance against the *paatit*. If the kayak is tipping too quickly, they can create more resistance through the *paatit* and also bring the kayak up by pushing up with their knee and twisting their hips. Eventually the
Figure 76 Performing *innaqatsineq aalatsilluni*, by keeping the kayak from tipping over through a sculling motion while leaning back. The numbers indicate the sequence of the images.

A kayaker is able to allow their whole body to rest in the water while sculling, and they learn how to initiate the return, not through forcing the *paatit*, but by starting the manoeuvre through the hips and knees. The second position they can try is *pallussineq aalatsiluni* (sculling with the face down). In this manoeuvre, the kayaker is bent more at the waist, instead of leaning back. They lower their face into the water, holding it there for a few strokes before returning to an upright position.

As with all of the *kimngusaqattaarneq* that will be discussed, it is important to be able to perform the manoeuvres on both sides of the kayak easily and naturally. Most kayakers find that they have a side of preference — usually related to their handedness — that is more natural and easier to perform a roll. But from the start there is an emphasis in training on overcoming this natural tendency, and *aalatsilluni* is practiced until it is performed easily on both sides.
Figure 77 Performing *pallussineq aalatsiluni* by keeping the kayak from capsizing by sculling while facing downwards.

6.3.2 *Kinnguffik Paarlallugu* – Learning the first roll

When the kayaker has developed some comfort with controlling the kayak through *aalatsilluni*, it is a good indication that they are ready to attempt rolling. The most basic roll that is usually the first that a kayaker learns is called 'kinnguffik paarlallugu' or 'kinnguffik nerfallaallugu' – which has also become known in the global sea-kayaking community as the
'Greenland roll'. In this roll, depicted in Figure 78, the kayaker set the *paatit* up along the side of the kayak before committing themselves to tipping over. If they hold the *paatit* in position, it will be set up in the perfect place to start the roll once they have completely capsized. To return to an upright position, the kayaker brings the *paatit* around in a sweeping motion, rotating their body so that it is leaning backwards in the kayak (in the same position as with the *innaqatsineq* sculling manoeuvre), and while still leaning back, their body raises out the water and onto the aft deck of the kayak as it completes the rotation. If the kayaker has developed some ability with the *innaqatsineq* sculling, they should be able to raise themselves from this position, even if it takes a few attempts.

Based on my observations of roll training, and from informal interviews with kayakers about teaching, the first attempts at rolling almost always result in an episode involving some desperate flailing and rescue. Especially at this first stage, there are a lot of natural tendencies in reaction to overcome, including a difficulty orienting what action will produce a counter effect. The success of the movement is primarily controlled through the hips, core muscles, and movement of the entire body – the sweeping motion of the *paatit* helps, but inevitably, the problem that most learners have when learning the first rolls is that they try too hard to force themselves up through the *paatit*, using their arm muscles rather than their body. Teaching a kayaker to roll for the first time provides a clear example of how enskilment develops through the co-construction of knowledge. A teacher can direct the learner's attention to specific aspects of their practice, but no amount of verbal explanation or demonstration can completely transfer the ability to roll to a beginner. They must develop the skill through their own agency, realizing weaknesses in their technique and learning to coordinate serial muscle movements with different cycles of pacing (Figure 79). When a learner manages to roll for the first time, they are encouraged to immediately try again. As they continue to roll, they begin to commit the movement to motor memory, and can practice making the manoeuvre more fluid. As well, it is important for them to immediately start trying to roll on the opposite side, and to not get too far with committing the roll to memory before they are able to develop some symmetry in the technique. In terms of a kayaker's broader enskilment, developing the ability to complete a simple roll such as *kinnguffik paarlallugu* is an important step that opens up many new
Figure 78 Performing the basic roll – *kinnguffik paarillugu*. By sweeping the *paatit* and body around, he exits the water leaning back in a similar position to *innaqatsineq aalatsilluni* (5-8).

possibilities for participation and learning. Once they are certain that they can use the technique in an emergency, learners attain a greater degree of independence and can more confidently depart the confines of the harbour and go out into the open ocean. However, the ability to roll in the safety of a harbour with the *paatit* at the ready, or with experienced kayakers on hand to rescue, is only the beginning.

6.3.3 Other Simple Rolls

*Kinnguffik paarillugu* is the easiest roll to learn, and it is a natural starting point that incorporates skills learned through *aalatsilluni*. However, there are also potential disadvantages to the roll that might make it less than ideal or even impossible to perform in certain
Figure 79 Co-construction of skill in learning *kinngusaqattarneq*, illustrated through an experienced kayaker teaching a learner how to perform *siukktu pallortillugu*. In frames 1-2, the learner attempts the roll unsuccessfully. In frames 3-5 Teacher demonstrates the roll, specifically emphasizing how the roll is initiated from the hips and core muscles. 6 – The broader community of kayakers can draw attention to aspects of practice, but the skill must be developed through the learner’s experience. The question mark represents an undetermined point in their future practice when they are ready to move on to learning more maneuvers.
circumstances. The scenario that *kinnguffik paarlallugu* simulates – where the kayaker sets up their rolling position and initiates the manoeuvre – is not likely to occur when hunting, or out on a recreational paddling trip. It is a self-paced skill that occurs in a closed system, in that the kayaker determines the timing and nature of the event. Many of the conditions through which a kayak could be overturned may happen in inelement weather, when the sea is choppy and where there is no clear or stable horizon, and there is a strong likelihood that whatever conditions contributed to capsizing the kayak may still be at work once the kayak is righted. In *kinnguffik paarlallugu*, one of the aspects that makes it easy to learn is that the kayaker’s weight is distributed towards the back of the kayak as they roll, and then the kayaker sits up (Figure 78). This means that as the kayaker come out of the water they are not facing forward or able to perceive what is happening around them until they sit fully upright.

There are two simple rolls that the kayaker can perform that bring them upright facing forward with the *paaitit* ready. The first is *kingumut naatilugu* (Figure 80), where the kayaker starts leaning backwards, finishing leaning forward, and *siukkt pallortillugu* (Figure 81), where the kayaker remains facing forward through the entire roll. Although it is harder to roll with the body leaning forward, there is some advantage to being able to do so. *Siukkt pallortillugu* is emphasized in particular because when it is done well, it is fast, crisp, and the kayaker remains facing forward, able to see what is happening at all stages in the roll.

![Figure 80 Kingumut naatilugu which is the opposite of kinnguffik paarlallugu. Here the kayaker starts the roll leaning backwards, and finishes leaning forwards.](image)

6.3.4 Assakaaneq – Successive rolling

To build confidence with simple rolls, a beginner can practice them many times over to help better coordinate serial muscle movements, and *assakaaneq* consists of stringing rolls
Figure 81 Siukkut pallortillugu. 1) Finishing the roll facing forwards with the paattit ready. 2-5) Siukkut pallortillugu.

together in succession. Assakaaneq can be made competitive by seeing how many successive rolls can be completed in a certain amount of time. Other games that help to perfect the kayaker’s symmetry of movement, is to try and roll the kayak successively and keep it in a straight line, or attempting to angle each roll so that the kayak eventually comes around in a full circle. Successive versions of both kinngufik paarlallugu and siukkut pallortillugu are some of the rolls practiced in the competition. While these help learners to develop their coordination, assakaaneq also have a functional value. In the event of a capsise in a more open environment, it can be the case that the conditions that knock the kayak over will do so again, so the kayaker must be able to roll successively.

6.3.5 Rolling with the paattit in an awkward position

In the unexpected scenarios through which a kayaker can be capsized, it will not necessarily be the case that they will have the paattit at the ready. In the confusion, it is very easy
Figure 82 Examples of rolls with the *paatit* in an awkward position. 1-3) *Pakassumnilugu* (paddle in the crook of arm). 4-7) *Aarlammillugu* (with the paddle along the spine).

to grab the *paatit* the wrong way, or not be sure about its orientation. There may be no time to set up the *paatit*, and the kayaker may have to roll in whatever awkward position they are clutching it. Figure 82 – 22 detail seven examples of types of *kinngusaqattaarneq* that are performed with the *paatit* in an awkward position. There is a progression in difficulty – examples where the kayaker is leaning forward are generally more difficult, and their counterparts where kayaker leans backwards are seen as a starting point for learning them.

These rolls include *pakassumnilugu* and *paatip kallua tuermillugu illuinnarmik* — where the kayaker anchors one end of the *paatit* in the crook of their arm, or in their arm pit. This simulates the scenario where a kayaker is capsized while holding an important object in their
Figure 83 Examples of rolls with the paatit in an awkward position. 1-3) Kingup apummaatigut (with the paddle behind the back). 4-7) Kinguk tunusumillugu (paddle behind the head, starting the roll leaning backward, finishing forward. 9-11) Sivuk tunusumillugu (paddle behind the head, starting and finishing forward).

hand and can only grasp the paatit with one hand. Another possible scenario is where the kayaker isn’t necessarily holding the paatit properly before being capsized, and in the process of reaching for it has grasped it in an awkward position. One example is to roll with arms crossed
Figure 84 Examples of rolls with the *paatit* in an awkward position. 1-4) *Paatip Kallua Tuermillugu Illuinnarmik* (with the *paatit* anchored in the armpit). 5-8) Taallit Paarlatsillugi (with the arms crossed).
rather than set up normally – this roll is called 'tallit paarlatsillugit paateqarhuni masikkut'. Another example is kingup apunmaatigut with the paatit held behind the back.

Other awkward, but perhaps unlikely situations are also practiced – these are difficult to link to specific scenarios where the kayak is capsized, but practicing them does increase the kayaker's dexterity and ability to roll in any circumstance. These include ariammmillugu, with the paatit held along the spine, and siukkut tunusummillugu and kingukkut tunusummillugu, both of which are initiated with the paatit behind their head.

6.3.6 Rolling with the paatit in a restricted position

In many of the manoeuvres, ranging from simple to those employing the paatit in an awkward position, the roll depends on the resistance made by the sweeping motion of the paatit. However, there are many scenarios where a capsized kayaker's movement is restricted, and it may not be possible to sweep the paatit. Restrictions to movement could occur if the paatit is tangled in the harpoon line, if the kayaker is towing a seal and there are lots of lines in the water, or if there is a lot of equipment on deck. In situations like these, the kayaker must be able to roll by using the aalatsillumi or sculling motion.

These rolls are in general much more difficult, and their execution is elongated in time; because each 'scull' does not provide enough resistance for the kayaker to completely roll the kayak on its own, the rolls are a sequential progression, with each scull moving the kayak slightly further around the axis. Rolls that depend on aalatsillumi entail exhausting physical work and usually proves quite tiring for the arms. The examples where the paatit is held in an awkward position are particularly complex, and can depend on the coordination of very subtle muscle movements of the kayaker. As depicted in Figure 85, these rolls can result in the kayaker being underwater, unable to breathe for a long period of time, and they require patience and control and the fortitude to resist switching to an easier roll. The easiest example is masikkut aalatsineq – with the paatit across the front of kayaker. The most difficult examples are isserfikkut aalatsineq (depicted at the beginning of Chapter 4, Figure 16) with the paatit held behind the back, and qaanmap ataatigut ipilaarlugu with the kayak beneath the kayak.
Figure 85 Examples of rolling with the paddle in a restricted position. 1-6) *Masikkut aalatsineq* (rolling by sculling). 7-10) Sculling the *paatit* under the kayak – also one of the first rolls described by Crantz (1820:141) in the mid 1700s.
6.3.7 Rolling with Equipment

When learning and practicing different *kinngusaqattaarneq*, the kayak is stripped of any equipment. However, as seen in figure Figure 12 in Chapter 3, kayaks generally have a lot of equipment on their deck when they are being used for hunting. Aside from impacting the normal movement of the kayaker, and making it awkward to sweep the *paatit* fully around, the equipment can also create a lot of resistance and hinder the normal movement of the kayak. So the *kinngusaqattaarneq* can be practiced with equipment on the deck. Indeed, for one of the rolls included in the competition – *avataq isserfiup taggaanut* – the kayaker has to roll with the *avataq* (hunting float) attached to their kayak (Figure 86).

![Figure 86 Rolling with the avataq attached to the deck.](image-url)
6.3.8 Rolling without the Paatit – Norsaq Rolls

Kayakers also have to be able to roll without the paatit as there are many scenarios through which they can be separated from it during a capsizing event. One option in such a scenario is to roll using the norsaq (the throwing board for casting the harpoon) which is usually attached to equipment on the deck. Indeed, one of the most likely scenarios through which a kayaker can be capsized is when they are leaning back to throw the harpoon and already have the norsaq in their hand. There are a number of kinnuusaqattaarneq that the kayaker can practice rolling with the norsaq from different positions. The easiest is norsamik nerfallallugu, where the kayaker exits the water leaning aft. The hardest are norsamik kingukkut (starting with the body leaning aft, and exiting the water leaning forward), and norsamik masikkut where the kayaker remains tucked forward throughout the roll (Figure 87).

6.3.9 Rolling without the Norsaq – Assammik (Hand Rolls)

From the norsaq rolls, the next natural progression in a kayaker’s enslilment is assammik, or the ability to roll in a number of scenarios using only the hands. The assammik are of obvious utility for a kayaker, because it is possible to become separated from both the paatit and norsaq in a capsizing event. There are a variety of different hand rolls. The basic assammik include basic masikkut, kingukkut, and nerallallugu variants – where the kayaker finishes the roll laying back, or tucked forward (Figure 87). Each of these can be further complicated by rolling with something in one or both of the hands to simulate the scenario where the kayaker is holding something important. The assam pegillugu variants (with one fist clenched) complicate the rolls further by limiting the amount of drag kayakers can push against with their hands. In the competition, to prove that the kayakers have kept their fists clenched throughout the roll, they usually have to hold onto a small object such as a table tennis ball (Figure 88). The assammik
Figure 87 Examples of rolling with the norsaq. 1) *Norsamik nerfallaallugu*, leaning backwards. 2-4) *Norsamik kingukkut*. 5-7) *Norsamik masikkut*.

Can be made even more complicated by completing the roll while holding a heavy object in one hand – a manoeuvre called *ujaaqamik tigumesserkuni*. In the competition, the standard weight used for the roll is an 8kg brick (Figure 88).
Figure 88 Examples of assammik (hand rolls) 1-6) Assammik massikkut. 7) Assammik kingukkut 8) Ujaqqamik tigumesserluni (holding a brick while rolling).

6.3.10 Rolling while pinned or tangled

One of the most dangerous capsizing scenarios is when a kayaker is separated from their paattit/norsaq and their body is pinned or tangled, restricting movement to the point that one or both of the arms can't be used to roll. This is an unlikely possibility, but something that could potentially happen while hunting, when there are a number of different lines in use, either for the harpoon or for towing gear. Another remote possibility is that the kayak could capsize while adjusting or changing the tuitik, and the kayaker is not even able to move their arms.
Figure 89 Kunuunnguaq Davidsen performs *ikusaannarmik niaqoq at the National Competition* – using only his elbow to roll.

*Ikusaannarmik niaqoq* is where the kayaker rolls using only their elbow, by tucking one arm around their stomach and placing the other hand behind their head (Figure 89). *Tallit paarlatsillugit timaannarmik* (sometimes referred to as the 'straight jacket roll') is generally

Figure 90 Attempt at performing *tallit paarlatsillugit timaannarmik*, one of the hardest maneuvers.
acknowledged to be the most difficult of the *kimgusaqattaarneq*, in this manoeuvre, the kayaker rolls with both their arms crossed on their chest, using only their body for resistance. Only a few kayakers in Greenland are able to do this manoeuvre (Figure 90).

6.3.11 Nusutsinneq – controlling the kayak while being dragged

*Nusutsinneq* simulates the situation where a harpooned animal drags the kayak. This is one of the most dangerous but likely scenarios that can take place when kayak hunting, either as a result of the harpoon line becoming accidentally tangled around the kayak, or as described by Fabricius and Nansen in Chapter 3, as an intentional display of skill and hunting prowess. To simulate this scenario, a line is attached to the *taqqat* (deck straps) which then goes under and around the kayak, and stretches out to the shore. The other end of the line is held by a group of people (usually 4-5) who pull the line as hard as they can. The kayaker must prevent themself from being dragged uncontrolled, or from being snapped around and dragged while capsized. Although not necessarily a rolling manoeuvre (if the kayaker can keep themselves from capsizing), the skill requires many elements of ability that are a part of different *kimgusaqattaarneq*. As the kayak is pulled, there are variable pressures acting on the kayak in different ways – moment for movement, the kayaker must sense how the kayak is moving and intuitively adjust their action to control the situation using the *paatit* and their body. To illustrate this event, it is useful to compare separate attempts at the manoeuvre performed by two brothers – Jaffet and Kunuunnguaq Davidsen – at the Qaannat Kattuffiat competition in Sisimiut in 2011. In the rolling competition, *Nusutsinneq* is the final manoeuvre, and only the best kayakers attempt it, so it is usually very exciting for the crowd. On this year, Jaffet and Kunuunnguaq had very close scores, and successfully completing *nusutsinneq* would have been enough for either of them to win the competition.

Jaffet's attempt didn't go so well. Even though he was set up, it was apparent from the moment that the men on the dock started pulling that he was having difficulty controlling the kayak (Figure 91). As depicted in the sequence, he capsized very quickly, and was dragged sideways with his head stuck under the water. Seeing that he has not been able to control the
Figure 91 Jaffet Davidsen's attempt at nusutsinneq during the 2011 Qaannat Kattuffiat competition in Sisimiut.

kayak, the men stop pulling on the rope. The whole incident lasted only a few seconds, but there was a long pause where Jaffet's capsized kayak sat motionless. He was snapped around very quickly and dragged for some distance, so it was not certain he was okay. To everyone's relief, he eventually rolled using a simple manoeuvre, and leaned forward on the deck visibly shaken and spluttering the seawater that he swallowed while being dragged. It took Jaffet a long time to
Figure 92 Kunuunnguaq Davidsen’s attempt at *nusutsinneq* during the 2011 *Qaannat Kattuffiat* competition in Sisimiut

recover and clear his sinuses. The competition is a simulation, and although it constitutes a more externally paced skill in an environment that is comparatively more open than the other self-paced rolls, it is still a closed environment in comparison to a real hunting situation. Jaffet was ready for the *nusutsinneq*; there wasn’t really a seal or a walrus attached to the harpoon line, and the men pulling him were ready to stop because they did not want to see him hurt. Jaffet is one of the best kayakers in Greenland, and watching him fail at this manoeuvre it is easy understand the
potential dangers involved in kayaking. In a real hunting scenario, where Jaffet might not have been expecting the situation, and the injured animal would likely have pulled the kayak from many directions; it could have been very dangerous.

In the context of the competition, Jaffet’s failure at musutsinneq offered Kunuumnguaq an opportunity to take the lead. In the sequence of pictures, it can be seen that Kunuumnguaq had a little more control—the force of the tangled line actually pulled him under, and at one point, only his head was sticking up through the water. Below the surface, he was bracing into the direction he was being dragged, steadying the kayak and preventing it from flipping over by sculling with the paatit and balancing the kayak with his core muscles, hips and knees (Figure 92). At no point was there a clear single course of action, and Kunuumnguaq adjusted his performance throughout the manoeuvre, sensing how the orientation of the kayak was drifting, interpreting each pull, and reacting intuitively. In a very literal sense, the knowledge he mobilized was strictly embodied knowledge, and his performance is the result of creative adjustment to the flow of an open and unpredictable environment. The men on the dock eventually ran out of room to keep pulling, and they had to give up, letting Kunuumnguaq’s kayak float back up to the surface. The crowd went wild because they knew he would probably be the only successful one that year, and they cheered and waved Greenlandic flags as Kunuumnguaq spun his paatit over his head in celebration.

6.4 Discussion of Kinngusaqattaarneq and the Process of Enskilmment

To develop the ability to intuitively respond and skilfully roll a kayak when unexpectedly capsized, the process of learning is embodied and situated, at first, through simulation. Both allunaariaqattaarneq and kinngusaqattaarneq partition the skill at different scales into subsets of ability so that they can be practiced and honed at first in isolation through fixed practice, and then as assembled serial and continuous skills through variable practice. Although most of the

29 This was the same event depicted at the opening of Chapter 4.
*kinngusaqattaarneq* can be linked to real scenarios through which the kayak can be capsized, they are ultimately all simulations that occur in an environment that is to some degree closed and internally paced because the kayaker controls the initiation of the manoeuvre (even in the case of *nusutsimneq*). Each of these simulations allows the learner to identify their weaknesses and practice coordinating complex serial movements until they are a part of both their perceptual ability and motor-memory.

Social relationships are very important to understanding how the skill is co-constructed between individuals. In the earliest stages of enskilment, learners are dependent on teachers to know when they are ready to start learning to roll, to draw attention to aspects of performance, and to rescue them if necessary. However, the skill cannot be transmitted between individuals – a point made repeatedly throughout this thesis is that it must be developed through the learner's action as depicted in Figure 79. As a learner develops confidence and ability with the simplest rolls, they also develop a degree of independence, and do not necessarily need a teacher on hand to practice and develop their skill. They can practice rolls that they have seen other kayakers perform, and if they are not able to do them, they can fall back on the simple rolls to right themselves. As they are struggling with each of the *kinngusaqattaarneq*, they can identify their weaknesses and develop their strength or ability to coordinate a particular movement by practicing the *allunaariaqattaarneq*. Competition is an important aspect in the development of skills at this level – it helps to situate co-construction by developing an experience of flow, where learners are emotionally invested in the success of their movements and can judge and adjust their performance in relation to others in the community.

In a very similar way to the *chaîne opératoire* of kayak construction, the *kinngusaqattaarneq* form a taskscape that has journey-like qualities (Figure 93). Each manoeuvre presents a new challenge and new opportunities for perception and action; at each stage, kayakers must hone their ability, identify their weaknesses, develop their fitness and practice coordinating their action until it is a fluid response. By progressing through different *kinngusaqattaarneq*, kayakers develop new capacities for awareness and response, and are able to make finer perceptive distinctions within their environment. Although the process of learning involves partitioning and simulation of particular scenarios, it is important to emphasize that the objective in learning is a state of readiness rather than internalization of procedural memory or best practice. Through training, kayakers are not simply mastering a certain suite of
Figure 93 The *kinngusaqattaarmeq* conceived of as a taskscape. By progressing through the different exercises, the kayaker develops capacities for awareness and response. In the situation of an unexpected capsize, the kayaker calls to practice the totality of their experiences developed in each simulation, reacting intuitively rather than selecting a particular procedure.
kinngusaqattaarneq, they are preparing for a moment in their practice as a kayaker when they are confronted with unexpected circumstances where their life can depend on creative responsiveness. Figure 93 attempts to depict this scenario that kayakers train for, where in the course of practicing kayaking in the open environment, the kayaker is unexpectedly capsized through circumstances beyond their control. In their reacting to such a scenario, the kayaker is not calling to practice a particular sequences of memorized actions or executing a particular kinngusaqattaarneq. In the image the kayaker's skilled response resembles a particular practice roll – siukkut pallortillugu – yet it is more accurately described simply as praxis, an intuitive reaction that draws on tacit knowledge developed through their sensorimotor development through each of the kinngusaqattaarneq as a whole.

The kayaking community does not have formal or informal rules that suggest a particular suite of kinngusaqattaarneq that a kayaker needs to master before taking part in recreational activity or hunting in an open environment where the ability to roll may be tested. That step seems to be a matter of personal confidence, and it is apparent that there is no endpoint to enskilment. There are many scenarios in the open environment that no kayaker can be fully prepared for, and even the most skilled kayakers can always improve their practice. Over the three year period that I conducted the ethnoarchaeological fieldwork, I was able to track the progress of individuals who were learning the kinngusaqattaarneq. While some individuals seem to possess more natural talent than others, it is apparent that developing the ability to perform the kinngusaqattaarneq outlined in this chapter is a process that takes most kayakers many years of careful training. Individuals in their late twenties to late thirties seemed to be in peak performance, having had around ten years experience to build up to that level, and there are some exceptional kayakers who have maintained a high degree of ability with kinngusaqattaarneq well into their sixties – indeed, the late Manasse Mathaeussen was able to perform many of the most difficult manoeuvres into his seventies. Kayakers who start learning in their teens are more likely to develop a high degree of skill, whereas latecomers who start learning as adults find it more difficult. Kayakers can lose the ability to perform the most complex manoeuvres if they don't continue their practice and maintain their physical condition.

For the most part, kinngusaqattaarneq is a skill that is invisible archaeologically. From hunting scenes depicted in Thule art, it is difficult to imagine that early Inuit kayakers would not
have been able to perform the skills noted in this chapter – indeed, it feels intuitive that they would have even had a much higher degree of skill through years of hunting experience in the open environment. It might also be noted that the activity-induced musculoskeletal stress markers identified in Thule skeletal materials by Hawkey & Merbs (1995) could be accounted for by the high level of fitness training involved in developing the ability to roll rather than the actual practice of kayaking. However, in reflecting on the ethnoarchaeological observation of learning *kinngusaqattaarnerq* in the modern kayaking community, there are several important points, which will be re-emphasized in Chapter 8, which assesses the analogical value for interpreting the archaeological record. Greenland kayaks are well designed for rolling – as seen in Chapter 5, the ability to roll is one of the main reasons that kayaks are highly personalized and measured to perfectly fit individual body specifications. They are designed so that the deck can be sealed to a *tupilik* through the *paaq*. Yet, no matter how well designed and equipped, kayaks are completely useless without skilled operators, and in creating a narrative of the deeper history of Inuit culture, it is important to understand kayaking as something more than a 'cultural trait' with an origin that was simply transmitted between different regions through time.
Chapter 7
Inuit Kayakers as a Community of Practice through Time

So it's a good hunting area my uncle is born in, because it is near four glaciers and there's a lot of ice, and the ice is cracking all the time. So, they don't always hear you, when you are near the seal. So you can get really close to them. But out in the bay here, there isn't as much ice, the seal senses everything, and he knows you are there. So it's up to the seal if it wants to become a dead one or not...

I can feel it, how they had it, my old family – my grandmother and grandfather, the old ones – because I'm still going to the places they were born and died. I feel a part of it.

John Pedersen (2010)

At the beginning of this dissertation, I introduced the premise that kayaking contains forms of cultural knowledge that can only be reconstructed in the personal experiences of each generation. In the ethnoarchaeological discussion so far, this point has been a recurrent theme underlying the development of *Qaannat Katuffiaq*, and the examples of practices the modern kayaking community emphasizes as meaningful. For the community, the physical process of becoming a skilled kayaker is an important link to a heritage of intergenerational experience in an environment that perpetually changes. The objective in ensuring the persistence of kayaking is not to recreate the totality of traditional life. Rather, the goal is to provide a framework through which individuals develop an intuitive sense of the world around them, transposing an ancestral heritage of creative environmental responsiveness to the context of Inuit modernity. The preceding chapters have provided examples of processes through which knowledge is co-constructed between the skilled community and the individual creativity of beginners through environmentally situated learning.

In the context of my research question, the temporality of this intergenerational exchange is an important part of understanding the relationship of the modern community to Inuit kayakers in the past. In this chapter, I tie together key ethnoarchaeological observations and reflect on the practice based model of culture proposed in Chapter 2 to conceptualize the constitution of the
community through the physicality of enskilment in the environment and the dynamics of intergenerational praxis through time. A 'community of practice' – a term coined by Lave & Wenger (1991) – can be conceived of as individuals who share unique capacities for awareness and response, developed through participation in a particular skill. Recalling Polanyi's (1966) knowledge continuum, communities of practice are based on the production of tacit knowledge, which cannot be de-contextualized from an individual's personal experience and engagement in the environment. A community of practice is actively engaged in the construction of experience between generations of knowledge through environmentally situated learning. I begin the chapter by mapping out the broader process of enskilment in kayaking, of which construction and rolling are just a part. I revisit the heuristic concept of 'taskscape' to understand the process through which a framework for environmental experience is emergent through intergenerational practice in the community (Ingold 2011). The extension of the community of practice into the deeper history of Inuit culture is explored by considering the overlapping composition of generations of knowledge. I conclude the discussion by examining how modern kayakers themselves perceive the relationship between their practice and that of their ancestors, as well as types of knowledge they produce about Inuit communities in the distant past.

7.1 Broader Enskilment in the Open Environment

It takes many years to learn how a seal behaves and you have to have a teacher, or an old hunter to teach you that and you have to use his experience...
I remember the first time I was out in a kayak hunting seals. There was a lot of seals near a big glacier and a lot of seals were popping up around me, and I couldn't decided which seal to hunt. I couldn't see where the different seals were going because there were so many. So I kayaked all day, and everything my uncle told me I forgot. I was just paddling around and the closest I got to the seals was about 30 meters maybe. And you have to get within 25 metres before you shoot. 15 meters is better, 10 the best.
It is a difficult thing to hunt because they are very sensitive seals. Even if you don't think you make any noise on the water, they can hear you, and they can feel you. Even if you can hear your kayak doesn't make a sound as you paddle, they can always sense you.

John Pedersen (2010)

A primary objective of my fieldwork was to map out the physical process through which individuals become skilled kayak hunters, yet much of a kayak hunter's enskilment takes place beyond the workshop and safety of the harbour. To draw on the terminology of the sensorimotor continuums from Chapter 6, the greater part of a kayaker's enskilment takes place in the 'open environment' where the pacing of situations through which a kayaker must coordinate their action to perceive and respond skillfully is beyond their control. Enskilment in the open environment is developed through an individual's personal experience coupling perception and action in response to the flow of situations at hand. Chapters 5 & 6 treated kayak construction and *kimgusaqattaarneq* (the ability to roll) in a high level of detail to form the primary point of reference for understanding the relationship between the physicality of the skill and the constitution of the community. I specifically chose them as examples to explore in detail, partly because they are emphasized by the community as meaningful in their exploration of heritage, but also because it was possible for me to participate in these as an ethnoarchaeologist (for the most part from the shore). It is important to assess the position of these examples in the broader enskilment of kayak hunting, and the extent to which the learning of these is representative of the process as a whole.

It is evident from experienced kayakers' accounts of hunting that there are many other sub-sets of skill that a beginner has to develop through their personal experience in the open environment, as exemplified in the above quotation from John Pedersen. On any particular trip, a kayak hunter is dependent on skilled practice to navigate a complex environment, sense and react to subtle changes in the weather, maintain vigilance while exerted, endure cold and uncomfortable conditions, intercept and interpret the behaviour of sea mammals, silently coordinate action with other hunters, successfully deploy the harpoon and other equipment, etc. Figure 94 maps out four categories of developed ability, derived from interviews with kayakers about their personal experiences, which are depended on as a normal part of kayaking. These sub-sets of skill are not strict delineations, and at any moment of practice, a kayaker might
Social Skills
- Team participation
- Interpret consequences of action in relation to others
- Familiarity with rescue techniques

Environmental Knowledge
- Navigation
- Weather
- Local ecology
- Animal behaviour and routes of movement

Technical Ability
- Advanced paddling skills (e.g. rolling)
- Stalking techniques
- Instinctive deployment of weapons and associated equipment

Fitness/Coordination
- Arm strength
- Core strength
- Posture
- Flexibility
- Hardiness in cold/uncomfortable conditions

Figure 94 Categories of developed abilities that are a normal aspect of kayak hunting.

perform actions which fit into all categories. For example, in the scenario described by John Pedersen, physical fitness, technical ability, and environmental knowledge can be identified as simultaneously operating at once.

In terms of physical fitness, there are many requisite types associated with different aspects of kayaking, including arm and core strength, dexterity, endurance, and posture. Some types of physical fitness involve emotional development, and relate to hardiness, or the ability to cope and persist in conditions which are sometimes difficult, cold, and uncomfortable. Fitness is often a key aspect of certain technical abilities. For example, both the kinngusaqattaarneq and harpoon throwing require developed musculature and coordination of subtle compensatory movements. The physicality of technical skills draws together the overlap between physical fitness and environmental knowledge. For example, kayakers talk about learning to 'read' the waves and paddle efficiently through them, steering their kayaks primarily through their body.\(^{30}\)

There are paddling strokes used to maximize speed and efficiency over long distance, or to keep

\(^{30}\) For example, this was previously noted in comments by Jørgen Leander in Chapter 4.
the kayak tracking straight in a cross wind, and silent strokes designed for stalking prey and quietly positioning the kayak to strike. Some hunting techniques involve coordination of different hunters for support and safety or driving animals in a certain direction where another hunter is waiting ready to strike. For these, kayakers must learn what I have described elsewhere as 'team dynamic' – or the developed ability to interpret the intentions of others, how personal actions affect others in the hunting team, and how to communicate intuitively and silently (Walls 2012a). There are many potential dangers that a kayaker has to be able to perceive. Kayakers might have to navigate in conditions where they lose track of landscape features through heavy swell or in conditions where it is foggy or snowing. To intercept animals, they must be able to anticipate behavioural patterns and interpret subtle environmental cues. The coordination of these sub-sets of skill takes place in an environment which changes as the kayaker interacts with it, and they must respond and adjust their performance accordingly.

Kayak hunting is too complex and even dangerous to learn through trial and error. The risks of amateur mistakes are very high, and enskilment is necessarily a process of practice and assembly of sub-sets of skill. Dependence on tacit knowledge characterizes all subsets of kayaking skill. They are all sensorimotor skills, dependent on a high degree of learned ability; kinaesthetic awareness and embodied responsiveness can be identified in each of these. As with kayak construction and rolling, their acquisition by an individual is developmental and dependent on personal experience. The detailed accounts of kayak construction and 
kinngusaq	attaarn eq help to understand the process through which these are developed.

7.2 Individual Experience and the Taskscape of Broader Enskilment

For individuals, the process of enskilment in kayaking is characterized by the centrality of tacit knowledge, which cannot be de-contextualized from personal experience. A point I have noted several times in the preceding chapters is that the acquisition of skill in kayaking is not a passive process, and even from the earliest stages of enskilment a learner must develop their ability through their own agency. Some beginners seem to possess more natural talent than others, but all kayakers must partition skills into movements, identify weaknesses, sharpen their abilities, and develop experience with creative adjustment in performance.
Enskilment takes place immersed in the environment, where techniques are practiced in actual scenarios where they are used. Csikszentmihályi’s (1990) concept of ‘flow’ is an important part of the situated learning of sensorimotor skills in kayaking. A state of flow takes place where there are clear objectives and mechanisms for feedback through which individuals can judge the effectiveness of their actions in the environment and creatively adjust their performance to a task at hand. In the preceding chapters, there are many examples of small episodes of enskilment where this can be identified as taking place. For example in equalizing the apummat, builders must struggle against the material, perceive if the two pieces are bending symmetrically, and then adjust them accordingly. Another example is before the first attempts at rolling, when a beginner experiments with moving the paddle through the water creating the aalatsiluni sculling motion, learning the types of pressures they can exert through the paddle by testing and feeling the differential drag they can create at different angles. Through these engagements, situated in actual performance in the environment, individuals develop motor memory and experience coordinating perception and action.

Ingold’s (2000; 2011) concept of taskscape – specifically directed at enskilment in this dissertation – partitions the broader skill into smaller tasks, allowing a beginner to assemble personal experience with sub-sets of ability. The taskscape is an interpretive construct which helps to map out the process of development for individuals. The taskscape was identified as a key characteristic of the process through which tacit knowledge is co-constructed between learners and teachers for both kayak building and rolling. The taskscape is essentially a framework for experience; each task has clear objectives, allowing the beginner to focus on developing small aspects of ability. The taskscape is progressive, but not necessarily in a linear fashion; as experience is developed with each task, it gives way to new opportunities for perception and action. Through situated learning, beginners progressively develop kinaesthetic awareness and embodied responsiveness. From sculling the paddle, a kayaker can attempt the simple kinngusaqattaarneq, practicing the manoeuvres on each side, before moving on to more complex ones, gradually increasing their ability to respond skillfully in a situation where they are unexpectedly capsized. The completion of one task leads to another, and, as Ingold (2000: 195;
Figure 95 The broader enskilment in kayaking conceived of as a taskscape. In a moment of skilled practice, a kayak hunter draws on the entirety of their experience.
2011; 59) notes, an individual's progression through the taskscape has journey-like qualities, where a learner can see progress in their capacity to coordinate and react creatively to new situations.

A taskscape of broader enskilment in kayaking can be assembled to envision the complexity of the skill and the general process through which it is developed (Figure 95). Enskilment starts in childhood for most kayakers, and they begin participation in the skill through games that increase dexterity or fitness, such as the qajaasaaq games where they play kayak hunter and throw mock harpoons at targets. In preparation to begin learning, a kayaker can develop their fitness and coordination through the allumaariaqattaarneq. As documented in Chapter 5, the community emphasizes kayak construction as an important aspect of broader enskilment. Builders develop an embodied sense of the structural dependencies of their kayak; they can feel how it moves through the water, and have a tacit sense of possibilities for adjustment and variability as their skill develops. Once a kayaker has the right equipment, they can begin learning basic paddling techniques, finding their balance and feeling how subtle muscle movements affect the orientation and pitch of the kayak. Having developed some confidence, they can begin learning the basic kayak rolls and start throwing the mamagoq practice harpoon, eventually learning to use more complex weapon systems such as the mnaaq harpoon and avataq hunting float. With some of these basic skills mastered, a beginner can go out of the harbour with experienced kayakers and begin learning advanced skills through developing experience in the open environment. To hunt successfully, beginners must develop the ability to operate the weapons and equipment smoothly and safely, learning how to intercept and stalk their prey. Kayakers deepen their perceptive ability through personal movement and experience in the environment, learning to hunt different animals. Through the process of becoming hunters, kayakers learn how to navigate in difficult conditions, open their senses, and respond skillfully to slight changes in environment around them.

An individual's progression through the taskscape of kayaking is not necessarily sequential, and there are many entry-points to learning different sub-sets of ability. In the example of harpoon training in Chapter 1, the two boys were very early in their learning process, and there are many other more fundamental skills they would have to develop before actually being able to use the technique in a real hunting scenario. A kayaker may simultaneously work
on different parts of the taskscape at once. For example, a kayaker struggling to learn a particular roll might return to the *allunaariqatqaarneq* and find certain aspects of the rope exercises that help develop a particular aspect of fitness which will be beneficial. In some cases, kayakers may find that the root cause of a difficulty in practice is that their kayaks need to articulate better with their bodies, and they might adjust some parts to make the contact points suit their shape and style. There is an informal sense in the community of the general sequence through which a kayaker should develop different parts of their skill, but there are no strict rules to decide the point at which a kayaker is ready to start the next stage – the pace of that transition is determined by the learner.

At any point in time, an individual's level of skill is contextual to their experience, which can be represented as a personal taskscape. There are key moments in a kayaker's enskilment, recognized by the community as fundamental transitions in practice. For example, when a kayaker gets their first kayak, they become a *qajaraaq* (beginner at kayaking), or when a kayaker catches their first seal, they become a *piniartoq* (hunter). Figure 96 presents a hypothetical comparison that outlines the skill of particular individuals in four levels of ability: a *qajaraaq*, a *piniartoq*, a *qajavik* (expert kayaker), and a *Piniautaarsuag* (Great Hunter). In each case, their skill can be conceived of as increasing experience in the taskscape. For the most part, however, an individual's movement through the taskscape is not clearly demarcated, or ritually formalized by distinctive transitional moments. In working with the community and observing the progress of multiple individuals over the three field seasons of the project, I saw that there are many more recognizable categories of skills, which are not necessarily formal transitions that can be marked by a particular event. However, these levels of ability play an important role in the social dynamics of the community of practice, which is made up of beginners, experienced kayakers, skilled kayakers, expert kayakers, Elders, and Great Hunters.

At the earliest stages of learning, a beginner is completely dependent on the skilled community to start the process of enskilment. As the kayaker develops some of the basic abilities, they also start to gain independence. Once they are able to roll when capsized, it is not as necessary for them to be closely supervised, and they can begin to practice and hone their ability at their own pace, often practicing in coordination with peers. They start to move from being beginners to becoming experienced kayakers after having developed the basic skills and have gone through several subsequent waves of adjustment in their performance. Skilled
Figure 96 Increasing skill conceived of as personal experience in a taskscape.
Kayakers are those with the ability to move around in the open environment. They have enough skill that they can do this relatively safely, and are at a stage where their progression through the taskscape is independently paced, and in identifying their own weaknesses and thinking about ways to improve, they draw on their personal experience. In the modern kayaking community, skilled kayakers, are generally those who have some experience with seal hunting, and may have caught one or two seals, but are not yet at a stage where they can do this confidently. Expert kayakers, such as John Pedersen have been hunting for years, and have the confidence and ability to go out hunting with a predictable measure of success. Elders are individuals who have a vast experience with kayaking, but might not themselves kayak anymore – as noted in the Chapter 4, there are still Elders in the community today who grew up at a time when kayaking was the primary means of subsistence, and they were trained as hunters in their childhood. A Great Hunter, or Piniartorsuaq, is someone with an extremely high level of ability and personal experience developed through a lifetime of kayak hunting. A Piniartorsuaq is someone who can go out into the fjords and open ocean to hunt even the most dangerous animals in all types of weather. There are no Great Hunters in the community today, but there are experts and Elders in the modern community who learned from them, and with new generations of kayakers developing their skill and experience, there is the potential that there will one day be Great Hunters in the community again.

It is important to emphasize that there is no endpoint to enskilment, and even at the highest levels of ability, there is always the capacity for kayakers to become more skilled. Because of the dependency on tacit knowledge, the skill is never the same between individuals – indeed, as a developmental skill, it changes over the course of an individual's lifetime. In the community of practice, there are always as many degrees and types of participation as there are participants, because tacit knowledge is personally contextual. To describe practice in a way that deals with this non-linear nature of skill, the term 'peripheral participation' was introduced in Chapter 2 (Lave & Wenger 1991). Each kayaker, from the Great Hunters to beginners, and anyone who participates in the physical process in some way, can be considered a peripheral participant in the community of practice.
7.3 The Construction of Experience between Generations

Peripheral participation takes place through a framework, and in the community of practice where individuals develop similar experiences, there is an emergent intersubjectivity. The term taskscape has been applied to describe the process of enskilment, but it is important to reiterate that it is heuristic, which raises the question of how a framework for experience is constructed within the broader community of practice. While the knowledge involved in kayaking is personally contextual to an individual's experience, the process of enskilment is necessarily a 'collective enterprise' (Pálsson 1994). As already noted, a beginner is completely dependent on the broader skilled community to lay out the taskscape for them, to determine where they should start, what they should do to develop their skills, and when they are ready to move on to the next challenge in development. In rolling, for example, beginners are dependent on their teacher to rescue them, and they might struggle to get past a certain stage of development without the help of a skilled kayaker to coach them and direct their attention to particular aspects of practice.

As kayakers develop their skills, they reach a point where they can draw on their own experience to help others with learning. Reaching this stage is not necessarily synonymous with being an expert kayaker. For example, a teacher may be a very skilled kayaker, but still training to learn some of the more complex *kmugusaqattaarneq*, and while having some experience with seal hunting, they may not yet at a stage where they can safely go out alone. There are parts of skill that the teacher is actively developing, yet they are already a leader in the community.

In the community, there are many individuals who assist in teaching kayaking – it is generally a collaborative venture and most kayakers develop their skill with help from multiple teachers with varying levels of experience. As noted through the different episodes of enskilment, the community lays out the taskscape for individuals at the early stages. They decide when a beginner is ready to start, what aspects of skill a beginner needs to improve, and when they are ready to start learning another ability. In helping beginners to become skilled kayakers, teachers are not subscribing to a process that is set in stone. Rather, teachers draw on their tacit knowledge developed through their own process of training, as well as their experiences in the open environment in assessing what the learner must know, the scenarios they should prepare
for, and to which parts of their practice they should draw attention. Elders such as Aalibak Augustussen or Kristian Johansen might help beginners with construction in the clubhouse, skilled kayakers in their 20s and 30s with basic skills such as learning to roll, and experts such as John Pedersen to develop hunting ability in the open environment. The taskscape through which beginners work to develop their experience is itself co-constructed between generations of knowledge and does not exist outside of the collective experience of the community as a whole. Teaching harpoon throwing to a beginner, Aalibak showing a builder how to ensure the *apummat* are straight, or Lars Goliatsen teaching Aalibak to tighten the lashings on the *kiujaag* so tight that that his hands hurt, are all examples of this intergenerational exchange.

As a community of practice, kayakers form layered generations of knowledge, where each individual's skill is co-constructed through their own agency in navigating a taskscape constructed through the collective experience of previous generations. Each practice or technique that a kayaker learns – for example, making the *apummat* curve up to protect the deck from swamping, or the ability to roll without the paddle – may trace to a particular individual deep in the history of Inuit culture who first invented the technique through their own experience and added it to the skill by showing the next generation of kayakers. Yet, the skill cannot be conceived of as a pool of abstract knowledge that beginners subscribe to and internalize. Each individual who learns a technique discovers its value through practice, creatively adapting it according to personal experience, and where they find relevance they add it to the taskscape of the next generation they help teach. Kayak hunting is inherently an impermanent and adaptable skill, and there is the potential for each generation to deepen the nuances of collective experience, tightening the cultural connection between praxis and the environment through time.

Participants in the intergenerational community of kayaking develop similar types of physical fitness, and attune their senses to the same environmental subtleties, encountering their world through very similar circumstances. As a part of the physicality of daily life, kayaking becomes an aspect of the community's *habitus* – the dispositions which regulate individual action in the world (Bourdieu 1977). A shared subjectivity, or suite of abilities to perceive and respond which are unique to the community of practice, is emergent in the parallel experiences of individuals who participate in the physicality of kayaking. To place the emphasis on the physicality of this intersubjectivity, Merleau-Ponty's (1996) term 'intercorporeality' describes the dispositions and shared experience acquired through participation in the skill. Intercorporeality
exists where there is physical participation – it permeates all levels of participation in the community (no matter how peripheral) and grows stronger through enskilment and development of ability.

7.4 Community Perspectives on Intercorporeality through Time

Late one winter night, Johan Kristiansen was working on a kayak alone in the Nuuk clubhouse – a restored fishing warehouse in the old harbour. It was in the late 1980s, when Qaammat Kattuffiat was in its early days of development. Johan says it was his third attempt to build a kayak and he had several years of experience with basic paddling skills. He had just finished lashing the kujaaq (Figure 28, Chapter 5), and was so absorbed in the work that he had lost track of time. Suddenly, he became aware that he wasn't alone anymore – there was a man who had been standing behind him watching what he was doing. This surprised Johan because he would normally have noticed the sound of someone walking through the snow towards the clubhouse, and he hadn't felt the room get colder when the door opened. The man was very old and had the forward leaning posture that the Great Hunters developed from years of sitting poised in their kayaks. Johan didn't recognize him, but he could tell that he was from one of the settlements because he was wearing older clothes from the 1940s. Johan felt very nervous and unsure of what to say, so he offered the man one of his cigarettes. The man accepted it and walked over to the kayak and began looking over the frame. He looked at the joints, and then starting at the sujuan (bow), he ran his hand along the entire length of the newly placed kujaaq, never quite touching it. The man still didn't make eye contact, but Johan had the sense he was satisfied, and felt the kayak was well made. When the man reached the kingua (stern), he nodded and then went out the door into the night. Johan followed him to ask him who he was, but when he got outside the man was gone and he couldn't see any footprints in the fresh snow. Johan is a great story teller, and after what felt like a well-practiced pause, he laughed and finished telling me the story by saying "I've always hoped to meet that guy somewhere".
Johan's story nicely articulates the community's perspective on the intercorporeality of kayaking that has been echoed in many voices throughout this project\textsuperscript{31}. A well made kayak wasn't the only outcome of construction for Johan. Through technical choices and actions, he was building personal experiences that parallel those of his ancestors. The physicality of this process of building a kayak, learning to use it in the environment, and then applying that experience to modify the frame was drawing Johan into the community of practice. When the old kayak hunter traced the line of the \textit{kujaaq} with this hand, he could feel the scenarios through which it would perform. He was satisfied that it was made well, and the knowledge he drew upon to make that assessment was developed through a lifetime of experience as well as the experiences of his ancestors – a chain of overlapping generations of tacit knowledge construction that stretches back in time to the first Inuit who settled Greenland, and perhaps beyond. In Johan's perspective, there is still a large gap between his own knowledge and ability and that of the skilled hunters of the past. It is apparent to him that the skill intersects his life in a very different way than it would have for his ancestors who depended on kayaking for subsistence. However, the physical aspect of construction generates some level of intercorporeality. Through this rapport, he develops an understanding of his ancestors' lived realities. Outside of kayaking, Johan is a mechanic, and he works long shifts on fishing trawlers; over the course of the last 30 years, he has travelled the coast of Greenland many times over. Kayaking gives him a set of experiences through which he interprets the landscape of Greenland. He says that even from the trawler, he feels the physical distances between communities in his muscles, and perceives the complexities of the fjords and archipelagos in terms of opportunities and dangers for kayak hunting.

A similar view on the efficacy of the skill can be found at the beginning of this chapter, where John Pedersen describes how hunting from a kayak helps him to sense subtle geographical differences in terms of seal behaviours which would not be apparent from any other perspective.

\textsuperscript{31}Johan is Inughuit, originally from Qaanaaq in the far North of Greenland, and has always been interested in kayaking even though he was not taught the skill as a child. I stayed with Johan and his wife Mina in Nuuk in 2009 and 2010, and they helped considerably with getting the project started. This story was related to me one night by Johan, when we were discussing the types of knowledge the community develops by practicing traditional kayaking. Encounters with mysterious old hunters are a common theme in the modern community, and I have heard other kayakers relate very similar experiences in reference to the physicality of the connection to the past.
Of the relationship between his practice and Inuit communities in the past, he says: "I can feel how they had it, my old family" and "I feel a part of it". This transposing of dispositions developed through the physicality of kayaking to broader perceptions of the environment can be recognized in many of the other quotations from different kayakers presented in this dissertation. Indeed, it is apparent in the history and development of the modern kayaking community that their objectives in ensuring the persistence of kayaking are contextual to the present. As discussed in Chapter 4, the rebuilding of an intergenerational community where the skills of kayaking are taught is often cited as the primary success of Qaannat Kattuffiat. Kayakers in the modern community essentially see their practice as peripheral participation in a community of practice which extends into the origins of their culture.

I have previously noted convergence between the goals of archaeologists and the modern kayaking community in better understanding the past. However, there are important epistemological differences in the types of knowledge that kayakers are producing about the deeper history of Inuit culture. Drawing once again on Polanyi (1966), we can recognize the knowledge kayakers produce is tacit in nature, and emergent in personal experience. At the beginning of Chapter 5, the process of building a kayak was seen to be governed by what was described as 'hunting knowledge'. Rather than working towards a blueprint, or an external stock of abstract knowledge that defines the parameters of best practice, kayakers work from the collective experience of the community. Similarly, in constructing knowledge about the past through practice, kayakers in the modern community are not internalizing a particular historical narrative, or a pool of knowledge that can exist externally to the experience of any individual. In their conception of heritage, Inuit culture is not a timeless or static entity to kayakers. The past they reconstruct is imbued with the agency of many generations of hunters who had a deep knowledge of the environment developed through many lifetimes of experience and creative responsiveness.
Chapter 8
Kayaking, Skilled Practice, and the Agency of Inuit Communities in the Distant Past

In this closing chapter, I return to the fragmentary archaeological record of kayaking and address the question posed at the beginning: “what role does kayaking play in long term processes that shape the deeper history of Inuit culture?” Through ethnoarchaeological observations, made in the present, we have seen how the physicality of kayaking is an important part of intersubjectivity – how individuals come to certain dispositions, which the modern community asserts are distinctly Inuit and cannot exist outside of particular practices and personal experience in the environment. From an archaeological perspective, kayaking has a long standing connection with Inuit culture. The exact origin of the skill is not clear, but by 2000 years ago, Inuit ancestors in the Bering Strait participated in the physical process of enskilment in kayaking (Arutjunov et al. 1964; Chard 1955; Sergey et al. 1999). Kayak hunting was practiced by the Thule migrants as they explored and settled the Eastern Arctic, and the skill was locally adapted by each Inuit descendent group (Arima 1975; Golden 2006; Pedersen 1986). Through time, the practices of kayaking crossed many different events and periods leading into the present context of kayaking in post-colonial Greenland. Through participation in the physicality of the skill, there must have been some level of intercorporeality, or rapport, that was a defining aspect of how Inuit living very different lives in very different periods perceived and responded to the world around them.

To address this question is to explore the position of kayaking and the role of skilled practice in the longue durée of Inuit culture. I start by comparing the conceptions of time, process, and agency produced through the modern kayaking community’s practice, with those found in conventional archaeological narratives of Inuit origins and development in Greenland. I then re-establish the analogical potential that modern kayaking in Greenland has for understanding the dynamics of Inuit communities in the more distant past. The basis for analogy, I will argue, is in the importance of the physicality of enskilment in the constitution of the community through time. Where the archaeological record shows the skill was practiced, we can understand something about individual and social identity, experience, and intergenerational
exchange. I then draw on the ethnoarchaeological observations made throughout this dissertation to interpret the agency of the kayaking community in three very different times: the Thule migration, the Inuit diversification, and the colonial period. Using a technique developed by Nicholas David (2008), I draw on ethnoarchaeological analogy to create a narrative for each period, allowing some level of informed speculation to conceptualize the role of skilled kayaking in broader events and processes. The speculation is mitigated by critiquing the narrative, and I close the dissertation by considering new directions that archaeologists might investigate to further develop an understanding of Inuit agency through time.

8.1 Archaeological and Inuit Conceptions of Time, Agency, and Process

A point that I have revisited several times in this dissertation is that through kayaking the modern community is exploring heritage. The community has found that the practices of kayaking contain knowledge that cannot be communicated through text, museums, or even oral history, and in the development of *Qaannat Kattuffiat* the emphasis has been on the persistence of enskilment. As discussed in Chapter 7, enskilment draws kayakers into an intersubjectivity that is contextual to the physicality of practice; their knowledge of the heritage exists as intercorporeality – an intuitive sense of the lived experiences of Inuit communities in the distant past. This knowledge is intangible but developed through a nuanced and embodied understanding of the environment. As John Pedersen, a kayak hunter and businessman from Ilulissat, described at the beginning of Chapter 7, he can *feel* the experiences of his ancestors when he is hunting in his kayak. Through enskilment, John and other kayakers attune their senses, and come to embody responsiveness to very specific subtleties of Greenlandic geography and ecology. When stalking, for example, hunters intuitively anticipate sea-mammal behaviour and how the movement of their kayak will be perceived by their prey. Skilled kayakers are attentive to aspects of the environment that would not otherwise be apparent; they can react to changes in wave movement, navigate through icebergs and fog, discern slight changes in weather, right themselves when they capsize, and feel how their kayak performs as a network of structural dependencies. The sense of past processes for kayakers is emergent in practice, which
connects them to a deep history of collective experience and skilled responsiveness in a complex and impermanent environment (Ingold 2000).

This sense of the past can be contrasted with the perspective of time and process found in conventional archaeological narratives of the origins and development of Inuit culture in Greenland. In archaeology, precise tools for dating allow the construction of a temporal framework – for example, it can be demonstrated through radiocarbon dating that the first ancestors of the Inuit probably arrived in Greenland in the mid/late 13th century (e.g. Friesen & Arnold 2008), or that observable changes in material culture can be placed in chronological relation to other events such climatic change or the arrival of Europeans (e.g. Gulløv 1997). However, from this framework, archaeological narratives of Greenland have had a tendency to view time as a sort of container, which gets filled with homogenous cultural 'lumps', not unlike strata in an excavation profile. Through typology, the past is broken into sequential chunks, usually identified on the basis of material patterns such as harpoon types or house forms (e.g. Gulløv 1997; Holtved 1944; Mathiassen 1930). This archaeological framing of the past in terms of continuity and discontinuity is a perspective that Alfred Gell (1992) likens to beads on a string, where one consistent cultural entity precedes another, and it is imagined that there can be large periods of time where Inuit culture is static and unchanging. Pauline Knudsen (2005) has critiqued the conventional archaeological narrative of Inuit culture, noting that when assembled, it is primarily an account of external causation. Although the archaeological narrative describes changes through time, the underlying model of Inuit culture is itself timeless, and it is implicitly assumed to be a conservative entity, which changes only in reaction to external stimulus; Thule migrants are framed as either being pulled or pushed across the Arctic, changes in harpoon types

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32 I direct this discussion of time perspectivism specifically at archaeological narratives of Greenland, but note that it is relevant to the broader practice of archaeology, and a pertinent debate in contemporary theory (e.g. David 2008; Gamble 2013; Gosden 2013; Hodder 2011b; Ingold 2000; Lucas 2012; MacEachern 2013; Pauketat 2013; Robb 2013).

33 Pauline Knudsen is a Greenlandic archaeologist, now the director of the Nuuk Museum (Greenland National Museum). Her comments in the cited paper are particularly significant because they were directed at an edited volume on the prehistory of Greenland, which was assembled by archaeologists at the Danish National Museum (DNM). The volume is well illustrated, written without jargon, translated into Kalaallisut, and is meant to synthesize the broader archaeological perspective of Greenland's prehistory. The volume is the culmination of many generations of great archaeological work, but Knudsen's point that Inuit agency is missing from the assembled narrative is important to consider.
are explained as the result of culture contact, or transformations in the colonial period assumed to be a unidirectional process of acculturation.

One factor that enables archaeological narration of the past in terms of change and continuity is an implicit belief in transmission—a concept which I have taken particular issue with in this project. Where a particular technical process is practiced for a large period of time, archaeologists tend to assume a period of stability. For example, two individuals separated in time by 300 years but making a particular type of harpoon head are implicitly believed to be adhering to the same mental template or to be subscribing to cultural norms that were simply passed down through generations. We can invoke Polanyi (1958) and Pálsson (1994) to note that this is possibly a projection, onto the past, of academic conceptions of knowledge as something that can be packaged and handed between experts and beginners (see also Wylie 1988). As Pauketat (2001: 1) argues, "traditions do not simply exist without people and their struggles involved every step of the way"—a point that I hope is articulated as clearly in this dissertation. Indeed, 'typological urges' and the question of entities that we identify through examining changes in material culture remain pertinent topics in the broader practice of archaeology (Gosden 2013; Lucas 2012).

As demonstrated in this dissertation, the acquisition of skill in kayaking is not a passive process where knowledge is handed from one generation to the other. Indeed, the premise of the modern kayaking community is that there are forms of knowledge that cannot exist outside of personal experience in the environment. For kayakers, Inuit culture is not just a pool of interrelated meanings that explain how the environment works through rules, taboos, and norms. Rather, Inuit culture is at least partially an intuitive and sensory knowledge of the environment, which cannot simply be subscribed to. The perceptive abilities and dispositions in responsiveness, which the community asserts are distinctly Inuit, can only be developed through a process of co-construction between the skilled community and the environmentally situated action of learners. Kayakers find the relevance and meaning of techniques in their own practice, perhaps deploying that experience to help the next generation learn. As 'tacit knowledge' kayaking is a skill that must be re-grown with each generation, and perhaps a critical distinction between archaeological and Inuit conceptions of time and process is that, for the kayaking community, the past is imbued with Inuit agency. The skills they learn are developed through the collective experience of many generations of hunters, with each kayaker developing their skill.
through the guidance of the previous generation, going out into the environment, finding relevance in the technique through their own experience, creatively adapting it, and helping the next generation to learn. This heritage transposes meaningfully to life in the present; even though the skill is no longer linked to subsistence, Inuit kayakers embody a heritage of resilience and creative responsiveness in both the natural and social environment.

Thus, there are two narratives of how the past unfolded. Archaeology has a very precise notion of time and place, which allows for sequencing of particular events, yet has had a tendency to overlook Inuit agency in explaining process (Knudsen 2005; Toft & Seiding 2013). In contrast, the narrative embodied by kayakers is an intuitive understanding of the agency of past Inuit communities as layered but perpetually changing generations that come into knowledge through practice. I wasn’t able to become a skilled kayaker during the fieldwork, but in witnessing the dynamic creativity involved in enskilment, participating in construction projects, and interviewing kayakers about their perceptions of practice and heritage, I have often thought about how the two perspectives can be blended.

8.2 Building a Narrative of Inuit Kayaking Since the Thule Migration through Relational Analogy

One way to sharpen archaeological narratives to include the agency of skilled practice is to deploy ethnoarchaeological observations as an analogy for interpreting Inuit culture at different time periods. As demonstrated by Allison Wylie (1982, 1985, 1995), archaeology is fundamentally an inductive science because we construct knowledge about the past through analogical inference – even where we think we don’t. It is important to recognize and evaluate the position of analogy in archaeological interpretations of process because induction contains the potential to significantly replicate assumptions and biases. In her critique of the archaeological narrative of Greenland, Pauline Knudsen (2005) also warns there is danger in the uncritical use of analogy in a direct mode – casual applications of ethnographic analogy, for example, have contributed to implicit assumptions of Inuit culture as a timeless cultural entity, passive between major externally triggered events (see also David & Kramer 2001; Pauketat 2001; Wobst 1978; Wylie 1985). The potential for archaeologists to essentialize is especially
prevalent when assuming ethnographies/ historic accounts (primarily written by Europeans) to be totalizing representations of Inuit culture in the first place, and then working backwards in time through the direct historical approach as a basis for interpreting the archaeological record. However, Wylie (1985) notes that analogies can be scrutinized, and their position in interpretation can be evaluated and strengthened to generate better narratives of past processes. She stresses the importance of establishing relational analogies, which are not just based on superficial similarities or assumed genetic/geographical continuity. Relational analogies infer knowledge about the past based on the underlying structures that account for similarities and differences between ethnographic and archaeological contexts.

The basis for building a relational analogy between the modern kayaking community and Inuit communities in the more distant past is in the physicality of the skill. In Chapter 4, I have traced the development of modern kayaking, and, through examining some of the practices that kayakers find meaningful, I have argued that the physicality of the skill plays a role in the constitution of the community through time. In the archaeological record, as summarized in Chapter 3, kayaking is represented by diverse material signatures ranging from actual fragments of kayak frames, to pieces of associated equipment, stone features associated with storage and training, musculoskeletal stress markers, etc. Through these signatures, archaeologists can identify the presence of kayaking and in some cases can develop knowledge about the techniques through which they were used at different times. However, what the material record of kayaking also indicates is physical participation in a community of practice. While Inuit living in different times and places may have had very different lives, they participated in very similar processes of enskilment. Ethnoarchaeological observations of enskilment in the modern kayaking community can be deployed as an analogy to understand certain dynamics of past communities that practiced kayaking, including the nature of their environmental attention and the intergenerational construction of knowledge. Through relational analogy, we can infer the agency of skilled practice in concurrent processes at different points in time.

To create an archaeological narrative that better accounts for the agency of individuals, a technique that Nicholas David (2008) has deployed is to simply write an account of process based on his intuitive impression of events likely to have taken place at the DGB site in Cameroon. Having conducted decades of both archaeological and ethnoarchaeological work in the region, David creates a speculative account of complex social dramas to illustrate how he
envisions agency in the events involved in the construction of ceremonial architecture. David uses the narrative as a device to analyze the interplay between individual agency, social dynamics, and long term environmental patterns. He then critiques the narrative that he has produced, and leaves it open for the next generation of archaeologists working at the site to develop. An advantage to this approach, which is especially relevant to creating narratives of agency in Greenland, is that it departs from a fixed tone of factual finality. Several other archaeologists attempt similar techniques to examine the complex factors of agency at work in particular historical processes, and it can be noted that it is most effective where the archaeologist critiques the narratives they create or leaves them open for further development (e.g. Deetz 1977; 1998; Edmonds 1999; Van Dyke 2013).

As a means of applying the research from this project to the archaeological interpretation of Inuit origins and development in Greenland, I've also created a speculative narrative of the role that kayaking would have played in significant events in Inuit origins. The narrative animates the archaeological background presented in Chapter 3 and is broken into three parts which explore the efficacy of kayaking during the Thule migration, the Inuit diversification, and the colonial period separately. In each part, I draw on ethnoarchaeological observation of the dynamics of the community of practice in the present to interpret the role of kayaking in broader processes and events. I save the critique of the narrative till the end, but reiterate here that the intent is to produce something that can be re-adapted, and is not meant to have the totalizing finality that archaeological narratives often commit to in sequencing past processes. There are weaknesses to the narrative, as well as clear omissions, but these are areas where the narrative can be improved and developed. I think the exercise is beneficial in developing an account of the remarkable resilience and creativity underlying the origins and development of Inuit culture in Greenland.

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34 A semblance of this approach can be found in the SILA's (the Arctic Centre at the Danish National Museum) recent collaboration with Greenlandic artist Nuka Godfredsen in the creation of a graphic art series depicting events such as the first peopling of Greenland (Godfredsen et al. 2009). While there has not been overt discussion of the role that it plays in how archaeologists interpret past processes, the influence of the work can be identified in later publications (e.g. Gromnow 2012).
8.2.1 Narrative Part 1: The First Thule Migrants in West Greenland

Conceptualizing kayaking as a community of practice helps to shed light on some of the experiences of the first Thule migrants who explored West Greenland in the mid/late 13th Century. By the 'Thule migrants', here, I mean quite literally the pioneering communities – the first Inuit families that moved into West Greenland and eventually chose to settle there, drawing others to the region through time. The conflation of dates for the Thule migration into a relatively short period (perhaps as small as several decades) is one of the most important recent developments in the archaeology of the eastern Arctic (Friesen & Arnold 2008). In Chapter 3, I noted that one implication is that the dynamic cultural changes and regionalization of Inuit groups during and after the Thule migration probably occurred at a pace that individuals would have observed and participated in within their lifetimes. The impetus of the Thule migration has often been framed by archaeologists in terms of external factors such as environmental change or the lure of trading iron with the Norse/Dorset, etc. However, the discovery of new environmental conditions, the reinvention of skills and traditions from the Bering Strait, and decisions on the part of a community to settle one region over another must have all been processes that were shaped through individuals’ conscious participation. In this context, it is interesting to consider the role that skilled practice through kayaking would have played in some of the events that must have taken place.

Thinking about the importance of kayaking during the Thule migration directs attention to the generational composition of early Inuit communities in Greenland. Through the ethnoarchaeological chapters in this dissertation, I have demonstrated how kayak hunting depends heavily on personal capacities for awareness and response which can only be developed through situated learning. As seen through the learning of skills such as *kinngusaqattaarneg*, enskillement is a process of co-construction between beginners and the broader community's collective intergenerational experience of the environment. For early Thule communities in Greenland, the dynamics between generations of skilled practice would have been quite different because the geography and ecology would have been entirely new to them. Aspects of the environment which are important considerations for kayak hunting, such as the nuances of weather patterns, navigational challenges, locations of hunting grounds, patterns of animal movements, or the timing of seasonal events would not yet have been fully understood.
However, the earliest communities in Greenland potentially included some of the most experienced kayakers that have ever lived. Over the course of their lifetimes, the most skilled kayakers in the community would have travelled thousands of kilometers, hunting in a diverse range of locations and conditions across the eastern Arctic. Indeed, given the timing of the Thule migration, it is a distinct possibility that the eldest generations in the community included individuals who had been born, raised, and perhaps even trained as kayakers in the Bering Strait region. While early Thule Inuit would not have benefitted from the accumulative generations of local tacit knowledge seen in the present, they would have had a very broad perspective in terms of circumpolar experience.

In relation to most of their descendants across the Arctic, Thule kayakers must have had a comparatively high degree of skill. As detailed in Chapter 3, the archaeological record contains many clues that suggests this was the case. Thule kayakers hunted a very broad range of animals, including a variety of sea-mammals, waterfowl, and caribou (Coltrain et al. 2004; Grønnov 1986; Savelle & McCartney 1999). They were dependent on kayak hunting for year-round subsistence, including in the winter when they likely used their kayaks at the edge of the ice floe or at polynyas (Morrison 1993; 2009; Schledermann 1980). Some of the hunting techniques that Thule kayakers participated in must have been very dangerous (e.g. Desjardins 2013). For example, Bowhead whale hunts — which seem to have been conducted in coordination with umiaks — must have involved a great deal of training to participate in. Most Inuit descendant groups in the eastern Arctic reduced their dependency on kayaks through time, as new winter hunting techniques (such as breathing hole sealing) relegated kayaking to summer months (Dawson 2001; Morrison 1983). West Greenlandic Inuit are an exception; in terms of seasonality of kayaking and the broad range of animals that they hunted, West Greenlandic kayakers are probably the closest correlate through which the characteristics of Thule kayaking skills can be understood.

Like West Greenlandic Inuit, Thule dependence on kayaks probably meant that kayakers needed a high degree of ability to go hunting on a daily basis, even in poor conditions, throughout the year. It seems likely that abilities such as rolling during a capsize would have been equally crucial for Thule kayakers. Thule kayak hunters used varieties of the same norsaq-launched weapons including the niuq (bird dart), alligaq (bladder dart), angugiaq (lance), and the unaaq/avataq system (harpoon and hunting float) (Figure 12). This complex array of weapons —
some of which take a great deal of training to use – was probably also carried on the deck of the Thule culture kayaks, in order to allow for opportunistic hunting of a variety of animals. However, a likely point of contrast with West Greenlandic Inuit is that Thule kayakers may have emphasized more generalized abilities, especially in terms of navigating and hunting in unfamiliar territories. They needed to be able to have a skill that was highly responsive to new environmental conditions.

As with descendant Inuit communities across the Arctic, enskilment in kayaking was probably a lifelong process for Thule kayakers, which began with early development of fitness and dexterity. Indeed, the presence of kayak toys and stone kayak outlines where qajasaaq games could be played, suggest that kayaking was an important aspect of childhood (Mathiassen 1930; Schledermann 1971). A key observation established in the ethnoarchaeological part of this dissertation is the idea that kayaking is dependent on tacit knowledge, which must be reconstructed in the personal experiences of each generation. To understand the dynamics of intergenerational exchange, as summarized in Chapter 7, I drew on Ingold's (2011) concept of the 'taskscape' to understand how skilled kayakers deploy personal experience in creating a framework through which beginners can develop their own experiential ability. For a migrant community that did not necessarily know the environmental conditions of the locations they would encounter in the near future, teaching the skills of kayaking must have posed certain dilemmas. In the present context, we have seen that kayakers train for moments in their practice where they must respond skillfully and creatively to the contingencies of unpredictable situations. Even in the context of Greenland, where there have been many generations of kayakers adding to the collective experience of the community, environmental transiency is an important aspect of enskilment, and there is a sense that there are scenarios that even the best kayakers cannot fully prepare for. I think that this emphasis on adaptability would have been accentuated for Thule kayakers. Preparing for unpredictable scenarios, attuning the senses, opening perceptive abilities, developing personal fitness and dexterity, and recounting/discussing hunting scenarios must have been very important parts of Thule kayak enskilment. Most of these are virtually invisible archaeologically, but Hawkey and Merbs' (1995) identification of stress patterns on skeletal material from Thule period males may be an indication that personal conditioning was very important for Thule migrants.
Kayaking must have been an important aspect of social and individual identity for Thule migrants. Developing hunting skills, or the ability to prepare and sew waterproof skin covers, probably marked stages of increasing connection and importance for both genders to Thule communities. I would speculate that skill as a kayak hunter was an important aspect of standing in the community as it was for later Greenlandic Inuit communities in the historic period (e.g. Nansen 1893; Petersen 1986). In the present context of kayaking, competition is an important part of learning – it acts as a mechanism for feedback, which helps kayakers assess their abilities in relation to others, and it also helps in the development of emotional investment. There is the suggestion in Thule art that bowhead whale hunting may have been closely linked to personal achievement; engraved hunting scenes commonly depict the moment a hunter harpoons a bowhead whale (McCartney 1980:522-524; Whitridge 1999). It is interesting to compare the Thule depiction of bowhead harpooning to the later prominence of *nusutsinmeq* – the scenario where a kayaker is dragged through the water if the harpoon line becomes tangled around the kayak – in Greenlandic art (Figure 14). In Chapter 6, I described and illustrated the attempts by Jaffet and Kummunguaq Davidsen to perform a simulated version of the manoeuvre as a part of the competition. What I hope was apparent in those scenes is that it is one of the moments where a kayaker’s capacity to respond creatively to a scenario at hand is most visible. During *nusutsinmeq*, the kayaker cannot depend on procedural memory, and second for second, they must coordinate and adjust their perception and action. There are several accounts in the historic period of individuals deliberately hunting with this method as a demonstration of prowess and even spiritual power (Fabricius 1962; Nansen 1893). Bowhead whale hunting likely had many meanings and purposes for Thule communities – subsistence not being the least. However, a possible layer of meaning is that like *nusutsinmeq*, it may have been a benchmark or a dangerous scenario that kayakers train and work towards, developing their capacity for creative ability and response. As with *nusutsinmeq*, bowhead whale hunting might have emphasized the open-ended nature of the skill, and it would have been seen as a lifetime achievement to harpoon a whale or to organize and lead a hunt.

Kayaking may have been an important facet of interaction between the Thule migrants and the peoples that they met who were already living in the eastern Arctic. There is chronological overlap, and some suggestion of varied interaction between Thule migrants and the Late Dorset. Thule migrants seem to have adopted some Dorset skills and technologies, such
as snow houses and winter breathing hole hunting\textsuperscript{35}. The placement of early Thule winter sites near the ice floe edge and polynyas probably drew on environmental knowledge acquired from the Dorset – either through direct communication or through Thule learning to read and interpret Dorset archaeological remains. Additionally, there is some suggestion in the genetics of later Inuit populations that there was some degree of intermarriage (Helgason et al. 2006). Thule kayaking skills may have played a role in the dynamics of how social interaction occurred. As a skill that requires years of careful training that begins in childhood, it probably would have been much harder for Dorset to take up kayaking than it would have been for Thule to adopt Dorset hunting practices and snow house construction, or locally situated knowledge of animal behaviour and patterns of movement\textsuperscript{36}. It is probable that Late Dorset had some type of skin watercraft – as discussed in Chapter 3 – but whatever their form, it seems unlikely that these were used in comparable high-performance hunting strategies to those of Thule kayakers. The social importance of kayaking skills in Thule communities may have also made it difficult for Dorset men to simply join a Thule family, whereas Dorset women might have had detailed knowledge of local considerations for skin work and could have contributed significantly to the community of practice. Kayaking would probably have also characterized some aspects of interaction with the Norse. There is strong evidence that there was trade between Thule and Norse in West Greenland, and that there was some flow of traded materials back into the eastern Arctic (Mathiassen 1930a). Through kayaking, Inuit in West Greenland would have used the landscape in many ways that the Norse did not. There is no reason to assume conflict between the two groups, but, as discovered by Frobisher, skilled Thule hunters were not necessarily passive and probably would have posed a formidable threat if provoked – this may have also been an important aspect of the dynamics of their interaction (Oswalt 1999).

From the fragments of frames found in archaeological sites, it can be inferred that Thule Inuit built kayaks with the same general structural components that all Inuit kayaks share, including \textit{apunmat}, \textit{ajaavi}, \textit{tippit}, \textit{kujaaq} and \textit{siannii}. As demonstrated in Chapter 5, there can

\textsuperscript{35} See Park (1993) for an alternative view.

\textsuperscript{36} This is not to suggest that Dorset didn't have their own unique capacities for awareness and response that Thule Inuit would have struggled to adopt.
be a great deal of variability in how these components are assembled, and the fragments of Thule kayaks do not present enough inferable characteristics to permit comparison to particular Inuit designs. However, there is often an implicit assumption that Thule kayaks would have been the 'archetypal' form for Inuit kayaks, and that all Inuit versions are local adaptation and iterations of a single original Thule design, brought from the Bering Strait (e.g. Golden 2006; Heath 2004). The ethnoarchaeological account of kayak construction that I presented in Chapter 5 raises a number of considerations for addressing the question of a 'Thule type'.

In looking at the construction of kayaks, we have seen that kayaks are inherently adjustable. There is a cycle where an individual's first kayak is designed by drawing on the tacit knowledge of the community. As a kayaker develops their own experience, their kayak is adjusted, modified, and repaired over the course of its use. In contrast to the typological urges of archaeologists, which tend to discern variation through properties of the 'terminal form', kayakers understand design variability in terms of the interplay between a network of structural dependencies and performance. Skilled kayakers are also builders, and they can feel how their kayak moves through the water, and how it performs in particular scenarios. Similarities in design are not necessarily the result of builders adhering to a particular conceptual schema. Rather, local convergence of form and technique is the result of accumulative generations in the same environment, of many builders refining their kayaks according to their experience and teaching the next generation, who in turn build on their experiences. In contrast to later Greenlandic Inuit, Thule kayakers would not have known the local conditions where they would use their kayaks when building them. However, as previously noted, they probably would have had a comparatively broad level of geographical experience to draw on.

For Thule builders, the cycle of construction, personal experience, repair/modification, and teaching was concurrent to travelling many thousands of kilometers and hunting in very different environments. For this migrant population moving into new areas that they knew little about, there must have been a tremendous potential for variability and altering of designs – it seems unlikely that Thule builders were wedded to a particular tradition of building which originated in the Bering Strait. Indeed, Thule migrants would have found they did not have the same access to driftwood (which is far more abundant in the Bering Strait) in the eastern Arctic (Arnold 1994). Claire Alix (2009) has suggested that early Thule migrant communities struggled to procure the straight-grained pieces of wood ideal for the construction of kayaks and other
technologies such as umiags and composite bows (see also Gardner in Crawford 1983). At times, Thule builders may have had to make compromises according to material availability, which might have affected the cascading decision process through which they compensated to retain desirable performance qualities. With these considerations taken together, I would propose that there would not have been an 'archetypal' Thule kayak as such, although there may have been general characteristics suited to their high mobility. Like Greenlandic kayaks, Thule kayaks must have been highly personalized and carefully fitted to specific individuals to allow control in complex manoeuvres such as rolling or paddling in rough weather. However, Thule kayak designs may have been more generalized to compensate for the variety of conditions they were likely to be used in. Thule kayakers might have favoured efficiency in long distance paddling over manoeuvrability. Thule kayakers would not have benefited from the local navigational knowledge that Greenlandic kayakers eventually acquired, and they could not depend on their community to know where to find them if they ran into an emergency. Thule kayakers may have had to carry some supplies with them for such emergencies – and the designs might have been a bit larger than later Greenlandic kayaks to allow for storage within the kayak.

Kayaking is a unique means of moving in relation to a complex environment. In looking at the cycle of kayak construction and environmental responsiveness, it seems intuitive that kayaking would have been an important aspect of how the Thule perceived the new environments that they encountered. Kayaks must have characterized the speed that Thule hunters moved through the landscape, the locations they could access, the materials they required, the circumstances through which they encountered sea-mammals, and even many of the scenarios through which they depended on each other. Indeed, it was probably the case that kayakers would go ahead of families, to scout new areas suitable to inhabit for short or long term stays. Families would then follow in umiags. Kayaking would have been an important aspect of where individuals' senses were attuned, and the value of different landscapes would have afforded in terms of kayak hunting. The skill must have played a critical role in the decision to settle a particular location.
8.2.2 Narrative Part 2: Kayaking and Place Making During the Inussuk Phase

The Thule migrants, who may not have been a homogenous cultural entity, eventually settled many different places across the eastern Arctic. Through time, there was a process of transition, eventually resulting in many regionally diverse descendant Inuit groups (Figure 7, Chapter 3) (Friesen 2010). This diversification seems to have been a highly variable process, but a general pattern is that the Thule/Inuit transition is characterized by regional specialization of subsistence practices and the emergence of unique and locally situated identities. In West Greenland, the transition between Thule and the historically known Kalaallit Inuit, between the mid 1200s to the late 1500s, is called the 'Inussuk phase'. Inuit families during the Inussuk phase were much more sedentary than their migrant ancestors. They lived in semi-permanent house structures at sites that they re-occupied over intergenerational periods of time, travelling seasonally to social aggregations in other communities or journeying deep into the fjords for annual caribou hunts at inland crossing sites (Grønnov 1986; Gulløv 1997). In general, community life in the Inussuk period was characterized by daily hunting forays, where kayakers would travel to local seal hunting grounds. There appears to have been some interaction with Norse settlements in the earliest periods, as seen through items which were likely traded, such as iron and wood (Gulløv 1997; Mathiassen 1930a).

The Inussuk phase is another period where archaeological narratives of transition and cultural change tend towards external causation. Indeed, archaeological models of the period are based primarily on observable changes in house forms and harpoon types – some of which seem to change abruptly. Any perceived variability in the material culture of early Inuit communities in Greenland is explained as either adoptions resulting from culture contact with Dorset and Norse or an 'archaic' trait tied to distinct Alaskan progenitors (Gulløv 1997). Again, the implicit

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37 It is often referred to as the Inussuk culture but I prefer to use the term 'phase' to move away from a totalizing view, cleanly separated from the Thule migration. The term originates from Mathiassen's (1930a) 'Inussuk culture' which was thought to have developed in the Upernavik region, in part through the external influence of Norse interaction. Darwent et al. (2007) and Lemoine & Darwent (2010) seem to favour dropping the term 'Inussuk' to emphasize continuity from the earliest Thule migrations, but I have retained the term here to emphasize a critical distinction between migrant populations and resident populations of early Inuit in Greenland.
assumption is that Inuit were passive and permanently wedded to traditions that constrained their patterns of living until something new was introduced to them. It seems likely that observable changes during the Inussuk phase are better understood as rapid indigenous developments on the part of a migrant community who had consciously made the decision to settle in Northwest/West Greenland. Indeed, the apparent abruptness of some changes, such as living in more permanent structures, suggests that these transformations likely took place within the lifetime of individuals.

One way to elucidate the active role of kayaking and skilled practice in the development of West Greenlandic cultural uniqueness is to understand the transition as a process of place-making. As noted in the first part of the narrative, kayaking must have been an important aspect of how Thule migrants perceived the new ecologies and geographies that they explored. The Thule, as a migrant population, had sought areas close to open water during the winter, at polynyas and ice leads across the eastern Arctic. The Davis Strait currents which warm water along the coast of West Greenland would have offered them many different opportunities for year-round kayak hunting. In the north, there are many polynyas and stable ice floes which transition to year-round open water south of Aasiat (see Hannah et al. 2008; Schledermann 1980). The complex networks of fjords, each with their unique ecological patterns, and microclimates such as Disko Bay, which have a rich abundance of animals in all seasons, would have offered the Thule migrants ideal hunting grounds. There is even comparatively more driftwood, carried to the shores through the Davis current, and local species of shrubs with some construction utility, as demonstrated by the proliferation of wood in early sites (see Chapter 5, table 2)(Mathiassen 1930a:171). There would also have been unique opportunities for trade with the Norse for iron, wood, and other valuable materials. Drawing on their vast circumpolar experience developed through migration, Thule communities must have immediately seen many potential opportunities in West Greenland. For the first Inuit families that settled there, it must have seemed like an oasis. The decision to stop migrating and make a home and a new beginning in West Greenland was a conscious decision on the part of a community.

While the first generations of Inuit living in Greenland would have been able to apply the generalized skills and circumpolar experience derived through the migration, they would have known little about the particulars of local environments. I surmise that kayaking must have played a critical role in the process through which early Inuit communities acquired environmental knowledge about the diverse new ecologies and geographies – and not just in
terms of abstract knowledge, but also the sensory, kinaesthetic, and perceptive knowledge that can only be developed through physical experience. By hunting with kayaks, the first generations of Inuit in Greenland were developing an increased knowledge of the intricacies of their new environment, learning to sense and interpret subtle changes in the weather, understand seasonal patterns of animal behaviour, how to navigate local geographical challenges, where to position settlements in suitable proximity to hunting grounds and travel routes, etc. The cycle of kayak construction, personal conditioning, and adjustment of performance through personal experience must have resulted in a great deal of creative responsiveness on the part of the community. As communities became more locally situated, kayakers would have begun adjusting their kayaks to local patterns of wind and wave movement and training for particular scenarios based on locally situated experience.

The first generations of Inuit in West Greenland would have also begun to train children to become kayakers. In the modern kayaking community, I have shown how enskilment is an 'education of attention', through which knowledge is reconstructed through personal experience between each generation (Gibson 1979). The skilled community draws on tacit knowledge to create a framework through which learners find relevance of technique in their own practice. The taskscape constructed by skilled kayakers in early Inuit communities would probably have been based on both older migrant and newer local experiences. Subsequent generations of kayakers would have built on that framework, finding relevance in techniques of the previous generation and adapting them through their own experience, perhaps even as the environment around them changed. Through time, individual subjectivity – unique capacities for awareness and response – would have become more tightly interwoven with the local environment as tacit knowledge and sensory attuning deepened with the development of an intergenerational community.

This is not to suggest that the development of place occurred in isolation or that Inuit communities became fixed on the landscape. Indeed, it was probably a process that concurred with extensive interaction between communities. There are indications of a long standing pattern of seasonal aggregations associated with trade, whale hunting, and social festivities on the West Coast (Birket-Smith 1924; Gulløv 1997). Family politics and intermarriage probably resulted in frequent movements of people between communities. Indeed, this was a well established pattern during the earliest European encounters with Inuit in Greenland in the later historic period (Crantz 1767; Egede 1745). As noted in Chapter 4, there is an oral history of kayak competitions
that stretches beyond the first European accounts in the 1500s. I would speculate that kayaking competitions and demonstrations of skill were probably prominent features of festivities at seasonal aggregations. Kayak races, rolling demonstrations, and *allunaaritâqatâarnng* competitions, not unlike *Qaannat Kattuffiat's* championship today may have been an important aspect of regional interaction. Great Hunters would be known by reputation along the coast, and Inuit from different communities would have been eager to see them compete and compare their abilities with other hunters. As for the modern kayaking community, competitions would have been an important mechanism of developing the community of practice. Kayakers would have been able to compare different skills, learn techniques used in different regions and then find relevance and adapt them to their own local practices of hunting.

Perhaps the critical distinction between Thule Inuit migrants and early Greenlandic Inuit in the Inussuk phase is this development of an intergenerational community living in the same environment, developing collective experience through time. Early Greenlandic Inuit were from somewhere; they had a home territory where their senses were attuned, where they could best perceive and respond intuitively to the world around them. This intergenerational weaving of social and individual identity with action and practice in the environment is something that would have deepened through time. The perception of the environment for kayakers in the Inussuk phase can be viewed not just as an abstract set of knowledge that one can simply subscribe to (e.g. Henshaw 2003b: 220). Rather, it is a sensory and intuitive knowledge, which is developed through a framework for experience that is contextual to a long intergenerational history of creative responsiveness to the environment.

### 8.2.3 Narrative Part 3: Kayaking and Indigeneity in the Colonial Period

Having co-existed with Norse until the 1400s, Greenlandic Inuit were again brought into regular contact with Europeans by the late 1500s. Renewed interest in Greenland was fuelled by a variety of ambitions, which were ultimately colonial in nature. The colonial period saw the introduction of European whaling, the arrival of missionaries, development of trading posts, annexation by European countries, colonial governance, modernization, and economic development policies, all of which eventually culminated in the modern context of Greenlandic
independence. Inuit life changed significantly during this time period. However, in both archaeological and historical accounts of the colonial period, the removal of Inuit agency in narratives of past processes is particularly clear (Toft & Seiding 2013).

Accounts of Inuit culture during the colonial period generally assume unidirectional change out of a traditional and timeless past and into a European defined context of modernity (e.g. Gad 1973). Tropes of acculturation, assimilation, and passive adoption of new technologies are often described almost entirely through European sources. In the broader narrative of the colonial period, Inuit seem to exist on a separate timeline from Europeans; for them, time is still measured in continuity and change, with periods of stability broken up through the agency of Europeans – first contact, the arrival of the first missionary, the development of the first trading post, the development of governances, etc. This tendency to remove agency of Indigenous peoples in narrating colonial interactions with Europeans is, of course, not exclusive to the archaeology of Greenland. Archaeology, as several authors have noted, can be deployed to counter the biases of historical narratives, to understand what Neal Ferris (2009) has described as 'the Native lived experience of colonialism', which develops interpretations beyond timeless passivity (see Cabak & Loring 2000; Fricscn 2013; Frink 2007, 2010; Gosden 2001; Gulløv 2009; Toft & Seiding 2013; Silliman 2001; 2005).

For our purposes, the question here can be 'how did skilled practices such as kayaking characterize Inuit participation in events during the colonial period?' This is potentially a very broad topic, which could in itself be a dissertation. As noted in Chapter 3, kayaking was practiced as a primary means of family subsistence throughout the colonial period, with very minor modifications in construction materials and adoption of new weapons between the late 1500s to mid 1900s. Beneath particular European-triggered events, through which the colonial period is usually partitioned, Inuit were practicing kayak hunting. Indeed, kayaking figures prominently in many of the events that we tend to frame as being pivotal, European-triggered, moments. For example, Hans Egede (1745), a missionary and leader of the first European community in Greenland (after the Norse), wouldn't have survived the first winter without the assistance of kayak hunters who brought him food. The eventual network of European trade

38 See Gosden (2004) for a global perspective on this tendency.
posts – many of which have developed into the settlements of today – mapped onto Inuit residential sites in the mid to late 1700s, which were locations that had been carefully chosen in their proximity to kayak hunting grounds. Throughout the colonial period, trade was dependent on products that were mostly procured by kayakers, and the value that many of the materials and tools that Inuit purchased were relevant to kayak construction. Indeed, the entire administrative apparatus of the early colonial government depended on skilled kayakers, employed through the *Kajak-post*, who delivered messages and mail between communities. One of the most effective strategies of the missionaries was to use converted catechists who were skilled kayakers and could reach remote settlements that Europeans could not. So there are many different potential events to track the efficacy of skilled kayaking and to think about the dynamics of the community of practice in relation to any of these processes.

The position of kayaking in long-term contestation of the nature of Inuit indigeneity during the colonial period of Greenland is one topic that is particularly relevant to the context of the modern kayaking community. Colonial policy was often based on the assumption that Europeans knew what was best for Greenlanders – religion, language, law, and eventually Danish education, were all introduced with the assumption that they were essential and superior to Inuit knowledge (Nuttall 2008; Pedersen 2009). Yet, an underlying contradiction is that the entire colonial venture was dependent on the skilled practice of Inuit, who had an intimate knowledge of Greenlandic ecology and could intuitively sense the world around them, hunting in any conditions, anticipating the movements of animals, and accessing parts of the landscape that Europeans could not. These types of tacit knowledge were never appropriated by Europeans. Indeed, for children of mixed descent, the knowledge and skills that were most important for connection and identity in the community were developed through the Inuit sides of their family (Toft & Seiding 2013). Although many Europeans wrote about kayaking and described some of the abilities, there are very few instances where they attempted to learn. Some of these examples ended in tragedy, and there are no cases where they became skilled hunters (e.g. Fabricius 1962; Nansen 1896). The relationship between kayaking and the ongoing definition of indigeneity in Greenland is evident in the modern kayaking community's revitalization of the practice. We can see that, through the colonial period, there has been a broader debate between 'Danish ways of knowing' and 'Inuit ways of knowing' (Graugaard 2009; Nuttall 2010; Pedersen 2009). In the context of the present, where there are many looming questions about Arctic sovereignty and
resource development in an environment that is rapidly changing, the kayaking community reaffirms Inuit culture as something that is dynamic and resilient. Kayaking contests static and timeless models of Inuit culture, which frame indigeneity in genealogical terms, or as a pool of symbolic meanings and traditions that can simply be unsubscribed to in favour of another culture’s concept of modernity. The modern kayaking community re-establishes long term cultural connections to landscape that are developed over generations of having a close relationship with the local environment, and being dependent on and intimately aware of its subtle characteristics, nuances, and changes.

8.3 New Directions for Incorporating the Role of Skilled Practice in Narratives of the Deeper History of Inuit Culture.

In the above narrative, I have attempted to blend the archaeological framework of the past with the kayaking community’s perspective of agency and process. Although I have constructed the narrative in three sections, it is apparent that these are not discrete or static periods – events in one period spill into the next, and skilled practice patterns the structure of underlying processes. By focussing on intergenerational dynamics of the community of practice, the narrative accounts for the position of creative responsiveness in Inuit daily life over the long term. The sequence of events depends on a non-packaged version of knowledge and assumes that kayak hunting is a dynamic and impermanent skill, which changes even within the lifetime of individuals who practice it. I think that the narrative succeeds in moving beyond essentializing Inuit culture as a timeless entity that changes only through external causation; it can be seen as the beginnings of an account that incorporates Inuit agency.

However, as emphasized at the beginning, the narrative is not meant to be final and it is important to critique its limitations and propose new directions through which it can be developed further. One glaring difficulty is the centrality of kayaking. Although both genders practice kayaking in the modern community, it was primarily (though not exclusively) a male practice. By extension, a kayak-centric account of Inuit history also runs the risk of being androcentric. As a primary means of subsistence, kayaking was certainly an important skill for
Greenlandic Inuit throughout their history. Aside from hunting, kayaking incorporates many different skills and abilities such as those involved in construction and covering. However, it is far from the only skilled practice likely to have played an important role in past processes – other important skills include dog sledding, skin preparation, sewing, butchering, caribou hunting, archery, nuniaq construction, and many others. If conceptualizing kayaking as a community of practice increases our ability to understand the agency of Inuit in the deeper history of Inuit culture, then broadening the narrative to include other skills should develop this further. The process of learning any of these skills would have also played a role in the bonding of individual and social identity with environmentally situated practice, and, as with kayaking, it would have been an important aspect of how Inuit interacted with and perceived the world around them. Indeed, many traditional skills are finding renewed interest and revitalization in Inuit communities across the Arctic, opening many new opportunities for similar ethnoarchaeological research.

In conclusion, I think the most important critique that can be levelled against the above narrative, and a direction in which I hope it can be adapted in the future, is that I am the sole author. While the fieldwork was a collaborative venture that involved working very closely with kayakers to understand the dynamics of the community and their connection to Inuit heritage, I have assumed that the business of blending that perspective with re-interpreting the fragmentary archaeological record would eventually be primarily my task in writing this dissertation. However, there is a growing interest within the kayaking community towards the archaeological record. Maligiaq Johnsen Padilla, for example, has taken a keen interest in the broader history of circumpolar kayaking. For several years, he has been building regional variants of kayaks used by different Inuit groups from across the Arctic as a means of learning about their history. He has been travelling to many Arctic communities to teach kayaking workshops and now lives with his family in Alaska. Indeed, the archaeology of Greenland is undergoing an important transition, where Inuit have taken a stronger voice in the interpretation of the past. Nunatta Katersugaasivia (the Greenland National Museum) is now staffed almost completely by Greenlanders – many of whom have several decades of archaeological experience, and aside from having degrees in archaeology from around the world, also have deep cultural connection to the archaeological record they are exploring and protecting. There are growing opportunities for Greenlandic students to study archaeology. I think that very soon there will be skilled kayakers who are also
archaeologists and will contribute significantly to the way that we think about the prehistory of the Arctic and the process through which the past unfolded as a uniquely Inuit story.
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