In the Spirit of Engagement: Memories and the Sensorium in Algonquin Canoe Building

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Abstract:

This project develops cross-cultural ontologies of memory that are explored dynamically through multimodal sensory pathways. Considering the vast and varying theories on memory, the near universal adoption of storage-and-retrieval metaphors, such as the memory trace, which posits that memories are embodied 'inside' in our central nervous system or embedded 'out there' in our material environment, remains problematic. Using Material Engagement Theory (MET) as an experimental research model in cognitive archaeology, I conduct collaborative ethnographic fieldwork building birch bark canoes with the Algonquin First Nations. Together we investigate the mnemonic flow that occurs between sensing bodies and living geographies. I propose the possibility that the human mind may possess underdeveloped sensory pathways involved in the transmission of transgenerational memories and the recovery of long-lost wisdoms. I excavate the sensorium through the archaeoacoustics of forest listening to uncover the ways in which memories are deeply sedimented in the sonic worlds of nature. With the helpful concept of *mimesis,* this ethnography encourages multiple forms of listening, where natural sounds are fully canvased for what they are capable of teaching us about how to live. An examination of the haptic dimensions of the *mocataugan* (crooked knife) presents a compelling case for how material inheritances provide sensuous similarities that cohabite past and present moments of our cognitive becoming. These sensory attunements challenge the popular belief that memories are imprinted and stored. The ethnographic findings suggest ancestral memories are imminent, temporally persistent, actively participating and ready-at-hand to be enacted through our material engagements and our skillful dealings with the world. Understanding the ways traditional territory and natural resources sustain cultural memory over vast periods of time is of vital importance to the Algonquin. This research encourages us to think about how to sensibly take our place in the larger ecology of mind that sustains us and is increasingly under considerable strain.

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Fig. 1 Untitled

1. Introduction

Recent developments in the philosophy of mind and cognitive science have resulted in new sets of analytical frameworks that merit a re-examination of the interactions between people and material culture. My approach is based on Material Engagement Theory, which offers a new interdisciplinary experimental research model in cognitive archaeology for studying the dynamic connection between the brain and its material environment (Malafouris, 2013). A *material engagement* approach eschews the traditional categories of 'idealist' vs. 'materialist' to consider how cognition emerges through practical activity. MET rejects the Cartesian view of the body as

a machine that responds to external stimuli and finds the concept of an intracranialist mind and something that is separate from the physical world, unhelpful. Through the investigation of my main research question, "how do people use their senses to transform materials into complex tools?" I will challenge standard models in cognitive science, which holds that the main function of memory is for recall and repertoire.

I conduct ethnographic field research building traditional birch bark canoes with a community of First Nations in the Kichisippi Watershed on the unceded Algonquin territory. In many communities there is only the distant and fragmented memory of canoes having been built long ago. However, the Algonquin contend that, even in the absence of living memory, Indigenous ways of knowing can be recovered by going on the land or 'in-country' (*Aki* in the Nishnaabe Algonkian language) and engaging with the spirit of the forest and its raw materials in a process that connects them to their ancestors (Simpson, 2014: 7). In this research I present a cognitive ecology of birch bark canoe building that will serve as interpretive framework for thinking through the sensory ethnography as it emerges. The aim of this collaborative ethnoarchaeological research project is to develop new cross-cultural perspectives in archaeology that help to better understand how the cognitive dimensions of memory are environmentally, materially and sensorially curated. Currently, the manner in which ancestral memory takes shape over vast periods of time through the interactions between sensing bodies and living geographies remains an under-explored topic in the archaeological theory that is guiding research at the intersections of cognition and materiality.

This introductory chapter begins with a background on the origins of the ideas for this project as well as a position statement on my own background as a researcher and anthropologist in the social sciences. I then provide some parameters that outline the methods and reasons why this research is specifically designed around a Material Engagement approach and why that is

germane to the kinds of empirical testing and scholarly knowledge on memory that I pursue in this research.

1.1 Background

The ideas for this research were stimulated by my experience apprenticing to build Indigenous birch bark canoes in Canada. My attention was drawn to a couple of themes that repeatedly cropped up. First, in craftwork learning a skilled practice involves not only teaching your brain to do something but also a kind of whole-body intelligence that emerges through direct somatic interaction with the materials. This is supported in the growing area of research on apprenticeships (e.g. Billet, 2014; Marchand, 2008; Rogoff, 1990, Pellisier, 1991; Ingold, 2000). What struck me with particular saliency was the extent that Indigenous canoe builders were comfortable with the notions that learning occurred from the ground up and that materials had an agentive capacity to teach and instruct a novice craftsman in the acquisition of new skills. This would manifest, for example, when an Elder would say, “listen to the wood.” As an apprentice this was frustrating, because I wasn’t even sure what I was supposed to be listening for and I thought a much more expedient path to learning could be had if the Elder would just show me or tell me what to do. At any rate, practical skills knowledge seems, at least in part, to emerge from a liminal zone of sensory interactions listening, looking, and feeling the wood. The second theme that became apparent in Indigenous teaching frameworks is that the intellectual knowledge of how to make a canoe is grounded in the ecology of place and is not separate from the physicality and spirituality of being out on the land. In other words, knowing how to build canoes was not just an individual feat or accomplishment, it is a sacred knowledge that is shared between humans and non-human agents. This brought forth an interesting parallel with MET’s extended mind thesis and is also supported in models of traditional ecological knowledge (TEK) (e.g. Betasamosake Simpson, 2014). These ‘folk’ wisdoms began to gnaw at me, and I wondered more about the agentive powers of landscapes, the material affordances of trees, and the potential (though perhaps limited) these things might have to guide human behaviour in the

recovery of cultural practices, such as, building canoes. As Malafouris aptly points out: "Understanding how external resources matter (causally and ontologically) for memory in their own specific ways emerges as a major challenge for cognitive archaeology and for material-culture studies." (2013: 83).

1.2 Position Statement

I begin by acknowledging my position in Canada as a relative newcomer, a settler, a non-Indigenous, academically inclined, male, urbanite and I question how this upbringing has shaped my approach as a researcher studying memory and the senses among Indigenous canoe builders. I grew up in the small town of Kemptville in Leeds and Grenville County in Southwestern Ontario about an hour outside of Ottawa. Throughout my childhood, I was always very keen on making things with my hands. I found the passivity that students spent much of their day sitting, looking, and listening to teachers at the front of the classroom a little uninspiring. Scheduled periods of arts and craft provided some relief yet were separate from other subject matters that did very little to ground these lessons in practical terms or though materially lived experiences. I yearned for more time outside or in the workshop. Craftwork provided an opportunity to think through things in action and to anchor distant ideas and concepts that were not immediately obvious in the materiality of things. I can recall the moment when my interests shifted from making scale-models of trains and airplanes, like many young boys in Western culture are encouraged to do, towards hunting equipment and watercraft that belonged to First Nations. This move also coincided with a time when I was beginning to read in ethnography and archaeology and think more seriously about the ways our lives are heavily structured and shaped by material culture.

Before building birch bark canoes, I tried to make skin-on-frame kayaks. My first attempts looked more like cabinetry in the measured form of a boat. After a couple of laughable trials, I sought out apprenticeships to learn first-hand from more experienced builders. I began reading a book

published by the Alaska Native Heritage Centre, “Qayaqs & Canoes: Native ways of Knowing” (2001). Each chapter in this book tells a story about an Indigenous boat builder in Alaska. The 8 watercraft that resulted from this initiative are on display at the Alaska Native Heritage Center in Anchorage. In May 2003, I packed a knapsack and left Ottawa and hitchhiked to Alaska. I met with one of the Elders profiled in the book but plans to build a kayak with him in September later fell through. Along the way, I often slept under spruce trees, but never too far from a road or grocery store. I stopped at museums, archives, institutes, and cultural heritage centers to study ethnographic collections of kayaks and canoes. Edwin Tappan Adney’s seminal work at the turn of the 20th century on Indigenous watercraft provided a model with which to approach my own study and I began learning how to survey and illustrate and build models of Indigenous watercraft, much like Adney had done, in the same 1:5 scale. I used the computers at public libraries to email canoe builders (or authors of books about canoe building) to ask if I could meet with them. For years, I continued to pursue independent research. Though I benefitted from a fair amount of privilege, I had no personal savings or means to support my studies. There were times when I would put myself where the salmon were running, or where the blueberries or bakeapples were ripe, but for the most part I developed a capacity to live on the margins of society and slept upwards of 300 nights outside per year. Though I never owned a canoe or knew what it was like to paddle any great distance in one, hitch hiking allowed me to travel and volunteer whenever possible on various canoe building projects. Although my interest was in traditional crafts, the vast majority of the people I met and worked with over the years were non-Indigenous academically inclined craftsmen. The apprenticeships that I have participated in over the years, with Don Gardner, Eugene Arima, and, most recently, Chuck Commanda have introduced me to the wide range of networks and collaborations between diverse communities of builders of Indigenous watercraft in Canada. As a participant observer I noticed that the richness of these exchanges comes, at least in part, from the different experiences each builder brings forth, and in the complimentary approaches and multi-cultural ways the body performs and remembers its skills.

Eventually, I returned to school and enrolled at university in anthropology. Although the discipline of anthropology has a highly theoretical orientation, I was able to find traction for canoe building, not just as fieldwork, but as research creation. Making a birch bark canoe as research creation challenges hierarchies of knowledge that conform to the standard academic genre of an analytic dissertation or essay. But I also did not want to sidestep the materiality of lived experience and to allow canoe building to be used as merely a site of academic investigation. I am interested in research that takes on multimodal forms that can be understood in their own context without necessarily translating it or answering to the terms of a dominant Western discourse and inquiry. This combined research practice of sensory ethnography and research creation has taught me about the changing ecologies of the forests that have constituted the memories and lifeways of Indigenous canoe builders for millennia; and about the colonial landscape that all builders, both Indigenous and non-Indigenous, inhabit.

1.3 Notes on Methods and Research Praxis

In the application of Material Engagement Theory (MET), this project features research creation and sensory ethnography in Indigenous canoe building as the primary methods of inquiry and mode of empirical testing. Academic inquiry has long privileged abstract knowledge by creating cognitive schemata of understanding, which are primarily transmitted through language. Given that we also understand the world through all our sensory modes and bodily participation, sensory ethnography and research creation offer a unique opportunity to study the multimodal ways that a situated body remembers and performs its skills. Research creation is germane to the recovery of ways of remembering and encourages us to trust what we have come to know through our sensorial experiences while interacting directly with natural materials in forest environments. Research-creation also points the way forward towards pluralizing what counts as knowledge at university to include skilled performances and the production of cultural artefacts.

This study addresses alternatives to the established primacy of theoretical knowledge by engaging in a pragmatic approach, which seeks to recover the value of skilled apprenticeships in higher education for their ability to connect "theories of knowing to practical doing." (Marchand, 2008: 246). The premise being: that skilled practices have become increasingly marginalized in academia and concepts, which are abstracted above the usefulness of everyday life, are overvalued in contemporary education. In repudiating the categorical tidiness of dialectical models that entrench Western epistemology, (notwithstanding Platonic idealism of separation of mind and body), it is herein argued that experiential learning, which prioritizes somatic interactions with materials situated in landscapes is an equally hard-earned, cognitive, intellectual, and mnemonic achievement.

In anthropology and among embodiment scholars, Merleau-Ponty is often regarded as a pioneer. In his theory about the unity of consciousness and action, he states that all knowledge is embodied and that all thinking is born out of sensuous engagement in the world (1962: 229). One of the guiding principles of embodied knowledge is that consciousness is also a matter of doing, not only of thinking (Merleau-Ponty, 1962: 124). In contrast to ideational models of intelligence, embodied knowledge emerges in a field of total corporal experience where there is no *a priori* hierarchy of mind over body, as they are mutually and indivisibly responsible for actions of higher-order cognitive functioning.

Where apprenticeships are concerned, we may draw from Peters, who says 'the history of Western education has too narrowly focused on conceptual thinking (2008). Marchand urges us to adopt apprenticeships in higher-education for their potential as "expanded notion of knowledge that exceeds propositional thinking and language and centrally includes the body and skilled performance" (2008: 245). However, a shift towards apprenticeships within a program of research creation at university would be severely undermined if it were subsumed into becoming the object of our research (i.e. to study how learning occurs in practical contexts), or constrained

merely as another method of inquiry (i.e. used as a complementary means of data collection). This would do little to disrupt the canonical practices already espoused in academia, since anthropologists have long participated in the exchange of work to gain first-hand participant knowledge to be used as data-points and the contents of their writings.[1]

This problem in research creation is articulated by Chapman & Sawchuk (2012) who are careful to make the distinction between "research-from-creation", which is where creative works are used to generate information, and "creation-as-research", which is more controversial and encompassing the communication of mind-set and practice through the direct deployment of creative processes. In the latter case the "results" of the research are presented in alternative format, which go quite a ways further to disrupt the "regime of truth" by challenging "the argumentative form(s) that have typified much academic scholarship" (ibid: 6). Therefore, what I am proposing is that Indigenous knowledge about how to harvest bark in the forest and how to build canoes be considered in its own right and by its own merit part of the package in the contribution to scholarly research. Thus here, and in so doing, the scholarship of canoe apprenticeships requires a shift from the standard recognizable academic genre of print media towards the production of multimodal expressions of knowledge that take on material forms other than an essay about the process.

The call for non-textual outputs or productions of knowledge in academia is not new. Michael Taussig wondered if "anthropology has sold itself short in conforming to the idea that its main vehicle of expression is an academic book or journal article" (2015: 76). However, moving anthropology beyond textual accounts is not just the literary question it initially appears to be. Cox says that, "non-textual [works] […] have the capacity to offer anthropological insights of equivalent value to the standards set by the written text" (2014: 9) –Something, which visual

[1] [For apprenticeship learning] see: Barbara Rogoff, *Apprenticeship in Thinking: Cognitive Development in Social Context*. (New York, NY: Oxford University Press, 1990). [For apprenticeship as field method] see: Coy, M. W. *Apprenticeship: from Theory to Method and Back Again* (Albany, NY: Suny Press, 1989).

anthropologists have been advocating with the inclusion of ethnographic film (e.g. Pink, 2007, 2015). Proponents of non-textual media in anthropology are often mistaken for having a naïve or romantic antagonism towards writing as if somehow alternative media can "obviate the obscurantism of specialised academic language" (Cox, 2014: 11). But non-textual works in anthropology are not meant to replace textual accounts. The real argument for the inclusion of alternate media is not to be entirely liberated from text but rather to encourage the scholarly development of knowledge in a combination of diverse media, which offer the potential to overcome some of the limitations of print.

When discussing the phenomenology of sensory ethnography, Howes states "the researcher is continually at risk of projecting their own (culturally biased) subjective experience onto the culture under study without even being the wiser, whereas the trick, of course is to exercise one's senses critically (Cox et al. 2016) and reflexively (Howes 2003; 10-17, 28) in an effort to make sense of how the sensorium is constructed and lived locally" (2019: 23) This aim is best served by adopting a cultural historical approach (Classen 1993; Smith 2007; Howes & Classen 2014) (see also Geurts 2003; 15-16, on cultural phenomenology and bodily ways of knowing). Therefore, when employing a methodological framework of MET and anthropology of the senses, it is crucial to continually be reflexive about one's own sensory constitution and cultural biases, including the hierarchies of the senses. Furthermore, As Regina Bendix points out, to research 'sensory perception and reception' requires methods that 'are capable of grasping "the most profound type of knowledge [which] is not spoken of at all and thus inaccessible to ethnographic observation or interview." (2000: 41). As Howes pointed out earlier, the "verbo-centric" approach of dialogical anthropology was limited as it failed to account for the senses (1991: 7-8).

Similarly, the impetus to the importance of Material Engagement and the practice of a skilled craft at university is illustrated with the example of the potter given by Malafouris. He says, "No one – not even the potter himself – can have access to this type of information […] Potters know

more than what they can tell or explain and their hands often have reasons of which their mind is not aware and which the clay may resist or accommodate. Verbal descriptions, however detailed, can hardly capture the phenomenological perturbations of real activity and the reciprocity between the crafted and the crafter" (2008: 21). This points to the problem that skills knowledge potentially defies analysis because an element of it remains obscure and consciously inaccessible both to the skilled practitioner and to the observer alike. Connerton refers to a kind of "remembrance in the hands" where the know-how of practical skills is "sedimented, or amassed, in the body" and "acquired in such a way as not to require explicit reflection on their performance" (1989: 72, 102). In other words, there's a dimension of embodied knowledge that operates on a level that escapes reflexivity, declarative language, and autobiographical memory, which after all depend more on one's proficiency in exercising discursive practices to narrate episodes of content from their personal past. While this points to the limitations of autoethnography and ethnographic interviewing, it brings further methodological traction to diversify our modes of inquiry with the inclusion of apprenticeships. This would allow for the material manifestations of embodied knowledge and the skilled production of artefacts, not as merely physical evidence of our advanced knowledge systems, but rather the emergences upon which abstract systems are then elaborated. This is further supported by Malafouris (2004, 2008, 2013); Sutton (2008); and Marchand (2008, 2010).

Multi-modal expressions of knowledge bring about new considerations that are far from unproblematic. For instance, by beginning this paper with a preliminary sketch of literature, which situates an argument for the inclusion of apprenticeships and the craft knowledge of canoe building at the post-secondary level, it would appear that I've tentatively established a hierarchy that is contrary to the whole premise of my commitment to eschew the dualism of mind and body and by extension of declarative knowledge over perceptuomotor activity. Yet what is different here and with material engagement theory is that theoretical implications are not cut off from embodied practices. Reason is not separate from embodiment, on the contrary the two are mutually entangled and indissoluble. In the order of operations none of my own ideas or

manuscripts were articulated or took shape separately from a ground-up approach and the direct immersive and experiential context of building canoes.

With research creation the new reality is that increasingly scholarly circles have been making provisions, which could be mobilized by students to express higher orders of learning and cognitive faculties through the diverse cultural practices and skilled actualization of creative works. Yet the skilful production of artefacts as part of a curricula within the colonial structures of a state sponsored education system is not a perfect solution, far from it. I acknowledge this is fraught with a layer of power asymmetries that is highly unjust. Betasamosake Simpson articulates this best when she says: 'state-run schools are still considered as the "colonizer's education system" and they assist the government in taking native children away from their homeland to be educated in learning spaces and according to learning objectives that do not respect the values of our community (2014: 22-23). But what if we insist on a path to teaching that includes Indigenous frameworks? The knowledge of canoe building will always crucially remain grounded in the ecology of place, which is inseparable from the physicality of being out on the land. Precisely what is so precious about this practice is that, as with any kind of skilled craftwork, the memory of how it is performed partly resists being captured by the written word, and thus must be kept alive with our continued material engagements. Cultural narratives, though potentially powerful and far-reaching, provide scant substitute for the kinds of knowledge that belongs among people who develop a particular set of skills by actually living and moving with the land. What the craft of writing does allow is for us to share our private thoughts with the greater public. Whether it be through apprenticeship or research creation or a number of other modes of expression, my hope with this participatory community research is that our success as scholars and practitioners of anthropology may also be measure by our pragmatic effects in the world. In this sense every birch bark canoe that is built for children to paddle and every story that is generated for grandchildren to read is no small victory.

While apprenticing to build canoes there is a reconfiguration of conventional relationships between people, animals, materials, and landscapes that occurs that is capable of throwing other issues into sharp relief. Research-creation not only provides a solid opportunity to hone practical skills while laying the foundations for further intellectual pursuits, it can also rescue the experience of a formal education from the grips of interminable theoretical abstraction, overemphasis on literary achievement and sensorially sterile learning environments. As Howes & Classen remark: "In the modern classroom, the ability to remain still for long periods of time solely looking and listening is a prerequisite for academic success. In cultures in which education is a more active process involving all of the senses and bodily movement, looking and listening would only be one part of the educational process" (2014: 2).

Furthermore, this doctoral thesis will advance the applications of Material Engagement Theory and is a direct response to Howes (2001, 2003), Ingold (2012), and Malafouris' (2015) respective challenge to consider further research that; 1) cultivates human corporeal experiences by learning to recognize significant differences in 'ways of sensing' across cultures; 2) takes more seriously our interactions with metaphysical forces; and 3) prioritizes process in a theoretically engaged archaeology. Rethinking the ways humans engage with the material world is crucial to present-day concerns because increasingly memories are being diverted from the diverse sensory experiences that come directly from the land, into more mediated worlds, which can be narrowing for Indigenous culture that relies on learning through the body in environmentally situated practices. Making canoes necessitates finding out about the individual characteristics of trees, materials, and arguably other living organisms that inhabit the woods, which are all of great concern and crucial to understanding aspects of bodily memory that has been little theorized or understood. It requires developing your senses and trusting what you have come to know through your body as it is immersed in the grittiness of everyday life. Engaging with natural materials on the same terrain where generations of canoe builders have walked before is a highly effective way to experience first-hand the vital roles materials have in transmitting cultural memory. Being alive in the woods gives the humbling sense that people are but one component

of the diverse ecology of multiple actors, both human and non-human that are involved in the dynamic processes which sustains generations of cultural memories of canoe building.

1.4 Guiding research questions

1. What forms of cognitive coupling occur with environmental resources to support memory?
2. What role does material agency have in transmitting cultural memory among skilled practitioners?
3. How do people use their senses to transform materials into complex tools?

1.5 Structure of this Thesis

The first half familiarizes readers with the problems that arise with theories on memory in the cognitive science. I discuss 4E cognition, with a particular in-depth look at embodied and enactive cognition, (and to a somewhat lesser extent the embedded and extended mind thesis). I take time in this first section I to explain how a Material Engagement approach is better suited to understanding complicated dimensions of cognition, like memory, and bridges certain shortcomings within the cognitive sciences and philosophies of mind. In chapter 3, I provide a historical context for how the Algonquin have been cognitively colonized and have been forced to the margins of their own territory. This is supported with an ethnographic vignette about the challenges of harvesting bark in colonial landscapes and a discussion about how spatial geography and traditional territory are vital to Algonquin ontology. In the second half I move away from the deserved critique of occularcentrism in anthropology and I explore the two most relevant sensory modalities to a canoe builder – that of listening and touch. These

anthropological investigations provide substantiative evidence for understanding memory and expands upon the applications of Material Engagement Theory that I've laid out in the first half.

1.6 Research in the Making

Three canoes were crafted as part of this research. Each canoe required approximately one week to harvest and prepare the materials and then a further two to three weeks of teamwork for assembly and construction. The first canoe was built in Smith Falls at the District Collegiate Institute in October 2017. The next was at Sacred Heart Secondary School in Stittsville in June 2018. Both projects were integrated into the curriculum for high school students as part of the Ontario Ministry of Education's Indigenous Education Strategy. A third canoe was built at Murphy's Point Provincial Park in July 2018 for reconciliation acknowledging that parks lands are on unceded Algonquin territory. During the workshops students and members of the public were encouraged, (but not required) to participate. At the end of the construction there was a launch ceremony where the students could celebrate their success and feel what it is like to paddle on the lake in something they made with their own hands.

Fig. 2. Finished Canoe at Murphy's Point Provincial Park

Fig. 3. Will splitting spruce root

Fig. 4. Tyson sewing bark panels

Fig. 5. Trinity lashing thwarts to the gunwales

Fig. 6. Chuck splitting cedar sheathing

Fig. 7. Marina carving cedar ribs

Fig. 8. Chuck and Kathy installing ribs

Fig. 9. Vincent boiling spruce sap

Fig. 10. Canoe Launch Ceremony at Sacred Heart School

Though my research involves multimodal forms of knowledge I am constrained in the writing of this dissertation by the two-dimensional page. I include photos and links to audio recordings and short video clips to bring these textured accounts to life whenever possible. However, as my methodology on research creation alluded some of the multimodal knowledge escapes being expressed or captured in dialogical form and by the very nature of memory, resists being stored or captured by recording devices. Part of the success here, is that the canoe is physical manifestation of the valuable skills the participants learned and the people who participated in this research are now a part of the mnemonic flow that arises from the deeply entangled relationships between people and rivers and trees since time immemorable.

Chapter 2

Charting a functional guide to memory theory with MET

2.1 Introduction

In this chapter I explore the ways the mind remembers through three main areas of scholarly research: 4E cognition, (with particular focus on embodied and enactive cognition), materiality, and sensory perception. I begin each section with a brief explanation of how an intracranialist model has constrained our theoretical approach to research. The sections are then developed to show how Material Engagement Theory (MET) can enhance our analysis of cognition, when, for example, extended resources are taken to be constitutive of mind, when materials are considered to have agency, and when multisensory perception through an anthropology of the senses is brought more prominently into the archaeological fold. I have chosen to organize this chapter in a such a way that maps onto each of the research questions I've set out to answer in my thesis. This chapter, thus, provides the basis for where I intend to focus my attention during the ethnographic fieldwork. Unlike the organizational structure of writing, the intricacies and complexities of cognition involved in the act of remembering do not lend themselves well to being divided up neatly into categories. But it is through these separate, yet related bodies of literature that I invite readers to explore the possibilities for thinking about ecological approaches to cognition and what this implies for Indigenous canoe builders to recover lost cultural practices by engaging with the materials of the forests on their traditional homelands.

Procedural memory or skills memory, which features prominently in my research, is activated seamlessly and simultaneously with several other types of memory to accomplish perceptuo-motor tasks. In psychology, researchers discuss hundreds of types of distinct memory systems, which tend to be grouped into either declarative or non-declarative forms of memory (Michaelian, 2016). Procedural memory is the kind of remembering that encompasses the vast majority of what humans do in everyday life. It is, for example, the skilled knowledge of how to walk, how to reach and grasp to open a door, how to chop firewood or how to ride a bicycle.

Procedural memory is what enables us to perform motor tasks without having to learn from scratch over again each time. Yet it is never the fixed deployment of a rigid task sequence, it always remains sensitive to the current context and relies on sensory perception and the constant shifting of our attention to make judgements and subtle recalibrations that allow us to adapt to the novel circumstances within the environment (Hutto & Myin, 2017: 204; D. Sutton, 2006: 91). Procedural memory is different from declarative memory, which serves for the recall of facts or events. Declarative memory can be further broken down into episodic memory (sometimes also called autobiographical memory), which is for remembering life's ongoing experiences and semantic memory, which supports the acquisition of general factual knowledge (Tulving & Markowitsch, 1998). Though this is still highly debated, a distinguishing feature of procedural memory is that it is performed unconsciously and is not based on internal repertoires or mental templates of how to act in a particular situation (Schacter & Tulving, 1994: 26).

Since procedural memory involves the actions of a situated body it is thus well described within the literature in the embodied branch of cognitive science (Hutto & Myin, 2017; J. Sutton and Williamson, 2014). As such, I begin to chart this course through cognitive theory with a short primer on embodied cognition. Following this, I compare both representational and contentless models of cognition and review the conceptual frameworks that deal with the ways in which the mind exploits its material surroundings to assist with the cognitive task of remembering. This aspect, often referred to as cognitive *offloading* will be a key concept for thinking about how the Algonquin recover long-lost cultural practices. In the second section I take an in-depth look at enactive cognition and the problem of the ubiquitous memory trace. I use MET to offer a more likely alternative to the conventional trope which take the mind as being a physiological substrate upon which memory traces are inscribed. Instead, I offer a way to think about memory as something that only exists in execution while *doing* something. In the third section, given that objects play a crucial, reciprocal and constitutive role in mnemonic processes, I introduce the topic of material agency (Malafouris, 2008, 2013). I begin with an outline of the philosophical debates about intentionality, causation and action, which form the crux of the argument for the agentive qualities of materials. Then I conclude with a discussion about the implications material

agency presents for human memory. One of the problems is that with non-declarative skills memory remains curiously obscure and consciously inaccessible. I suggest that ethnographic apprenticeship provides a suitable mode of inquiry that allows for the study of our pragmatic effects with materials, and where the process of remembering is revealed through praxis. In the last section, on sensory archaeology, I discuss Western sensorial regimes, which have limited the scope of our observation and analytical efforts in empirical research. The sensory turn in archaeology has given rise to various multi-sensorial, multi-temporal and cross-modal analytical frameworks and interpretations. This highlights the importance of exploring the roles that materials have in giving meaning to the sensorial texture of perception, which is also key to understanding how memory is intimately entangled and interwoven in synaesthetic experience. This comprehensive course through the relevant theories in cognitive sciences and memory theories sketches an approach towards archaeological research that brings the best of the relevant fields of 4E cognition, materiality and sensoriality to our understanding of the mnemonic process.

2.2 A brief overview of embodied cognition

Embodied cognition is founded upon the premise that the body's sensorimotor interactions with the world are deeply coupled and integral in the structural workings of the mind (Chemero, 2011; Gallagher, 2005; Wilson, 2002). The origins of the embodied branch in cognitive science trace their way back to William James' (1890) ideomotor theories of action; Jean Piaget's stages of childhood development; and J.J. Gibson's (1966, 1969) ecological approach to psychology. Embodied cognition is understood to emerge through action and movement and to be intertwined in the relations between bodies, materials, and the environment (see also: Bateson, 1972).

According to Shapiro (2011), three general themes emerge among embodiment theorists. 1) *Conceptualization* is where the concepts an organism can acquire are limited by the kind of body (and sensory apparatus) it has. 2) *Replacement* where models of cognition that posit the brain is for computing and storing internal representations of the external world, are better off replaced by empirical studies that pay particular attention to how organisms move about and interact with their environment. And 3) *Constitution,* which explains that cognition is not just causally dependent on the perceptual and motor capacities of the body, but moreover that these sensorimotor interactions are also the very structure that the mind is composed of. (Shapiro, 2011; see also, Rowlands 2010). Though embodied cognitive theory has made explicit its concern with the problem of symbol-grounding in mental representations (Robbins & Ayeded, 2009); research that falls under the theme of replacement can also be seen as part of a broader movement in psychology, philosophy, and anthropology that challenges intracranialist (internal brain-bound) computational and representational theories of mind. From the perspective of embodied cognition, 'the mind' is considered to extend into the extra-neural body, and possibly beyond the skin into the extra-somatic environment. The lumping and splitting of representationalists vs. anti-representationalists is one of the first major schisms on the road to beginning to map various branches and philosophical underpinnings in cognitive science.

2.3 Memory and embodied cognition

The debate about the (in)existence of mental representations isn't as interesting on its own, as are some of the ensuing ramifications it has for our understanding of how people use memory. Take for example this intracranialist model of cognition, which makes the following claim about how invention may have occurred in the Palaeolithic era. According to de Beaune, invention resulted from a combination of two kinds of action, either by deploying a familiar action with a tool that is normally used for another purpose, or by using a familiar tool to work a new material (de Beaune, 2000, 2004, 2008). In either case, the use of analogy, it is argued, is what enabled

early hominids to apply a familiar action to a novel situation by "drawing on two types of mental representations: those stocked in the long-term memory, and transitory representations, meaning those used during information treatment that correspond to the working memory, […]" (de Beaune 2009). Here the suggestion is that early hominids must have had the ability to use analogical reasoning as well as dual modes of mnemonics.[2] But what is being described is a scenario where working memory is being summoned by a need to act that in turn provides a schematic of how to proceed from an internal inventory of mental representations. This undermines the possibility that the 'how to act' occurs at the bleeding edge of sensation interacting directly with the material world. In effect it offers a model of memory that assumes by-and-large we are constantly checking back in with the command post in our brains drawing wholesale upon a repertoire of previously catalogued experiences.

Models of cognition, which uphold mental representations have served well to isolate the mysterious workings of the mind so that closer attention can be paid to the physical properties of materials and the technological sequences involved with how these are shaped into tools. This is apparent in Leroi-Gourhan's (1993) work on *chaine-opératoire*, which recognized the importance of dynamics between gestures and materials, yet still maintains the idea of a mental template of form being transposed onto the raw materials. This can also be seen in Lemonnier's (1993) and Pelegrin's (1993) work, even though the latter acknowledges that the notion of an ideal form is problematic, he inescapably returns with the distinction of conceptual knowledge *connaissance* and practical know-how *savoir-faire* (see Conneller, 2011; Walls 2016). This Cartesian division between mind and body (as well as mind over matter) persists in computational and representational models of cognition such as those elaborated by Wynn and Coolidge (2011) on declarative memory and procedural motor skills.

[2] Long and short term memory (or "working memory") is somewhat of a naturalized concept having first been suggested in 1883 by Francis Galton, further cemented by Broadbent's work in 1958 and then later with the appearance of "working memory" by Baddeley in 1986.

Embodied cognitive theory casts doubt about representational models and about the possibility that procedural skills are based on declarative memory. Brooks introduces the problem of "representational bottleneck" (1991). He describes a situation where an agent (in this case a robot) is sensing information about its surroundings to make decisions about how to move and complete a task. A situated cognizer, it is argued, must not be using internal mental representations because the demands of 'real-time' interaction, especially in conditions where either the environment is changing rapidly, or the need to act is under time pressure, (or both) are too expensive for the cognitive architecture, and thus cause a processing bottleneck (Brooks, 1991). With human agents, this bottlenecking phenomenon is also observable and we often fall apart and fail when the task becomes too demanding and/or cannot be completed in time. This isn't proof that we operate on representational models, actually just the opposite. Instead, Brooks (1991) argues this points to the possibility that human cognition may have found a cheaper and more efficient way to make time-sensitive, situation-appropriate actions without having to deal with the slow and cumbersome calculations of mental representations. As Andy Clark put it, why should we go to the trouble of modelling the world when we can just use the world as its own best model (1997). Ecological and phenomenological approaches to the material dimensions of perception and cognition attempt to dissolve these dualisms. This has far-reaching implications for procedural memory because the strategies for a more efficient way of knowing how to act are either by 1) going *offline* or 2) *off-loading* the heavy cognitive work onto the environment (Wilson, 2002). This twin feat brings us away from intracranialist memory that is brain-bound and incramentally closer to thinking about the constitutive role landscapes and materials have on extended memory in ways that are helpful for the present research, and this will need to be teased apart further.

2.31 Offline Cognition

Everyday perceptuomotor activities like walking or reaching for a cup of tea, to more skilled movements like those required to do carpentry or play a musical instrument; are considered to be on-line because they necessitate the continuous and reciprocal sensorimotor feedback to take place in-situ while time-locked and actively engaged in a task. In these types of tasks, Connerton refers to non-declarative skills memory as habits of memories, which are "acquired in such a way as not to require explicit reflection on their performance" (1989: 102). Playing music is thus described as an embodied "remembrance in the hands" (1989: 93).

In contrast, *offline* cognition refers to the ability to retreat, reflect, sit back, observe, think about, plan, and only then, if so desired, take action (Wilson 2002). Because *offline* cognition can occur simultaneously in the midst of online streams of cognition, Clark prefers to use the term "surrogate situations" where we are able to deploy stand-in perception and action routines that are removed from the objects they are concerned with (Clark, 2005).[3] Clark says people actually go to quite a bit of effort to avoid using environmentally detached (*coupling-resistant*) reflection by using complementary surrogates (*coupling-friendly)* such as drawings, plans, calculations, prototypes, or storyboards, which help ground our *off-line* cognition back in real-world sensorimotor-based cognitive routines to assist us with what is otherwise 'elusive, absent or distal' (2010a, 24).[4] Furthermore, while *offline* cognition may appear to not have direct bodily involvement, it is still fundamentally bodily based on sensorimotor imagery with a potential for action (Robbins & Aydede, 2009: 4-5). Clark's concept of complementary surrogates is a potentially helpful tool for recovering extended cultural memory because it suggests that people

[3] The terminology of *offline / online* is a bit contentious because cognition is never really disengaged from the ongoing events in life. What is meant by offline is an analogy for a strategic work-around for coping with the temporal constraints of cognitive load processing – thus why Clark suggests the term 'surrogate.'

[4] In Clark's chapter "Material Surrogacy and the Supernatural" he uses the example of religious and spiritual beliefs being largely 'offline' and decoupled (or coupling resistant). He says: "The need for situational surrogacy increases with the sensory ineffability and coupling-resistance of the target" (2010a: 25). As Day elaborates, religious artefacts make tangible machinery anchoring the realm of invisible (offline) with real-world structures (M. Day, 2004: 101-102).

engage with objects, for example through scale-drawings and models to help think through perceptuo-motor sequences that are not immediately obvious or accessible.

It is easy to note the similarities between *offline* cognition and episodic memory. Where *offline* cognition allows us to retreat, reflect and think about how to act, episodic memory allows us to "revisit specific episodes or events from the personal past" (Michaelian, 2016: 5) and to engage in "recreative or simulative imagining" allowing us to (re)construct and entertain foreseeable outcomes (Hutto & Myin, 2017: 217; see also Gerrans & Kennett, 2010). This leads Hutto & Myin to claim: "there is no intrinsic difference between [episodic] remembering and imagining" (2017: 217). Except of course when there *is* a fundamental difference as Schacter et al. points out: "remembered events *must* refer to the past" whereas "imagined events" could just as well refer to the future, the past, or the present. (2012: 678 emphasis added). But Michaelian still insists: "to remember, it turns out, is just to imagine the past" (2016: 14). In its pure form episodic memory need not be declarative or based on explicit representations of the past. It can simply be simulative imagination. De Brigard's opinion is that when we set our minds to the task of remembering, we at least use our imagination to generate plausible events that are potentially constrained to dealing with the situation at hand (2014b: 178-179).

The theory that there is a cognitive relation between memory and imagination underscores that memory is as much a reconstructive process as it is a creative one (Schacter et al., 2012: 681).[5] Episodic memory is compared to being a kind of mental time travel, (Suddendorf & Corballis, 2007; Michaelian, 2016) that "extends our cognitive contact with the world beyond the here and now of perception" (Hutto & Myin, 2017: 222). This memory phenomenon has also been called "chronesthesia" –the capacity to be aware of subjective time (Tulving, 2002). This highlights the need for an integrative theory of *offline* cognition and episodic memory that is faithful to the fidelity of the signal of past happenings (ie: that is not purely imagined misremeberings) and that

[5] The link between remembering the past and imagining the future is also made in psychology, which observes shared and overlapping neural activity on magnetic resonance imaging (see: Addis et al., 2007) and in behavioural studies, which document a correlation between the ability (or inaptitude) to remember and imagining future events (see: Szpunar et al. 2007).

can assist in grounding simulated surrogates in the present with actual distal procedural memories of the past. [6]

2.32 Cognitive offloading onto the environment

There are number of ways the mind can reduce mental gymnastics and operate more efficiently. As mentioned before one of these ways is by offloading difficult cognitive tasks onto the environment. This next subsection will review the literature on memory as it pertains to three prevalent mechanisms for offloading cognition: passive dynamics, the archival method, and epistemic actions. But first, a small order of housekeeping is needed. Once cognition is considered to go beyond the bounds of the skin, - as is the case with the present discussions about offloading the cognitive task of memory onto the environment, - it begins to straddle related theoretical approaches that deal with an embodied mind in an embedded world. For this reason, in the following section, it will be helpful to draw on literature from extended, enactive, and distributed cognition. These theoretical frameworks are not necessarily unified, but they are compatible in the sense that they generally regard any attempt to artificially divide and define cognition as an internal process that is separate from our interactions with the outside world, as highly problematic.

An embedded theory of mind explains how cognitive systems lean heavily on their environment without the need to internalize it. Herbert Simon (1969) gives the example of an ant making its way up a sandy wind and wave swept beach. As it laboriously navigates an irregular path

[6] One problem with episodic memory as described in the literature is only for the recollection of personal past events. When memory is said to recall facts and events of a general nature it is referred to as semantic memory. In the context of the present study, we are dealing with the spanning of generations where there is no living memory. To transcend the personal and recover ancestral memories thus becomes a problem that is not solved with *offline* forms of episodic memory. I acknowledge this shortcoming and include a footnote here to call attention to this. The discussion about Clark's surrogate situations is meant to be helpful to consider how surrogate practice of physically making canoes in the present could assist as working model in creating the active conditions for remembering the past. Harnessing material surrogacy with *offline* cognition as a process of creative, imagined, and reconstructive remembering could theoretically allow for a concept of mind that time travels to places of distant ancestral recollections.

detouring around pebbles and steep dunelets, he says, much of the complexity we observe in the decisions the ant is making are actually external to the agent and "largely a reflection of the complexity of the environment, in which it finds itself." (1969: 52). Although Simon did not have the benefit of working with the extended cognition theories that are available today, he probably thought of the ants' navigation and path integration behaviour in the Skinnerian conception of stimulus-response cycles. Nonetheless Simon provides an easy analogy that is helpful for thinking about how cognition may be embedded into the environment.

2.321 Passive dynamics

Passive dynamics makes optimal use of external resources in the environment to share information and distribute energy across the entire brain-body-environment cognitive system more efficiently, rather than relying entirely on internal resources (Clark, 2008; Shapiro 2011). The environment is already rich with affordances that help guide our behaviours. To illustrate how our bodies are arguably already intelligent by design, Chemero uses the example of the kneecap, which limits the motion of our legs and helps make balance and locomotion easier. He says "it is only a small exaggeration to say that learning to walk is easy for humans because our legs already know how" (2011: 27). The slinky toy is a prime example of passive dynamics in action because of its ability to move down a set of stairs without any complex inner workings or internal energy supply simply by harnessing the external forces of gravity and friction. A slinky is not particularly 'intelligent' and it doesn't know how to go down stairs from prior learning, but it is by virtue of mechanical design able to deploy a particular behavioural sequence once its potential energy, which is distributed across the slinky-stairs system, is pushed into motion and activated. Humans have similar yet slightly more sophisticated strategies to manipulate and alter the environment to our advantage through the use of what's called *epistemic actions.*

2.322 The archival method

Before getting into the thickets of what *epistemic* actions are, there is another technique of cognitive offloading that I will address first. It is known as the archival method, where things in the environment stand-in for, and allow us to avoid the heavy work of memorization. The most obvious examples of this are the use of certain objects, like pencil and paper, or computer and hard-drive, to ease the task of having to remember.[7] Unfortunately, Wilson stops here and says: "Although the archival case certainly constitutes off-loading, it appears to be of less theoretical interest. The observation that we use such a strategy does not seem to challenge or shed light on existing theories of cognition" (2002: 629). For embodied theorists perhaps this is true, however, in moving beyond an embodied perspective, to a distributed approach using Material Engagement Theory, Malafouris is more productive in getting at how memory emerges through the materiality of things. For example, the Linear B clay tablet is not just an external memory device to lighten the cognitive load of the Mycenaean mind. Taken as such, it would only serve to increase the dichotomy of inner and outer boundaries we initially set out to challenge. Instead, the Linear B tablet and Mycenaean scribe (and anyone else who comes along afterwards to read it) is 'part of the process by which the whole system remembers' (Malafouris, 2013: 82). Here memory could be seen as distributed across the whole cognitive assemblage and emerges from dynamic interactions with the tablets. However, there are some key differences between MET and distributed cognition that I will take a moment to explain.

Distributed models are inspired by the work of Donald Hebb (1949) who proposed that memory was based on connections formed through networks of nerve pathways linking together various nodes. New connectionism, and the rise in popularity of interdisciplinary approaches to

[7] Physical features in a natural or altered landscape can also prompt memory in a more automatic, and indirect way. For instance, when we navigate our way home, we do not need to remember every turn or step along the route, or when we see a familiar face in a crowd we haven't scanned and taken in the entire crowd to know we've just spotted an old friend. This involves what is called "repetition priming" (Glenberg, 1997; Roediger 1990).

cognition, such as the Parallel Distributed Processing (PDP) model, posited that mental phenomenon were a series of interconnected networks rather than discreet systems. Early distributed approaches looked for groups of models that could explain the underlying structures of neurophysiological processing principles. The guiding questions in early distributed approach to memory were to uncover "how information is represented and of what kinds of processes operate on this information have formed the focal point of most of the theories of long-term memory." (Rumelhart & Norman, 1981: 1) The hope was since a distributed processing model did not require central executive control in cognitive functioning that these new types of memory systems could "offer an alternative to the "spatial" metaphor of memory storage and retrieval" (*ibid.*: 2).

More recent distributed models of memory are elaborated by Edward Hutchins' (1995) paper on *How a cockpit remembers its speed*. Here the emphasis is on the dynamic relationships among people and flight systems in airplanes where memory emerges through a series of mutually patterned action coordination. In this model the whole system is said to be self-propagating thus, providing the basic conditions for which memory is shared (Hutchins & Klausen, 1994). While this treatment of memory focuses on how cognition emerges among various actors, it still presumes the system, both human and technological, comes pre-loaded with certain speed processing abilities. A distributed approach appears to lean towards an anti-representational view of memory where "neither the information nor the sequence of actions to be remembered need be explicitly represented anywhere" (Sutton, 2008: 45). But Hutchins is still caught up with "propagations of representational states" … "both inside and outside the individuals across various media" (1995: 14-16). As Malafouris explains: "[Hutchins'] distributed cognition remains a distributed computational system […] one could question both the centrality of representation and the centrality of information processing as tools for thinking about thinking" (2019: 7). Distributed models also include various accounts of social memory such as Barnier & Sutton, (2008) but they too are struck with a model of cognition that views it as central processor with how "groups operate to process information" in a scaffolded manner (177).

A MET approach is much less concerned with localization and artificial categories of boundaries, or even the representational content of the tablets as an external storage device, instead MET treats the mental and physical realms as potentially indistinguishable within an entire emergent process that is about remembering (Malafouris, 2013: 85). From this perspective the Linear B tablet also evades the disembodied disengaged analysis of conventional Saussurian linguistic semiotic accounts of materiality and allows for other angles of material semiosis to be revealed. The Linear B tablets, Malafouris says, becomes an entirely different and "extended way of reorganizing the Mycenaean cognitive system" (2013: 81). As long as you can read it, (which implies both literacy and literally being able to get your hands and eyes on the tablets) then it also presents an entirely new way of remembering and forgetting. It allows for Mycenaean cognition to transform what is a limited biological memory problem into an easier problem of recollection using perception and skill. The tablets can be rummaged, edited, amended, and destroyed in ways that biological memory cannot afford. It circumvents the leaky and forgetful domain of brain-bound semantic memory and substitutes it with a new visual-tactile system of recognition. This is where MET excels. It eschews locationality by not reducing memory to its constitutive parts of person or thing and internal or external and it brings about a "new ecology of memory" that emerges between the ensemble of materially mediated engagements (Malafouris, 2013).

2.323 Epistemic actions & epistemic artefacts

Now I will return to discuss *epistemic* actions as a means of offloading cognitive tasks onto the environment. Epistemic actions are physical actions whose purpose goes beyond merely advancing towards a goal; instead, these kinds of actions alter or manipulate the environment to ease, improve, optimize, or alleviate cognitive load (Kirsh and Maglio, 1994). A simple example of this would be the action of placing our keys in our shoe to remind us to bring the keys and lock the door on our way out. The action of placing the keys in the shoe doesn't necessarily bring us any closer to the goal of locking the door, in fact it's an extra step, but its purpose is a deliberate

cognitive strategy to ease the job of having to remember, by placing the object that locks our door as a marker along our path to leaving the house. This begs the question to ask what other objects might have been placed along our path to ease the task of remembering the lost practice of building canoes.

In Kirsh and Maglio's (1994) study of people playing the video game Tetris, they found that as the game accelerates, people increasingly rely on the physical rotation and sideslip movements in the video game as a stand-in for actually having to do the mental processing before executing a solution. This suggests that the hand (motor reflexes) may be quicker and more efficient at 'thinking' than the brain. All a player of Tetris really needs to know is that by pressing this button a solution may reveal itself quicker than trying to use offline cognition to visualize the correct answer. It also suggests that physically altering one's perspective may reveal new ways of thinking about the solution. People do this all the time. Take for example, when we position ourselves from different vantage points before deciding where to rearrange the furniture in a room. Or when someone asks us for directions, we often re-orient our bodies and use gesture to provide a clearer set of instructions.

Glenberg encourages us to move away from a traditional view of memory as for recall or memorizing and more for "encoding of patterns of possible physical interaction with a three-dimensional world" (Glenberg, 1997). But what happens if we aren't *fully* encoding patterns of possible interaction and if we don't even realize what is possible until we are right there in the moment of interaction? Wilson says, we actually quite often selectively leave information out there in the world to be accessed as needed, rather than trying take it all in on board and fully encode it (2002). Clark calls this the "007 principle," "In general, evolved creatures will neither store nor process information in costly ways when they can use the structure of the environment and their operations upon it as a convenient stand-in for the information-processing operations concerned. That is, know only as much as you need to know to get the job done." (1989: 64). What's even more remarkable according to O'Regan is that our perceptual apparatus doesn't even equip us well to do a good job at picking up detailed accounts of our surroundings (1992).

Our ocular organs have blind spots on the nasal side of the retina that should obscure a patch about the size of a tennis ball held at arms length; our saccadic eye movements should create smearing, displacement and blur, even just walking about should produce image slip (Steinman & Collewijn, 1980). The common misconception is that our brains have devised a compensatory mechanism to 'fill in' and interpolate these 'defects' of vision but this relies on the assumption that there is an internal picture (or representation of the world that has metric properties) that requires filling in (O'Regan, 1992). The embodied version of this conundrum really lies in the fact that sensing constitutes cognition through the active process of being able to constantly probe a world that remains available to us as an extension of our memory and this is the core utility of epistemic actions.

Beyond these somewhat trivial and ubiquitous examples, (sometimes referred to as 'low-tech' epistemic agency) the insight that epistemic actions offer for memory is that we are constantly sensing and scanning our surroundings and accessing information directly from the environment (rather than taking it in on-board) to alleviate the brute cognitive cost of having to remember lots of things. In this sense the task of remembering is not really a question of 'what do I need to know and where can I find it?' -since that information may not be readily available and we may be poorly equipped to find it- but it becomes more about 'how do I alter the informational character of the environment so that my ecological activity generates what I need to know? This will become a key concept in future chapter developments of how Indigenous people rely on situated cognition and ecological activity to generate from their environment what they need to remember.

It is also crucial to recognize that materials mediate our epistemic actions and when they do they are sometimes referred to as epistemic artefacts. To borrow an idea expressed by Mithen, "A fish trap traps fish, and hence it plays a direct economic role in the life of its user. But it can also serve as a guide for the construction and location of further fish traps" (2000).[8] The fish trap is a tool

[8] In Sterelny, 2004: 245.

and this tool when in action becomes an epistemic artefact. In the case of the Algonquin going into the forest to recover how to build traditional canoes; an appropriate analogy would be - an axe fells trees and guides the agent in selecting which trees are possible to engage with had they otherwise brought a chainsaw. It is fair to say that showing up with the right tool for the job, gets us incrementally closer, assuming the Algonquin ancestors also used axes. The fact that humans have an elaborate portable system of tools and epistemic artefacts at their disposal is a formidable and relatively stable and durable cognitive breakthrough that assists in narrowing the gap between forgetting how our ancestors once lived and being able to remember.[9]

To recapitulate, in this section I explored some of the main characteristics of memory from the theoretical perspective of situated cognition. I compared an example of cognition dealing with computational mental representations and one that is contentless and without representation to show how memory need not be inside our heads. I then outlined the implications that the 'representational bottleneck' has for procedural memory. I reviewed the literature regarding *offline* cognition, which is the ability to decouple from the immediacy of the present time and situation and engage in abstract thinking and includes recollecting about the past. I also identified ways that the mind shares the task of memory by distributing it throughout various features of the environment, in a process that is referred to as cognitive *offloading*. This is achieved through passive dynamics, the archival method, and with the use of epistemic actions and artefacts.

2.4 - Remembering without a trace: The holy grail of Enactive Cognition

An enactive approach emphasises how memory exist only in its state of execution. As Neisser says: "remembering is a kind of doing" (2006: 203). To the enactivist, it makes no sense to look

[9] In chapter 5 on material inheritances I will return to this idea and develop it further within the frameworks of MET's Extended Mind and Stiegler's theory of tool prostheses. For now, I just want to touch on it briefly within the context of epistemic artefacts.

for stored memory *in* places like the body or the brain or even outside embedded or distributed in external resources, as our understanding of memory is best served by descriptions of phenomenological circumstances in the interactions between people and their environments, which make it possible for acts of memory to occur. One of the core principles of enactive memory is the notion of *autonomy* where every living organism is capable of self-generating all they need to know through their ecological activity (Varela et al. 1991; Thompson, 2007, Froese & Di Paolo, 2011; 11-13). Also crucial from an enactivist perspective is that memory is not merely a product or offshoot of our ecological activity, but rather our memory *is* the activity as it is articulated. However, enactive interpretations of memory do not by virtue provide clear passage beyond the storage model, for it is still possible to subscribe to an archival model of memory within the enactive formulation of memory with the possibility that it is our ecological activity that makes information from past events available to the organism again in the future.[10] An enactive approach, nevertheless, makes good headway towards a theory of mind that shifts away from archival models. But for this we are presented with a few options.

2.41 - First Option: Constructionist theory

The first option that avails the enactive memory theorist involves a bit of sitting on the metaphorical fence and trying to have things both ways with a constructionist approach. Pioneered by Bartlett (1932), a constructionist view of memory is considered one of the earliest articulated 'enactive' models. Bartlett developed his ideas specifically as an alternative to the 'trace' theory of memory, which in his time was the dominant metaphor synonymous with an internal brain-bound storage model. His objection to memory traces were two-fold. First, that memory traces were considered faded copies and static marks left by the original event. Second, that traces reduce memory to an isolated mental achievement. He questioned the dominant

[10] There are enactive theorists of a first order who argue that the very activity of looking things up in the notebook or even the activity of daydreaming constitutes the enactive nature of memory. And the 'enactive' aspect of memory is never the retrieval of a fixed object, but rather always open to interpretation and influence of the current retrieval conditions. Simply stating that consulting the notebook that contains externalized memories is in itself an active process, is not the kind of enactive memory that I wish to pursue here, nor is it in line with MET.

theory by rejecting one of the most basic assumption of memory. “How millions of individual traces can persist in the mind or in the central nervous system” (Bartlett, 1932: 226) And he thought there ought to be a more accurate way to describe the memory phenomenon. In his words: “Remembering is not the re-excitation of innumerable fixed, lifeless, and fragmentary traces, it is an imaginative reconstruction, or construction, built out of the relation of our attitudes towards a whole active mass of organized past reactions or experience” (1932: 213). The compromise that involves a bit of sitting on the fence with a strong constructionist approach is because, as Bartlett mentions, here memory is considered to be part re-construction and part construction. In other words, they are not denying that there is some kind of informational content from past events being carried forward to inform the construction of memories. However, constructionists aren’t willing to concede to archival storage models of memory either. What Bartlett was aiming towards is the development of an approach to memory where ‘remembering is considered a “situated activity” of the whole organism active with its environment’ (Wagoner, 2013: 3). Memory by this description is fairly compatible with a Material Engagement approach, however, there are some nuances.

In Bartlett’s time the construction of memories was considered somewhat of a dirty word; a distortion of the facts or inaccuracy from the gold-standard of faithful, factual, literal recall that concerned most rigorous scientific measures of memory. But Bartlett took what was considered an undesirable defect -the construct- and recognized that this is actually an important core feature of the memory process. He also noted that this ability to construct memories (as opposed to merely re-constructing them) was a what crucially enabled an organism to adapt their responses in rapidly changing environments rendering procedural memories portable. (Like Michealian, procedural memory, taken to logical extremes as the storage of rigid task sequence, would be causally inert) (2011; 179). According to Bartlett: “So-called “literal,” or accurate, recall is an artificial construction of the armchair, or of the laboratory. Even if it could be secured, in the enormous majority of instances it would be biologically detrimental. Life is a continuous play

of adaptation between changing response and varying environment" (1932: 16).[11] Bartlett proposed instead of memory traces, which allegedly were the infinitesimal inscriptions of a lifetime's worth of event on the brain, it would be best to adopt "schemata" a concept better adapted to explain how memories are situated, contextualized and textured in action.

In an interesting flip-flop, nowadays the meaning of the term schemata has been corrupted to mean a sequence of operations or prescribed order of gestures much like a mental template or fixed recipe of how to act. This can be seen, for example in Leroi-Gourhan (1993), Lemonnier (1993) and Schangler (1994) who each acknowledge the malleability of raw materials acting in dialogue with the maker, such that that no single technological sequence could even be isolated before they "escape into other sequences" (Conneller, 2011: 19), yet sequentially scaffolded operations did little to shake the prescriptive, premeditative and fixed connotations from the ways archaeologists have come to use the word *schemata* in more recent times. In Bartlett's time, however, influenced by his colleague and friend Henri Head at Cambridge, schemata were the unconscious awareness of our body's position that is refreshed and updated on the spur of the moment ready to adjust with each subsequent and future move. As Henry Head (1920) explains: "By means of perpetual alterations in position we are always building up a postural model of ourselves which constantly changes. Every new posture of movement is recorded on this plastic schema and the activity of the cortex brings every fresh group of sensations evoked by altered posture into relations with it" (605-606). As Wagoner explains schema, to Bartlett were "a holistic and constantly revised record of one's position, which provides the baseline for one's next movement. […] Schema is a kind of active and continuously revised memory." (2013: 5). MET crucially restores schemata closer to its original enactive essence: "The point is not to deny altogether the existence of mental models, schemata and internal planning procedures as active in the course of any creative process, but rather to recognize them as the temporally emergent and dynamic products of situated activity" (Malafouris, 2004: 60).

[11] Quoted in Wagoner, 2013: 4

Ironically, memory traces gradually came to mean something more like the original meaning of schemata, as something entirely malleable and emergent in the context of the expression of memory but not as a pre-existing form.[12] I say ironically, because it is only once Bartlett's constructionist approach became widespread and successful could the cognitivist's version of the memory trace as static storage (which he railed so hard against), be recast and seen in the new light of emergent dynamism. Trace theorists such as Tulving (1983), Schacter (1996), and Sutton (1998) accept the idea (though not uncritically) that past events may leave their 'trace' somehow as exograms and engrams but they disagree in the details of how these traces participate in memory. Sutton (1998) follows Wittgenstein (1980) who offers: "Whatever the event does leave behind, it isn't the memory" (220), to lean heavily on a constructionist view of memory that allows for traces to be brought into the creativity of emergent mnemonic imagination. Sutton makes his case for an enactive anti-archival memory by saying: "Why should we expect all the psychological work of editing and condensing to have been done already, […] rather than occurring in the present in a causal conspiracy between different distributed traces and context-specific cues in current input?" (1998: 93).[13] As Loader points out Sutton's strong constructionist use of the concept of memory traces, "might allow that nothing need to be stored between an event and its remembering, which counts in any strong sense as an 'inner surrogate' of a particular memory" (2013: 173). There is, however, a second option that is worthy of a brief

[12] In effect, the 'drift' in meaning was not haphazard genealogy. A good argument could be made to demonstrate how most early 20th century trace memory theorists were structuralists but then with the success of constructionist theory of memory the trace metaphor jumped camps and was picked up by functionalists. Whereas schemata did the opposite in that it was originally a term developed by functionalist that gradually got taken up by archaeologists who had more conceptual allegiances with structuralists.

[13] Though Wittgenstein is not opposed to the idea of memory traces either, as evidenced by the following statement: "An event leaves a trace in the memory: one sometimes imagines this as if it consisted in the event's having left a trace, an impression, a consequence, in the nervous system. As if one could say: even the nerves have a memory" (1980: 220). Yet elsewhere Wittgenstein seems to contradict himself saying: "Nothing seems more possible to me than that people some day will come to the definite opinion that there is no copy in either the physiological or nervous system which corresponds to a particular thought or a particular idea or memory" (1980: 508) Anti-trace theorists like Stern, and Shanon cite the latter Wittgenstein for his rejections of representationalism and use this to discredit the trace theory of memory. Whereas anti-storage theorists cite the former Witgenstein. It becomes therefore somewhat complicated to reconcile what Wittgenstein intends by the former as a statement that is pro-memory-trace, vs. the latter as a statement that is anti- representation. However, when used in the manner that Sutton intends with a strong view of constructionism with distributed memory traces, Sutton's interpretation of Wittgenstein allows for an extended view of memory that is at once anti-representational and anti-storage.

sketch for further anti-trace, anti-storage insights beyond those presented with strong constructionist leanings.

2.42 Second Option: Ecological approach with direct operational skills

To challenge the governing theory of the memory trace is to chart a lonely course in some very dusty and esoteric corners of philosophical debate. If memory storage is the 'root metaphor', then trace based theories are the rhizome that propagate underground and crops up at nauseum. Indeed, it is almost never questioned *if* memory traces exist, but rather what forms traces find expression and how they can persist. Remarkably, the memory trace even manages to evade being disavowed by constructionists, who try to have it all by being at once anti-archival and yet somewhat awkwardly cling to the notion of memory traces. Considering there is so little empirical uniformity in the otherwise vast and varying bodies of literature on memory, the near universal and wide-spread adoption of the concept of the memory trace is no small feat. Could enactivist theory be re-invigorated from Bartlett's original objective, which sought to extricate cognitivist notions of static traces, by trying afresh to severe ties with the modern-day re-invention of the dynamic memory trace under even stronger (or more radical) constructionist terms? Is there space for cognitive memory process that are appropriately re-configured as dynamic, embodied, enactive, extended, without the stowaway baggage of archival traces? Is radical enactivism the only bold attempt to articulate a traceless theory of memory by abandoning all informational content altogether? Investigating the options for a trace-less memory theory a little bit further is worthwhile because it offers some additional insight into why most memory theorists find the possibility of trans-generational memory so counter-intuitive.

Objections to memory traces can be summarized on the following grounds: 1) Memory traces invoke representational models; even if traces are not actually fully-fledged memories and even if they are scattered beyond the bounds of the organism out into the world, they are still bits of

"distributed representations" (Stern, 1991: 208; Shanon, 1998: 165).[14] 2) Memory traces are denied on the grounds that they are unobservable, unexplainable, and that outside of the conditions of their retrieval environment memory is "strictly speaking non-existent" (Toth & Hunt, 1999: 257-258).[15] And 3) Trace theory is neither completely denied nor completely adopted but rather circumvented by being reconceptualized within an ecological view that studies the whole organism performing its directly operationalized skills within its environment.

A process-oriented ecological view articulated by Toth & Hunt (1999) illustrates some of the difficulties that can arise with memory traces. They reject memory traces on the grounds that they are all too similar to memory storage models because traces (i.e., cognitivist memory storage traces), assume "memories exist (have ontological reality) when not in use" (257). Toth & Hunt explain nicely how memory is an activity: "Memory is not something stored 'in' the person or even 'in' the brain, any more than music is stored in the radio, or walking stored in the legs. In each case (memory, music, and locomotion), the system under investigation has the potential to achieve certain states, or *exhibit particular actions,* when relevant conditions are met, but these states or actions do not reside in the system. Like walking, memory is a dynamic event that exists only in its operation. [*cont'*] By this account, remembering is essentially a form of perceiving […] [that] cannot be defined outside of the retrieval environment" (257-258). They agree with Kolers that memory is "simply the set of operations used in dealing with the events" (263). As Kolers says: The 'transfer between tasks varies by degree of correspondence in procedures' - *There is nothing else* (Kolers & Roediger, 1984). They go on to explain that "rather than stemming from differences in hypothetical memory systems, variety in the expression of memory arises naturally out [of] the numerous skills or procedures that people have for interacting with their environment" (263).

[14] This follows from an Aristotelian interpretation of memory traces which posit them as causally derived in some way or another from previous perceptions of past objects or events.
[15] The origins of this idea are attributed to Angell (1906) that Toth and Hunt cite being quoted in Herrnstein & Boring (1965). The original quote being "No matter how much we may talk of the preservation of psychical dispositions, nor how many metaphors we may summon to characterize the storage of ideas in some hypothetical deposit chamber of memory, the obstinate fact remains that when we are not experiencing a sensation or idea it is, strictly speaking, non-existent."

Toth and Hunt, use a memory-as-operations framework to show instances of task demands and goals where memory in the retrieval environment is highly context specific (i.e. similar to Dreyfus where the background draws out and elicits through the particularities of the context in which the organism finds itself). For example, these studies test memory comparing it to the time of "initial encoding" (their term) in 'implicit memory' and "traceless QM (quasi-memory) system" (Hayman and Tulving, 1989), which found people 'strip episodic details at the time of encoding from remembered events' and that 'different responses occur when subtle changes are made to the retrieval cues.' These are promising theoretical advances. Digging in a little deeper and describing the memory-as-action across the procedural divide, Toth & Hunt say: "whatever memory is (system, process, or perhaps, disposition), it will have to be explained in terms of the relation or interaction between what a person was *doing* when an event was first experiences and what they are *doing* when that event subsequently exerts its influence" (1999: 255). An operations approach to procedural memory posits that traces cannot exist outside of the retrieval event where procedural memory is the operationalizability of skills 'to carry out certain activities provided the "context, task, goals, mental set, etc. present at the time of initial learning are also reinstated, either driven by external stimulation or reconstructed internally by the rememberer" (*ibid.* 257).

There is another intervening critique of the memory trace, that is so marginal it has yet to get any attention outside of its first mention in publication. In De Brigard's three ways of understanding the memory trace, the first is by "*direct epresentationalism*" which he defines as: "takes a memory trace to be a mental representation created only *after the remembered object has been perceived*, for perception is understood as being un-mediated, i.e. as involving no intermediary perceptual representations." (De Brigard, 2014a: 403 emphasis added). (Without diverging into the merits of the dubious use of the word representation) this is a maneuver that would make disciples of Derrida's deconstructionism proud, notice in this position De Brigard

manages to hold on to the idea of memory trace by re-defining it entirely as its opposite cancelling out the whole premise that a memory trace might precede the conditions of the retrieval environment. De Brigard (2014 a) offers this explanation: "the conclusion that they exist is not on the basis of having found them", rather memory traces are "theoretical entities whose presumed existence is the result of an inference to the best explanation (IBE)" (403).

2.43- Third Option: Anti-Trace Theory with Radical Enactive Cognition

Another avenue is provided by Radical Enactive Cognition (REC). A radical enactivist theory holds that all memory (even episodic memory) begins as content-free cognitive interaction scaffolded on contentless sensory imagining (Hutto & Myin, 2017: 177-202; Hutto & Peeters, 2018: 111). The hallmark of this approach being what Hutto & Myin dub "the hard problem of content" (HPC) (2013). REC does not entirely deny that there is such a thing as contentful states of mind, but instead views content as only something that arises from the unique achievement of social practices of symbolic communication and public language use (2017: 145). Influenced by Wittgenstein who says: "there is no copy in either the physiological or nervous system which corresponds to a particular thought or a particular idea of memory" (1980: 508);[16] REC describes cognition as: "Contentless notions of information-as-covariance and the norms of biological functionality is all that is needed for understanding basic minds" (Hutto & Myin, 2017: 41). To REC these co-variances are our biological neural pathways interacting directly with environmental (and sometimes social) resources (Hutto & Peeters, 2018: 108).[17]

REC makes use of teleosemiotics, to explain how non-semantic 'target-focused contentless intentionality,' enables humans to relate to each other and to objects directly with sensorimotor "causal co-variances" and "embodied anticipations". Teleosemiotics challenges conventional

[16] Quoted in Loader, 2013: 174.
[17] Similar to the Dreyfus' version of embodied cognition.

models where mental states are understood as having similar semantic properties and structure of language expression (Hutto, 2011: 50). REC's position is that it is a mistake to confuse the informational character of the output or end product of how we sometimes express our memories, for the nature of a memory at its roots. According to REC the idea that the brain supplies information to the organism, as well as the inverse - that an organism's activity and sense perception in a particular environment supplies the mind with contentful messages; is unfounded. Hutto & Peeters declare these misconceptions as "serious scientific mysteries" (2018: 107). REC proposes that the roots of episodic memory are much the same as the roots of procedural memory, in so far as neither type of memory traffics in informational content. With REC episodic memory comes down to "re-creative simulative imaginings" and procedural memory is explained as a process of "re-creating patterns of activity in neural pathways in response to particular cues and prompts" (2013: 113). In effect, Radical Enactive Cognition refutes storage models of memory, by denying the existence of informational content as an accessible commodity or pre-cursor to all kinds of memory. REC elaborates a view of cognition that is based on the widespread co-variances of non-intelligent, non-representational phenomena, to explain how humans relate to each other and other objects in the world without the need for articulated intentions thought.

Fortunately, the hard problem of content (HPC) is not something all enactive memory theorists need to take a definitive stand on in order to advance a view of memory that is both anti-archival and anti-trace. Michaelian offers an alternative to a radically enactive approach. He says humans "have a well-developed capacity for detecting natural kinds" (2011: 182) and that procedural memory (*remembering how*) is fundamentally different that declarative memory (*remembering that*). Procedural memory "does involve the modification of the brain of the organism on the basis of its experience; unlike declarative memory, it does not involve the modification of the brain of the organism as a means of making information acquired in the past available again to the organism in the future. [cont'] There is no need to posit the storage of information by nondeclarative [i.e., procedural] memory, for the simple reason that any such stored information

would be causally, and hence explanatorily, inert" (179). What Michaelian is hinting at here is a proprioceptive intelligence where procedural memory is purely constructionist.

2.44 Interim discussion on MET: Enactive memory still too archival

All of the above three options articulate strong cases for anti-archival and anti-trace notions of memory. But from MET's perspective they are still too archival. MET find talk of neural pathways being triggered by "cues and prompts" or driven by "external stimulation" as suggested by REC Hutto & Myin (2013: 213), or in strong constructionist terms of Sutton (1998: 93) and in anti-trace position of Toth & Hunt (1999: 259-262) a bit unhelpful. Crucially for MET, the situated environment and its materials aren't just causal stimuli through which acts of remembering occur; they are the bi-directional agents of causality constituting memories as they emerge along the extended mind's networks. Malafouris and Koukouti explain, "The external material environment and forms of material culture that surrounds us are not just cues or prompts for memory processes that happen inside our bodies or our heads. Instead, they are continuous and co-constitutive agents of recollection" (2018: 12-13). Objects do not just provoke, change, or re-shape the human capacity for memory but rather they are themselves the 'stuff' of procedural memories proper. "Making is no longer the sequential unfolding of mind into matter via the medium of bodily action. Making is thinking in action. I do not mean that thoughts are expressed in material form. I mean that the actual *material expression is the thinking*" (Malafouris, 2020: 11).

Though MET has no particular objection to the taxonomical use of the term "memory traces" per se there are some key differences that warrant further discussion. MET allows for memory traces, provided they are defined within an extended mind's enactive framework as purely emergent in the act of remembering. As such traces do not pose great conflict with MET's fundamental view that memory is a creative process that 'thinks and feels with and through things' in action through

our material engagements (Malafouris, 2013; 2014, 2015). MET's position is actually more closely aligned with the arguments articulated by anti-trace theorists like De Brigard and less so than the strong enactive constructionist terms offered by Sutton. I'll take a moment to explain the difference. Citing Tulving's notion of "synergistic ecphory" (1983: 12-14), Malafouris & Koukouti stipulate that "memory traces, 'internal' or 'external' are mere incomplete potential contributors to an open and context-sensitive process of remembering spreading across the body and the material world. (2018: 4). Sutton too is with Tulving, saying: "any inner memory traces – *whatever they may be* – are "mere potential contributors to recollection," conspiring with current cues in rich contexts" (Sutton, 2006: 282, emphasis added). The concept of memory traces - or *whatever they may be*- is adopted almost reluctantly by anti-storage memory theorists because it is problematic, however, to date there is no better metaphor with which to replace it. Still a decent amount of ink and energy is spilled extricating and distancing oneself in every respect possible from the associated representational baggage of the former archival model of classical cognitivism's original use of the term. In the same tone MET accepts the use of the idea of memory traces, provided it is disinfected from its heritage of memory storage.

But there's a subtle difference between Sutton's version of memory traces (who works mostly within extended and distributed frameworks) [18] and Malafouris, who is developing extended, enactive and agentive approaches. Earlier Sutton (1998) asks: "What then is the memory trace? Where does the trace disappear to between experience and recall?" (9). Sutton could have wondered instead: Why when we believe we recall something, do we have a feeling there's a memory trace from some earlier event or experience? Even the rhetoric of "*whatever they may be*" already gives traces an ontological stage before one could even ask if prior events conspire with current cues at all. MET's is less concerned with speculating how memory traces might be causally linked with prior events. This is reflected by MET commitment to studying cognition not

[18] To his credit, Sutton is a highly respected scholar for his impressive contribution to the field of memory studies. It would be unfair to pigeon-hole his theories on memory as operating within just one or two framework, because he has given an impressively wide scope of scholarly work on memory with historical depth and breadth of knowledge. That being said my reading of his research, a lot of it is framed within the extended and distributed models of cognition.

as cues in current contexts but as an emergent phenomenon based in the rich sensory contexts of our material engagements. In Malafouris' words: "[a MET framework] change[s] the way we think about the mind by bringing materiality – that is, the world of material things and signs- firmly into the cognitive fold. (2018: 6). MET allows for "memory traces [to] exist on the 'inside' in the form of neural activation patterns or bodily habits as much as they exist on the 'outside' in the form of material signs, structures and artefacts [where] both kinds of traces are needed for the act of remembrance to take place" (Malfouris & Koukouti, 2018: 14). But notice MET only speaks of memory traces as neural activity and material signs or structures as a phenomenon in the present. This does not causally link memory traces to originate in any sense as a mysterious ethereal relic of a past event. The implications of the inseparability of both materials and mind as they conflate and conspire together in the emergence of cognition, means memories can never really exist before meaningful engagement between bodies and materials. This subtle, yet important, difference between Sutton and Malafouris' approach to memory traces means within a Material Engagement framework, cognitive traces of memory are not something that the human cognizer brings *a priori* to the arena of memory - there is only the 'semiotic conflation and co-habitation of material signs that are themselves an emergent property of cognition in an arena of situated activity.' (2018:6). It is in this way that MET is actually conceptually more in line with De Brigard's anti-trace arguments than it is with Sutton's strong constructionist position memory traces.

To a lesser degree of interiority, Toth & Hunt's (1999) are similar with their suggestion that memory could be explained by its relation to what one was doing when an event was first experienced and then similarities to the conditions of what one was doing during its retrieval. As it corroborates with research in neuroimaging that shows evidence of the same regions in the sensory cortex are reactivated during the recollection of an event as those that were initially active during the perception of the original event (Wheeler et. al. (2000). De Brigard (2014b: 172-173) also corroborates with Wheeler et. al. (2000) "As I pointed out, evidence shows that the same regions of the sensory cortex recruited during the perceptual processing of a particular

event are later on reactivated during the recollection of the same event" (172-173). De Brigard says: "Indeed, the more we know about brain processes, the clearer it is that far from being an exception, massive redeployment of neural systems may actually be the rule" in the redeployment for other cognitive tasks. (2014: 173) However, MET finds De Brigard's (2014) suggestion - that memory should be investigated based on the massive redeployment of neural systems reactivated during the recollection of the same event – strangely at odds with the kind of anti-trace thesis he is pursuing. It is still all too archival. Though they seem to suggest the reactivation of patterns of neural activity are evidence of a special internal cases of the inscription of memory traces, it actually suggests just the opposite.

From a material engagement view, there is no reason to believe that patterns of neural activity correspond to the kinds of content-based memories that cognitive science often suggests constitutes a memory trace. What could appear as the long-term storage and reactivation of activity within the sensorimotor cortex, is only a small part of the memory process when we go looking for evidence within the brain. Instead, MET finds that memory can only be described as a "real-time entanglement of neural, bodily and material affordances" (Malafouris & Koukouti, 2018: 10). Taken in that sense memories do not need mental traces, because through our everyday operations the environment acts to offer an extended phenotypic plasticity in the material structures themselves that elicit familiar patterns of sensory perception, without ever requiring to have an 'on-board' trace or memory of the original event at all. If there is to be any discussion of the mapping of memories, it must take into full consideration the extra-neural networks that entangle situated bodies and material into the depths of these historical contexts.

From the perspective of MET with its guiding principles and theoretical implications of an enactive and extended mind's memory, the perceived problem, (or irrational opposition) to transgenerational memory is vastly diminished. I sympathise with Maurice Bloch who complained "attempts to acknowledge social aspects of memory are thwarted by their use of a much too simple notion of a person and their failure to grasp the full complexity of the

engagement of the mind in culture and history" (1996: 216, 229). Indeed, memory studies have remained tightly wed to the classical cognitivists' root storage metaphor and standard units of analysis of the individual human biological architecture. Accompanied with this is the corresponding baggage that all memories must somehow be retrieved through a direct human link or transmission to the time of original 'encoding' or through materials that have been embedded with memories as a feature of their exographic or iconographic storage capacity. My research on memory and cultural revival with MET challenges conventional notions of memory that attempt to reduce it to its constituent parts of ephemeral traces or external memory with embedded content as an information storage system.

To reframe the question then of how natural resources and skilled agents operate on different experiential levels to participate in the reanimation of ancestral memories over vast temporal scales, - at least concerning procedural skills (i.e. the 'remembering how' part) - the evidence above overwhelmingly corroborates that if such a feature of human memory were indeed possible this feat need not requires any informational content or memory traces explicitly linking the recovery of such skills to past events lived by the individual. Remembering without a trace is worth channeling to guide cognitive theory beyond individual phenomenon of memory or as its own artefact towards an ecological view that is based on direct perception and sensual similarity in the spur-of-the-moment construction.

In fact, within these parameters of an extended mind's memory, arguably all that is required to perform similar ancestral lifeways is for both human and material agents to provide each other with the neural networks and material signs which are the basic requirements for acts of remembering to occur. This is where MET excels, from the principle of equal agentive participation rather than mere symbolic equivalency or surrogate substitution (Malafouris, 2019a, 2019b: 4). Materials therefore do not contain encoded memories or information, they

help think through things in action by engaging "memory according to the interactional properties which they afford to particular actors in particular settings" (Malafouris 2004: 56).

Currently it is not possible to speak about memory without dredging up some evocation of the past. Nor is it immediately obvious how such a conception of memory would even be useful if memory was purely a creative process that had absolutely nothing to do with the past events. It would make no sense in wondering how or who might be able to have access to ancestral knowledges. We might just as well talk about task-oriented procedural skills as the spontaneous sobering up to environmental presentation of future goals and anticipations. Constructivist memory theorists are faced with a dilemma whether to commit to a radical notion of memory that is a purely imaginative phenomenon, or to acknowledge that there is indeed something that is brought up afresh from the past. To remain faithfully anti-archival, involves a careful balance simultaneously recognizing that memory is neither absolutely the pure spur of the moment imaginings but also may include elements of re-constructivism. This does, however, present a slightly awkward paradox. It is precisely the enactive framework of MET's enactive memory that brings into full relief the agentive powers of materials and the constitutive role that landscapes have in memory, which challenge the way we think about external resources on radically different terms other than the ubiquitous tropes of the memory storage and trace models. From MET's perspective, "the process of remembering is not merely constructive or reproductive; instead, it is creatively enactive; past events are not stored or reproduced but they are not entirely constructed either" (2018: 14).

2.5 Memory and Material Agency

An understanding of the cognitive process involved in memory cannot just be approached from the frame of reference of the human cognizer. For this reason, I will now pursue the concept of

material agency and how materiality shapes human experience and contributes to the embodied and enactive dimensions of memory.

I will now turn to my second research question, which asks "what role do materials have in transmitting cultural memory among skilled practitioners?" I begin with a brief example from an intracranialist view of cognition to show how this position is unhelpful for thinking about the agentive powers of materials. Much of the literature on material agency is centered on philosophical debates about causality and intentionality. After reviewing these debates, I move on to compare a strong case for material agency made by Latour, with Actor Network Theory and a diluted case by Ingold with conditions and affordances. By way of conclusion, I discuss the implications material agency has for memory and the methodological problem posed by elusiveness of procedural memory.

In material culture studies the idea that artefacts are a reflection of the mind that made them still persists. In archaeology, this can be attributed to Deetz (1967) who claims that there is a prototype or "mental template" that precedes the actual making. This invariably leads to the idea that there must have also been some kind of 'procedural template' in the mind of the maker as well (Gowlett: 1986). As a higher degree of standardization is observed in the archaeological record, -so the story goes- so too is the refinement or 'clarity' of the mental template (Dibble, 1987; Mellars, 1989), which leads some to believe that there must also have been socially well-defined parameters in place to stabilize mental schema that include the ability to communicate through language (McNabb et al., 2004; Nowell et al. (2003). This simple and direct correlation between an internal conceptual model and external creation has a deeply rooted history that supports a particular worldview where man is seen to exert his dominion upon all things and where he may impose form onto an inert 'blank slate' of material (see Chase, 2008; Godelier & Thom, 1986: 11).[19] This model is also incomplete. Artefacts at best provide a fragmented, oblique glimpse into communities of practice and are by themselves scant substitute to developing a

[19] The widely used terminology of 'blank slate' such as in lithic cores further reinforces power asymmetries that portray materials as being empty.

framework for recovering the complex skills developed by people who actually live and move with the land. While internalized models of mind with the notion of mental templates may have facilitated technological analysis that focused on function, attributes, form, features, typology, style etc. it failed to consider the complex manners in which objects and people co-mingle and are each ravelled up in a process of shaping, transforming, and informing the other. For this we need a study that utilises material engagement and material agency.

2.51 Intention, causation and action

Part of the problem to do with material agency, is what Malafouris calls an "imbalance between mental and physical causality" (2008: 22). When consciousness is taken to be the source behind the actions we perform upon objects, (as exemplified in the above "mental template" model) it is easy to see how people are left with the feeling that they are the sole cause of what is being done (e.g. "I made this!"). This imbalance is dealt with in debates about intentionality, which occupy a significant space in the literature about agency and is central to the question of how objects and people get tangled up with each other. At its origins in philosophy of mind, early debates about intentionality were used to set the boundary between human consciousness, a feature of which is intention, and material realms, which are denied intention. Given that intentionality is considered a diagnostic feature of agency, the lack of perceived intentionality in objects presents itself as a major impediment to material agency (Malafouris 2013: 136-7). To begin thinking about material agency with intentionality would appear to be a bit of a non-starter.

One strategy for buttressing an argument for material agency involves attempting to diminish human agency by casting doubt on the extent that people are actually the cause of their own actions. Wegner says that people are often confused or mistaken about how 'conscious will' translates into action and he describes a series of two errors that people commit: first of *apparent*

mental causation, and second of *agency attribution* (2004, 654).[20] Gallagher also describes a similar phenomenon of people having a *sense of agency*, which is about the ability to reflect that you are the author of your own actions, and is related but not quite the same as having a *sense of ownership*, which is the feeling that your body is always present and available for sensory perception and physical movement (Gallagher, 2007). (Note the choice of words *apparent* and *sense* leave plenty of room to doubt whether our 'feelings' of causation are correctly correlated.) Body ownership is mostly taken for granted because we rarely question how we are able to control our body at will, "due to the match between motor intention and sensory feedback" (Tsakiris et. al. 2007, 2235). While it is fairly evident that proprioception (the matching of multisensory experience to body movement) provides a strong cue for the sense of body ownership, it is less clear how body ownership contributes to a sense of agency. Gallagher goes on to explain, a sense of agency arises when there is accordance between the expression of our actions and our intentional states (2007), thus hinges more on intentionality as opposed to mere motor control, which as Graham and Stephens (1994) point out could possibly involve involuntary movements or actions that are discordant with our intentions. This leads Tsakiris and Haggard (2005) to question whether intentionality and voluntary bodily movements are a good measure of agency or if it has more to do with the end results of the causal events that led to the accomplishment of a task. While philosophical questions about intentionality and causal effect help to diminish the case for the human monopoly of agency, it still says very little about materiality.

Gell (1998) offers another way forward. He acknowledges these philosophical debates and says little to contradict them: "Agency is attributable to those persons (and things, see below) who/which are seen as initiating causal sequences of a particular type, that is, events cause by *acts of mind or will or intention*, rather than the mere concatenation of physical events" (1998: 16 emphasis added). However, when he says "and things, see below" he goes on to explain that fortunately for anthropologists, we may describe "folk" notions of agency that are "socially and

[20] In Malafouris (2008: 21)

cognitively practicable" without being subject to strict philosophically defensible forms of agency (1998: 17).[21] To Gell, the fact that some people prescribe intention, causation and agency to objects makes it a worthy tenable line of inquiry. The pitfall is that now these objects have to rely on people, which he calls 'primary agents,' to attribute agency to them. As such he classifies objects as 'secondary agents' because they aren't self-sufficient agents but rather only "emerge as agents in very specific social contexts" (i.e. human ascription) (1998: 17). Which is at once the strength and weakness of his argument because while it is helpful to think about intention as arising from social context, this also presents an inherent contradiction. As Malafouris remarks, "to call humans "primary agents" is to place human intentionality *before* material engagement […]" (2013: 136). And as Gosden remarks, "to call objects secondary agents is to make them look like people, but with certain deficiencies of intention" (Gosden 2001: 164).

To help resolve this contradiction, Malafouris draws on the distinction Searle makes between *prior intention* and *intention in action*. To Searle, prior intention is premeditated before taking action, whereas intention in action is non-deliberate everyday activity where no intentional state is formed in advance of the action itself (2013: 137). Now according to Searle intentional states of mind are still a kind of representational schematic humans deploy when deciding how to act in the world. Even intention in action is essentially just another form of representational thinking where the timing of the intention and the action become indistinguishable because they are both done on the fly (2013: 139). But Searle also explains that in order for (either kind of) intention to actually work it must meet two requirements. The first is "direction of fit" – where the conditions in the world must fit with the intentions in the mind. The second is "direction of causation" – where the intention of mind causes the agent to move in the world (2013: 138). This is important because it begins to open up a crack where intentionality is conceived not as something that is an exclusive mental state of humans, but rather as something that needs to fit in sync with the external conditions in the world and, at least in most circumstances of day-to-day activity, are

[21] I sympathize with Gell, at least from a pragmatist's perspective, when he presses forward essentially urging us to consider how thinking about the agency of things can be useful, (regardless of whether it is true or not) but on the basis that it is worth investigating because there is a belief or "folk" notion among the people we wish to study.

not preceded by our actions and engagement. Malafouris says at any rate Searle's 'prior intention' has yet to have any pragmatic effect in the world so it is simply a "matter of private thought and imagination" (2013: 140). Thus as far as intentionality in agency is concerned it cannot possibly be an internal state but rather it is a property of extended cognition that is inseparable from activity and our material engagements. The imbalance between mental and physical causality collapses and the problem with agency and intentionality falls apart because neither can exist prior to (or inside of) anything until the moment they are mutually constituted by our actions.

2.52 A strong version of material agency

Traditional social-constructionist views have been negligent in acknowledging how objects contribute to the process of being made and it has failed to recognize the key role materials play in the mutually supportive and transformative process of humans becoming skilled practitioners. Callon and Latour's science and technology studies (STS) program, proposed a radical paradigm shift away from an individual internal analysis towards a more interactive one of actor-networks (ANT). The very notion of material agency can be seen as part of a broader shift to populate the social sciences with nonhuman beings on a more equal footing and "partly strip humans of their hegemony as social agents" (Descola, 2014, 268). Indeed, another strategy to begin making a case for material agency is to start by unpacking *agency* from its anthropocentric origins. ANT makes a very strong case for material agency.

ANT does not begin from the premise of sophist arguments about mental states of intentionality. With ANT, agency is understood as neither an inherent property of the person nor of the thing, but rather as something that arises out of the symmetry of actants' equal association within the network. As Knappett says: "Agency comes to be distributed across a network, inhering in the associations and relationships between entities, rather than in the entities themselves" (2002,

100). The conceptual attraction of ANT is in elevating artefacts from passive objects to be negotiated as an equal actor-entity for what they '*do'* with the other participants in the network. Whether they are human or nonhuman they are taken to be functionally equivalent. For example, a park bench with a center armrest becomes a moral agent, when it acts as a deterrent for sleeping but still allows sitting. Moreover, the bench is instructing people how to use it. The bench lures people into an "action program" to borrow the language of Latour (1999, 178), which is a series of goals and steps and intentions that says if you try to sleep or lay down I will make it terribly uncomfortable for your body. ANT makes entirely new interpretations and analysis possible when people are no longer seen to have the monopoly on agentive powers and when agency instead arises through terms of reciprocal interactions in networks. But ANT raised a lot of ethical and epistemological questions. For example, if objects are also actors do they have rights? Are they politically active? ANT should not be misinterpreted as an argument for anthropomorphism where objects are now reconfigured to be imbued with human qualities. Instead, it forces us to reconsider what happens to categories like personhood when this is entirely renegotiated within the new heterogeneous networks of interacting materials (Law, 1992) and to think about what happens to things when they become entangled in the extended mesh of intelligence, morality, and responsibility.

2.53 A diluted version of material agency

Ingold, takes issue with ANT's notion of distributed agency because he says there is no sense in calling inanimate objects 'actants' because they don't act, and they aren't really active participants in a network (Ingold, 2008). Instead, he prefers to see things like air or rocks as creating certain conditions that make interaction possible, but not as equal agentive partners (213). "Our concept of agency must make allowance for the real complexity of living organisms as opposed to inert matter. It is simply absurd to place a grain of sand and an aphid on the scales of a balance and to claim that they are equivalent" (214). Ingold's qualifying criteria for agency

seems to require an "attention to movement" in an "instance of action" thereby making agency possible for some non-humans but certainly not for things without life or consciousness (214). That's not to say he doesn't believe air and rocks occupy an important role, but he thinks studies on the materiality of objects have lost touch with the important properties and qualities of materials whereas the "tangible stuff of craftsmen" has been taken over by abstract philosophical ruminations about agency, intentionality, semiosis, and spirituality. [22] Instead Ingold calls attention to Gibson's discussion about *medium, substance* and *surfaces* (1979, 16) –where air is the medium that allows for movement and perception; things are the substances and building blocks for life; and surfaces are the interface between the medium and the substance that have certain properties where most of our perception is focused and most of the action takes place (Gibson 1979, 23). Ingold leans heavily on Gibson's concept of affordances in materials to provide a diluted version of material agency, and in doing so he proposes that it is really the physical concrete properties of matter (and not some abstract idea about agency) that create the conditions of our engagement. But just as Gibson realised affordances are as much a physical feature of the environment as they are a psychical behaviour of an agent, Ingold too realizes that affordances do not exist prior to a consideration of the subject or nature of the agent.

Gosden opens up a nuanced middle ground. He says: "objects can be seen to be active, but they are active in the manner of objects not in the manner of people" (2001, 164) and points back to Gell's (1992, 1998) work, which crucially shifts the focus of agency, away from an interpretation that revolves around intention and action towards one that is about the formal qualities of objects and the effects things have on people (Gosden 2001, 165). Malafouris says: even if we draw on metaphoric logic in a fetish-like behaviour, "methodologically speaking, it is more sensible and productive to treat material things as agents (and be wrong) than to deny their agency (and be wrong)" (2013: 134). This shift can be productive for striking a balance between the strong version and the diluted version of agency and help bring us back in touch with and

[22] A familiar complaint that is also echoed by Descola when he says Peircian semiotics is "massively occupying the front scene."

understand how the *qualia* of objects matter and how these texture the memories that flow from our sensory engagements.

2.54 Agency, affordances, and memory

In the previous section on situated and embodied and enactive cognition I outlined a variety of ways the extended and embodied mind is capable of offloading and scaffolding with physical and material resources to support memory. Now I will re-visit the subject of memory to outline how it can be re-conceptualized with the theoretical implications of material agency. Because of the way materials are imbricated and actively participate in cognitive and social spaces, technology can no longer be considered as a passive external storage device that humans have cleverly figured out how to exploit. Afterall, the functional peculiarities of objects do not just serve our own intents and purposes. As Malafouris says: materials or people do not merely contain encoded memories or information; rather they "engage memory according to the interactional properties which they afford to particular actors in particular settings" (2004, 56). With material agency, the whole system of remembering is enacted according to the interactional properties that are afforded to the limits of our perceptuomotor abilities. It is a mutually co-constitutive relationship that is always negotiated with constraints.

Studies on materials agency and memory typically approach the subject as something that is literally interwoven into the fabric of things, which tends to evolve into "peculiar cognitive biographies of certain objects" (Sutton, 2008: 45). This bibliographic approach exemplified by the work of Tribble (2005) on mnemonic objects and rituals in modern England, and by the work of Stallybrass et. al. (2004) on re-writable writing tables in the 1500's, is influenced by distributed cognition of Hutchins (1995), where "neither the information nor the sequence of actions to be

remembered need be explicitly represented anywhere"[23] and by the parity principle of the extended mind thesis of Clark and Chalmers (1998), where these objects function virtually in the same way as biological memory (Sutton, 2008: 45-46). As Renfrew puts it, this approach focuses on "the deliberate communicative or mnemonic role of some classes of artefact" (2004:29). Donald's influential work suggests that the significant increase in material culture since the Paleolithic was leveraged as an external symbolic system that provided an ever-increasing exographic storage system that was more durable, retrievable than human biological memory alone. However, this doesn't explain non-symbolic roles of artefacts or do justice to their dynamic interactional qualities. Although these textual accounts are wonderfully rich, and attend to the interdependent mnemonic psychophysiological relationships between people, cultural objects, places, and landscapes (see also A. Jones, 2007) in ways that undeniably and implicitly include a strong element of material agency; they fail to adequately address material agency within the enacted mnemonic operations of practical skill and know-how in the context of our material engagements.

Malafouris argues, that the real achievement of material agency is how when coupled with our engagement it makes it possible for our minds to operate and "*think through things in action"* without having to really remember how to do so at all (2004: 59). In other words, to borrow the terminology from Searle, when our *intention in action* finds a *direction of fit* in the world then practical skill memory are generated on the fly. These become inseparable, simultaneous and reciprocal, where doing *is* knowing, without having to retrieve external exograms, procedural templates, or any such internal mental schemata. Even Connerton recognized this in what he called "habitual skilled remembering" as "sedimented, or amassed, in the body" where we can remember how to swim, for example, without consulting a mental picture or having really to

[23] Though this seems like it is a direct statement against representationalism, it is also very astute in pointing out that we need not look for the sequence of actions to be remembered *in* anything, because they aren't spatially located anywhere precisely. MET excels in this regard because it does not reduce memory to its constitutive parts of person or thing or internal or external. It brings about a new ecology of memory that emerges out of the ensemble of sensorial experiences of engagement with materials.

remember how to do it (1989: 72). But Connerton's choice of language is heavily coloured with metaphors about storage models and his study of memory is largely through the lens of social learning with communal corrective behavioural modelling in what he calls *incorporating practice* and *inscribing practice*, which is of the archival type (1989: 72-3). Stevens and McKechnie refer to kinaesthetic memory and thinking in action, but because they study contemporary dance where routines are rehearsed prior to being performed, their position thus straddles both sides of the non-representational / representational divide with one part procedural, implicit knowledge with direct perception and another part declarative knowledge with neural mirroring (2005: 244).

Sutton warns that the idea that practical skills memory as 'grooved embodied engagements in material culture that are entirely independent of explicit memory' presents a particular challenge for researchers because this implies that skills memory remains obscure and "consciously inaccessible" to the skilled practitioner and to the observer (Sutton, 2008: 49). Using the example of the potter Malafouris says: "No one – not even the potter himself – can have access to this type of information […] Potters know more than what they can tell or explain and their hands often have reasons of which their mind is not aware and which the clay may resist or accommodate. Verbal descriptions, however detailed, can hardly capture the phenomenological perturbations of real activity and the reciprocality between the crafted and the crafter." (2008: 21) In other words, nondeclarative embodied remembering operates before and on a more primordial level than declarative memory. Declarative memory after all, depends more on our ability to exercise discursive practices and narrate episodes of content from the past (Hutto & Myin 2017: 205).

The problem that arises is if we try to access it by being reflexive about it we defy the whole premise of our theoretical commitments, which rejects the dualism of declarative memory being the instigator of perceptuomotor activity. And yet to cut off explicit memory from its embodied origins would again be falling into the trap of the separating reason from embodiment. While this points more to the limitations of ethnographic interviewing it also brings methodological traction

to turn our inquiry towards cognitive ethnography that is immersed in apprenticeship so that we may include the embodied knowledge in the skilled production of artefacts as part of evidence of procedural memory, a call which is supported by Malafouris (2004, 2008, 2013); Sutton (2008); and Marchand (2008, 2010). Yet there remains a real possibility that what is to be understood about skill memory will never betray the agentive voice of the materials, which continue to express themselves outside of intelligible human language and on their own terms.

With material agency, skills memory itself is an elusive and transient interactional go-between property that is not quite fully embodied within the physical nerves, muscles and flesh nor is it found within the physical creations of the apprentice, but rather emerges through our engagements as activities in a particular context. It might be possible to gain oblique still-shots of its pragmatic effects in the world by an assessment of competencies in skilled performances, but a part of it will always remain elusive to recovery through modes of inquiry that illicit propositional thinking or reflexive speech that are antithetical to the terms of material agency, which are based in the lexicon of the very practice itself.

2.6 On perception, the Senses, and Memory

As in the previous sections, I begin with a brief example of how an intracranialist view of perception is restrictive. It is striking how in archaeology and in cognitive sciences (even within the embodied branch) there is actually little consideration given to how the senses mediate the relationship between the consciousness of ideas and the world of objects. Even in neuroscience in clinical laboratory settings the brain cannot be studied on its own - external stimulation in absentia. Research participants in laboratory settings are often sandwiched between and wired in to machines while they are asked to perform perceptuo-motor tasks. They push and pull leavers, press buttons, get prodded on rubber limbs, and are shown objects or images of objects, and still as much as "*the senses are everywhere*" (Bull et al, 2006: 5) they are mostly accounted

for nowhere. It appears that sensory perception is so familiar that it is taken to be self-evident. Yet paradoxically the cognitive implications to reach, to touch, to hold a tool in our hand, to feel its weight, the texture of its surface, its temperature, and to mobilize its use in a coordinated effort, has managed to escape much of our analytic efforts (Malafouris, 2004: 53). The senses, as conventionally conceived, are thought of as natural faculties and passive recipients of data (Classen, 1993: 2), dichotomously caught between an externalist view of the world and an internalist view of cognition. The fact that the senses have been disposed of on the periphery of a biologically bound nervous system, means that the very notion of there being such a thing as 'sensory intelligence' begins from a theoretically marginalised position. Take for example an account of sensory perception by Hughes (2001).

> The events that culminate in perception begin with specialized receptor cells that convert a particular form of physical energy into bioelectric currents. Different sensors are sensitive to different types of energy, so the properties of the receptor cells determine the modality of a sensory system. Ionic currents are the currency of neural information processing, and current flows that begin in the receptors are transmitted through complex networks of interconnected neurons and, in the end result in a pattern of brain activity we call perception. (Hughes, 2001: 7)[24]

This retraction of the senses reduced to patterns of measured brain activity is common in neurobiology and psychology who were taken as the authorities on matters of the senses. Sensory research is often further constrained by the belief that there are just five senses, vision, hearing, smell, taste, and touch, and the idea that there is something of a universal natural history about them. However, one of the central tenets of an anthropology of the senses is to consider how sensation is culturally, historically and scientifically constructed and as well as biologically determined (e.g. Classen, 1993; J. Day, 2013; Feld, 1982; Howes, 2003; Jay, 1993; Levin, 1997; Stoller, 1989). In western culture, it was not until the middle ages that five was settled upon as the number of human senses, owing to a tradition that followed forward from Aristotle who

[24] Quoted in Howes & Classen (2014: 153-4).

wanted them to neatly align with the elements of, earth, air, fire, water and quintessence (Classen, 1993). Sensory engagement, once inseparable from matters involving supernatural powers and magic, has been gradually redefined to fit the script of psychology and neuroscience. As Howes remarks: "This extended, or *holistic* understanding of the sensorium is now lost. It was submerged, if you will, as a result of the retreat of understanding of perception to a place inside our heads" (2017: 1).

2.61 Ocularcentrism

In this next section I outline one of the main concerns of sensory anthropology, which is the problem of ocularcentrism. I then provide a hermeneutic sketch of the evolution of the treatment of the senses in Ingold's (2000; 2007) work, which not only provides an argument against visualism, but also lends itself well to a discussion about the challenges that the privileging of the sensory mode of sight pose to empirical research on memory.

Sensory anthropologists trace the origins of the ocularcentric paradigm back to classical philosophy, where the conceptualization of the sensory mode of sight was seen as metaphorically synonymous with knowledge, rationality, truth and intellect (Blumenberg, 1993: 31; Classen, 1997: 405; Pallasmaa, 2005: 15); and to the philosophy of Descartes with the "downgrading of all things corporeal in contrast to the primacy of the mind" (J. Day, 2013: 4).[25] The emergence of the primacy of vision is linked to shifting of Western sensibilities, which sought purification from the proximate senses (touch, taste and smell) in the construction of modernist sensorial regimes (Hamilakis, 2013: 17-24). This devaluation of certain senses in European modernity is thought to be due in part to odour intolerance, which became a defining feature of distinction for social status (Hamilakis, 2013: 19). Corbin speaks of 'the privatisation of bodily encounters' in bourgeois

[25] The intellectualization of vision was helped along by the invention of scientific instrumentation, such as the telescope, the microscope and cameras (J. Day, 2013: 4).

society, where respectability meant that one should only be familiar to their own personal body odour and not subjected to the olfactory arenas of others (Corbin, 1986: 158), while Classen offers that foreign smells in colonial imaginations began to define the otherness of ethnicity, which were considered primitive and needed to be civilized, deodorized and cleansed (1997: 405). Only light delicate smells such as those that emanate from flowers, perfume or the culinary arts were deemed acceptable (Classen 1993: 15-36). In the Pasteurian revolution, anything derived from the body that was animalistic was not only associated with peasantry but also disease (Hamilakis, 2013: 19). Shusterman concurs, in developing a theory about body consciousness – *somaesthetics*, he says in the West there is a prevailing association of the body with what is negative, bestial and unholy (1999; 2012).

Malafouris suggests that we should try to "go deeper into the phenomenology of human perception by asking some more basic and perhaps slightly more difficult questions" (2013; 196). Yet even when this is explicitly attempted it is often only done from the standard five modalities within Western frameworks, which continue to privilege vision (and to some extent hearing) as the noblest of sense over gustatory, olfactory, and haptic. This is apparent in Gibson (1966, 1979) who would like us to consider the senses as perceptual systems, yet restricts most of his understanding with analogies to models in optics and the visual world. This is also apparent in Ingold's earlier research, in "Perception of the Environment" which opted to leave out a more comprehensive analysis of the ways people perceive the environment by emphasising vision, hearing and movement (2000: 243-288). [26] (*cf* Noë 2009: 130-1). Despite well articulated arguments to consider kinaesthesia, synaesthesia, or speech as a candidate for the 6th sense, and others who posit more radical suggestions that there are at least 10, 21 and maybe 33 separate senses in humans (see Howes 2009: 22-25), much of the focus nevertheless remains on vision.

[26] In "Perception of the Environment," in spite of being well aware of the critiques in sensory anthropology and aside from a few mentions of taste and smell when he retells childhood memories with his father who was a botanist, Ingold is dismissive and says: "Taste and smell raise a whole gamut of problems of their own which lie beyond my present concerns, and while I admit that they would have to be included in any discussion of human sensory experience that claimed to be truly comprehensive, I do not intend to deal with them further here" (2000: 254). n

Ingold's critiques are also situated within an attack on modernity but for him the increasing intellectualization of knowledge brought with it the devaluation and de-skilling of people. Ingold offers a counter argument and explicitly rejects the suggestion that an obsession with sight has led to the dominance of objective thinking in the West (2000: 245). He says, rather it is the inverse and that the modernist project of objectification has co-opted vision to its service by reducing it to a 'faculty of pure reflection delivering things to our consciousness' (2000: 253). Ingold agrees with Fabian (1983: 123) on 'cognitive style' –that gives rise to a prejudice of certain kinds of perceptual experiences.[27] However, he is critical of the "rhetoric of visualism" and chastises sensory anthropologists for trying to erect an antivisualism, which in his opinion, risks re-objectifying and conflating the other senses to the disproportionate levels of vision in the original regime they ostensibly set out to correct (2000: 282). He defaults to a biological deterministic position on perception when he suggests that it would be more fruitful to investigate how an individual's sensory skills result from practice and training in a particular environment, rather than subject "human nature to social conditioning" (2000: 183).[28]

Years later, Ingold changes course and offers a more sensible piece about the world as perceived through the feet, in which he acknowledges the cultural bias against the 'lower senses' and makes more room for ways of being-in-the-world that include non-visual modes of environmental perception (2007: 33-50). Engaging in a deeper phenomenological analysis of touch, Ingold provides a clue as to why touch may have been overlooked, he says: "Dirt is the stuff of tactile (and of course, olfactory) sensation" (2007: 42). His discussion of locomotion bears remarkable similarities with Fabian's *visualism* when Ingold says destination-oriented travel "encouraged the

[27] Ingold concedes that the West heap a disproportionate amount of value onto the visual aesthetic, but his position is that we are never suppressing other (physiological) channels of sensation (ie: people use all their senses all the time). Rather he says it is due to a particular 'cognitive style' (ie: our ways of thinking about and expressing our experiences in the world to one another) that is couched in visual metaphors.

[28] At times Ingold's dismissal of sensory anthropology sounds like he is talking past those who he criticizes looking for something to argue about. He could have weighed in, for example, on the commensurability of his version of sensory enskillment has with Jackson, who also cautions that we should not "force the diversity of experience to be at the disposal of ideas" (1989: 5). His discussion of how sight and hearing work together to inform each other – in a process called synaesthesia- is also very much in line with approaches in sensory anthropology yet he carves them out, refusing to concede to the merits of the argument that the senses are as much 'given' as they are a social construct, and he draws instead on the earlier work of Merleau-Ponty and Gibson for their mention of 'synergic systems' to support a multi-channel, cross-modal analysis (2000: 268-9).

belief that knowledge is integrated not along paths of pedestrian movement but through the accumulation of observations taken from successive points of rest" (Wallace, 1993 quoted in Ingold, 2007: 45). To compare, Fabian's *visualism* is the reduction of the act of knowing to what is observable from a distance (1983). Jackson (1989) says this fixed, detached perspective privileges knowledge gained through sight and alienates our conceptual realms from the sensations and everyday lived experiences that they are supposedly based. In the end it is apparent that Ingold does indeed eventually warm up to the sociality and enculturation of the senses and is coming to terms with the problems the visual bias he presented in his earlier empirical research. His chapter about the world as perceived through the feet is a concession that the continued reification of the dominant modernist discourse that produces knowledge as a function of what meets the eye, can no longer stand on its own.

It is within (and up against) these discourses that the project of sensory archaeology operates. The contentious issue is the extent to which pre-conceived notions about human nature obscure the diverse ways that materials give rise to a cornucopia (full range) of sensations. Gosden recognises: "Each culture creates its own sensory environment, both physically through constructing a material world with its own set of sensory properties and culturally through emphasizing and valuing certain types of sense impressions over others" (2001, 166). A better understanding of the sensorium will have profound implications for how archaeologists study and analyze the role of materials in supporting memory.

2.62 Towards a sensory archaeology of memory

Sensory archaeology developed both independently and as a branch of sensory anthropology. The sensory turn in archaeology highlights the need for theoretical approaches that can apply the multi-sensorial experience to questions about human existence. Some pioneering works include Christopher Tilley's (1994) Phenomenology of Landscape, which attempts to reconstruct

sensory perception through a phenomenological analysis of embodied awareness of movement linked with the landscape of natural features, pathways and monoliths. Other pioneering works include "An Archaeology of the Senses" by Robin Skeates (2010) who details the sensory affordances of materials with a mixture of Geertzian thick description as a means of trying to reanimate the sensorial phenomena of the past; A panel of papers presented at a conference organized by Jo Day at Southern Illinois University in 2010 and published under the same title: "Making Senses of the Past" (2013); Hamilakis (2013) offers an 'undisciplined discipline' and outlines a framework of sensoriality for archaeology that "should not be on individual sense but on the field of sensoriality and on the affective and mnemonic flows it engenders" (2013: 14); And a group of archaeologists at Global South led by José Roberto Pellini, who collectively stress the importance of decolonizing the senses and the discipline (Pellini, Zarankin & Salerno, 2015).

Attempts to rectify the visual bias have led to a rise in archaeological research that focuses on the non-visual dimensions of sites and artifacts. This produces works that explore the soundscape and the archaeoacoustics of past places and activities no longer practiced (e.g. Watson & Keating, 1999; Kelman, 2010; Primeau & Witt, 2018); or investigations of the texture of materials like clay pots or the tactile properties of certain labours like rock carving (e.g. MacGregor, 1999); or the tastes (and by close association, smells) of eating traditional foods (e.g. Hastorf, 2017); or stench of the battlefield and ancient city smellscapes (e.g. Derrick, 2017). The critiques of the multi-sensorial approach (some well deserved, others less so) tend to be three pronged and can be summarized as follows: 1) they enumerate the senses separately and even when part of a consortium of essays on the sensorium this singular focus fails to utilize a synaesthetic framework as the basis for all sensorial perception[29] 2) they continue to uphold the Western sensorium of five senses even when being explicit about trying to avoid this dominant scheme and 3) in some cases they assume rather unproblematically that prehistoric peoples had similar sensory

[29] Ingold would agree and in some of his later work he weighs in by saying he welcomes the development of the senses in research but he deplores discrete approaches to the sensory experience. (e.g. "soundscape" (Ingold, 2011) and "lightscape" (Ingold, 2013)). He says the *scaping* of the prototypical concept of Landscape slices up sensory pathways into artificial cultural and corporeal categories that are nonsensical to the way sensory registers cooperate together (2011: 137-8).

apparatus (and values) as modern people (e.g. Tilley, 2012: 485). All three prongs are also related to the more general failing to be reflective about our own sensory constitution as practitioners within Western modernist archaeology.[30] Fortunately, we can learn from past mistakes, or at least chart a course forward that is not inconsequential.

I use a synoptic sketch of Ingold's earlier work as a prime example of a missed opportunity to include an appreciation of the senses (other than vision) as an integral component of how people become skilled. For such a seminal work on the perception of the environment it was a significant oversight. Touch is central to the ways we come to understand the environment that surrounds us but it is also central to the ways we remember it (Nabeta & Kawahara, 2006; Spitzer & Blankenburg, 2011). To rephrase this in terms of Clark's complementary surrogates; the reason why surrogates work so well is not just because they ground distal abstract ideas in the materiality of objects, but also because those objects can be sensorially engaged with and become an intimate part of our lived experience. Thus, making the physical thing that some memory theorists on the representational side of the camp believe stands in situ of ideas more accurately allows for ideas to emerge when being haptically explored (or by a combination of other multimodal sensory channels). Haptic memory is intimate since textural experience requires physical contact with the surface of the skin in ways that iconic (visual) and echoic (auditory) memory cannot afford.[31] The same can be said about olfactory and gustatory memory, which are arguably the most intimate of all. Air being vital to life carries scent inside our body filling our lungs with each breath and the food we eat is brought onto our palate before filling our bellies.

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[30] Further problems arise with how to express the sensory knowledge that is produced by our research and what ways are best suited for sharing it with the academic community and the greater public. Some have turned to multimedia as a way to off-set the limitations of textualism (see: Cox, Irving & Wright, 2014; McLuhen, 1962; Taussig, 2015) while others have gone even deeper into (auto)ethnographic narrative. There's also been a revival of experimental archaeology, which attempts to excavate the sensorial experience and bodily happenings with materials and the environment (e.g. Gheorghiu, 2009) –I will address these considerations more properly in the following chapter. Suffice to say my methodology with research creation leans heavily on the experimental and creative approaches in anthropology.

[31] This also explains the reason why pedagogical exercises in math still haven't given up on the use of geometric forms, colored sticks or beads to give manipulable shapes to the working of abstract concepts and ideas.

It is not just the aspect of intimacy per-se that is most compelling for the implications of the tactile on memory. Recent studies in neuroscience show that visual stimulus hinges on topography such that people often fail to recognize the same stimulus pattern when it is presented in different spatial localizations (Dill & Fahle, 1997, 1998). It appears that our brain's neurons commit to specific retinotopic information, which makes it challenging to transfer a visual experience from one context to another (Ahissar & Hochstein, 1997). Haptic memory does not suffer from this limitation (Harris et al., 2001). According to Klatzky et al. (1985) our cutaneous mechanoreceptors are highly adept at recognizing tactile stimuli even when they occur at different locations and in unexpected contexts (see also Connor & Johnson, 1992).[32] While the tactile and the visual systems can and do operate independently, they mostly work together to inform about weight, texture, temperature, pressure, luminance, color, movement and depth. This convergence of modalities is what makes it possible to form mental images of objects that are being haptically explored without ever looking at them (Gadelha et al., 2013; 132).

Lacey and Campbell (2006) found that in cross-modal tests the haptic condition presents better performance for encoding familiar objects and remembering them over longer periods of time (also Pensky et al. 2008) whereas visual recognition remains much faster and more accurate than unimodal haptic recognition for encoding unfamiliar objects (Bushnell & Baxt, 1999; Martinovic, et. al., 2012). In isolation it is auditory memory that has the lowest performance, with olfactory and tactile systems being about equal when tested against the superposition of vision (Gadelha et al. 2013). But our bodies attend to the world through the senses in complex ways, more often in combination and rarely (if at all) use the senses singly. Perhaps unsurprisingly the highest performance for memory -and thus to employ Glenberg (1997) version, which is the ability to

[32] For example, think about running into a colleague or familiar face in another part of the city or halfway around the world when you are least expecting it and saying hello to each other only to realize who that person was moments later after they have passed you by. Now in comparison think about touching different textures unexpectedly out of context perhaps something slimy or wet on the furniture that you didn't see beforehand, or something coarse, or soft like fur. Our haptic sense is not infallible but is less likely to be caught off guard in novel contexts. These studies suggest that haptic memory presents many advantages over visual, auditory, and other modes.

recognize and encode possible patterns of physical interaction with the three-dimensional world, is achieved when the senses are considered together. And despite of all the measuring and interpreting that goes on in the psychology laboratory, there remains a dearth of understanding about the role of the senses on mnemonic processes in cross-cultural settings. For this we must turn towards ethnography.

In Hamilakis' version of sensorial mnemonics, things are conceived as bundles of "sensuous properties of matter" whose qualia give meaning and memory to our relationships with them (Hamilakis, 2013: 21). In this alternative conception Hamilakis attempts to lay the groundwork for a new ontology of memory that lives in the "sensorial assemblages." He attempts to reconceptualise memory by shifting it from corporeality to sensoriality. Here remembering emerges from sensorial fields of mnemonic flow (2013; 115-6). Borrowing from the Bergsonian (1896) view of a materialized memory that is multi-temporal, Hamilakis develops memory to be at times durable hinging on more stable material memories and at other times fragile cutting across distinct historical situations. He says: "Past and present thus are not successive moments in a line but rather co-exist side by side, in the same way that every sensorial perception is at the same time past and present" (2013: 122). With this polychronistic interpretation of memory Hamilakis is referring to many bundles of simultaneous relationships. 1) The durational properties of materials, which carry forth to the present moment the memories of times since their origin. 2) The contemporary memories created in the moment the thing itself comes into our circle of sensorial attention, (which is also a way of saying the memories of 1 & 3 combined). 3) The memory of perception that we have come to know through all other previous sensory experiences. Hamiliakis' multi-sensory approach to memory is thought provoking, and he does attempt to develop other senses beyond the standard five, with a sense of place, the sense of intoxication, and the sense of time. However, I am unconvinced that multi-temporality is as radical a departure from chronological notions of time as Hamilakis insists. While the notion of the co-mingling of tempo-sensory memories is highly enticing, it fails to develop the material aspects of memory beyond the lines of what has already been presented in the archival method. The weakness becomes even more apparent when considering raw materials, which have yet to

been transformed by past human activity. What memory then do those carry forth? - Except a wide range of open possibilities for affordances that mingle with the memory of the accumulation of our personal past sensorial experiences, his theories remain mute of these crucial aspects, which I shall develop throughout my thesis. He does provide a helpful analogy for thinking about how memories of different timeframes are superimposed and he highlights the importance of exploring the role of materials in giving meaning to the sensorial texture of perception and how memory flows from these experiences.

It is with the concept of synaesthesia that we are pointed towards a way of studying how the senses are joined and the multimodal ways they work together to inform how the whole body perceives (Ackerman; 1990). It is with this approach to inter-sensory connectedness that Sutton urges us to consider skilled practices as facilitators of memory (D. Sutton, 2001). To be more precise, he suggests that our understanding of procedural and episodic memory could be improved by investigating synaesthetic borrowing - the congruence of sensory modalities based on the register of a sensory signal from one mode and the transfer to another.

Indeed, it is this kind of cross-modal synesthetic connections that are evoked when Indigenous canoe builders uses the linguistic metaphor: "listen to the wood." Perhaps the more difficult deeper and phenomenological questions that Malafouris suggests could be posed within a Material Engagement paradigm. For instance, what are the implications for cognition when the powerful auditory guidance system is elicited in our haptic routines and the 'verbal or quasi-verbal instructional nudges' are deferred onto the materials? [33] The Elder's folk wisdom is compatible with the studies that suggest auditory memory has the lowest level of performance, but that's really only half the story when tested against the auditory memory's ability for recall. To be certain, wood emits sounds when being worked. In canoe building wedges are pounded into the base of a felled tree, which gives off acoustic notes that climb in pitch as the wedges are

[33] Sudnow uses the term 'instructional nudges' to describe shorthand cues that have condensed practical wisdom. These aren't quite instructions with explicit content but are "caretaking practices" for reshaping and toning our grooved embodied routines (2001: 127-9).

pinched tighter and driven deeper until the wood gives way to a more sustained crack that audibly creaks as the split travels along the grain the whole length of the log. The sense of hearing can also be adapted as a diagnostic tool that alerts the craftsman well in advance of the first visual signs of an imminent problem such as, when our tools are met against embedded branch knots or irregularities in the grain. But I suspect the Elder's instructional nudge is the humble acknowledgement that multi-sensorial engagements with materials is ontologically generative for memory in a manner that is much more effective than listening to anything an old person could ever say. Words of advice received by the ear would be committed to semantic memory and thus be vulnerable to poor mnemonic performance. The implications for cognition are that when we attune our ears to the wood; our hearing is elicited for guidance in our embodied routines. We are no longer using our hearing for semantic memory, but instead for the coordination of balance and activity in manual tasks, which develops skills knowledge within a more stable and long-term development of procedural memories.

As cognitive archaeologists, we are in a privileged position because with a particular focus on materiality (as opposed to modern psychology), we can move mainstream theories of memory beyond the internalist conception of the mind that have insulated knowledge from the panoply of sensations that arise from the land and our material engagements.

2.7 Conclusion

Archaeologists are well acquainted with the processes of erasure and the fragmented remains of times long past. In the context of research involving Indigenous people living in the ongoing processes of colonisation in Canada, the Algonquin's histories include dispossession, both of land and of belongings. There is rupture in cultural knowledge, in access to heritage, and in family and community. The need for new theories about memory takes place in this context of discontinuity in the shadow of trauma that comes from surviving a colonial regime's destructive mechanisms

that deliberately sought to extinguish, erase and supplant the rich collective memories with a new monolithic social order. Though it is fragmented, the source of their knowledge remains in the connection with the spirit and the land. It is under these circumstances, of non-consensual disruption, that necessitates novel approaches to remembering.

Standard theories of mind have been largely constrained by intracranialism. As this chapter demonstrated, this trend is pervasive and evident in conventional cognitive theory, in material culture studies and the treatment of the senses in empirical research. Although more recent attempts have been made to radicalize these frameworks (4E cognition), they continue to receive marginal attention. Studies on memory are further limited by the usual inductive logic that necessitates a direct lineage of physical and psychical mediums. Multi-species dimensions pose new philosophical questions about how these dimensions work together with landscape and raw materials to transmit culture -even with generational gaps over vast periods of time. I will call this transgeneration memory. Without swinging too hard into the polemic nature vs. nurture debate, there's much needed and interesting research potential that seizes upon the analytical powers of a Material Engagement approach and that follow through on the theoretical commitments of an extended, embodied and enactive mind. Afterall, if the structures of the mind are deeply coupled with the environment (and have been for generations) then there is hope that these structures may be re-animated by engaging in a particular kind of attunement to the affordances of materials. This notion is possibly supported by embodied theorists who associate procedural memory with ecological approaches and notions of *offloading* cognition, a technique that enables the mind to think through things in action without having to process or take onboard immense amounts of information. Indeed, several theorists in cognitive sciences (e.g. Brooks, 1991; Clark 1997), posits that everything a human cognizer needs to know is already out there in the environment. In theory, our epistemic actions should be able to alter the informational character of the environment to reveal to us what it is we need to know. To swing the pendulum back the other way around towards culture side and shift for a moment towards metaphoric logic, we, as anthropologists should take seriously Indigenous worldview, that the living spirit of the forest can also be considered as a mnemonic device. As I shall present throughout my thesis,

the Algonquin believe that spirits guide and teach people particular action routines and to develop grooved habits manipulating natural materials out on the land that follow very much in the footsteps of their ancestors. My goal in this thesis is to bring these often distinct categories of nature and culture together as one. This scenario would enable people to think about the extended mind through *offline* cognition and in surrogate situations, not in the archival sense, but rather as the embodied and enactive generative process of creative remembrance at work in the present moment. The realm of engagement in a unified physical and psychical world plays out well in multi-species ethnography and in Indigenous worldview and can be tremendously helpful for people who endeavour to overcome the problem posed by trace theories of memory, which seemingly require a direct lineage of personal experience or human-made material evidence.

In using MET I am developing an innovative framework for a holistic approach to investigating how natural resources in landscapes matter for the continuity of cultural memory. The hope is that I have laid the groundwork and put into place a coherent map that will be useful for the synaesthetic tracking of the activities that are at the core of this research project. I have brought together diverse models from a variety of fields into this relatively unchartered interdisciplinary territory. It combines the strengths of embodied cognition, materiality and sensory studies, but also brings with them some of their weaknesses. It invites readers who might be interested in a wide range of topics such as, archaeology, cognition, epistemology and post-colonial acts of cultural recovery, to take a leap into new notions about how one makes sense of their own environments, and to imagine the impact of materials on cultural revival in other cross-cultural situations.

Chapter 3

Cognitive Histories and Harvest in Colonial Landscapes

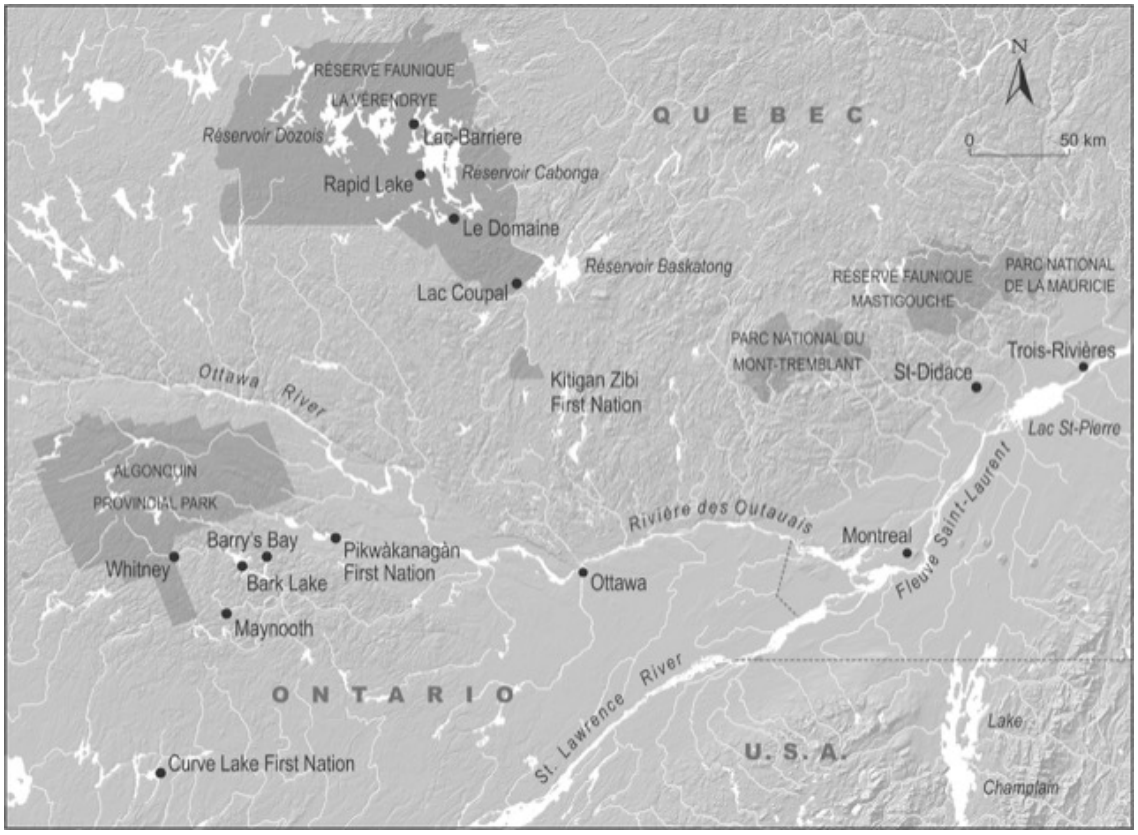

Fig. 11. Map of Bark Territory

3.1 Introduction

The first tenet of MET -an extended mind- implores us to consider the inseparability of mind and matter and to include the extra-neural networks of our material surroundings as constitutive of the mind's cognitive apparatus. In effect, MET recasts cognition beyond the bounds of the brain to consider how the mind is emergent through our material engagements. Within a MET framework the material environment is not just mere backdrop or context in which living and cognizant organisms are embedded, but rather material things are understood as having agency to shape the way cognition emerges through the mutually enactive process of our engagements. In this chapter I use a Material Engagement approach to consider how natural resources like rivers and forests are vital to supporting memory not merely by virtue of the ways in which people

are embedded and engaged with these environmental resources, but more-so when things like rivers and forests are themselves take to be constitutive and equal agents in the processes an extended mind remembers.

As you may recall, in the second chapter, I reviewed how humans use external resources to 'offload' cognition and use the material and spatial environment to perform memory tasks (Brooks (1991); Hutchins (1995); Hutchins & Klausen, (1994); Kirsh & Maglio (1994); Malafouris (2013), (2019a); Malafouris & Koukouti (2018); Sterelny (2004); Sutton (2008), (2020). In this chapter I begin to chart the resulting loss of cognition when external resources are taken away. The crux of my argument is this: if indeed the lived environment is so deeply integrated with mind and memory, then the displacement from and the destruction of traditional Indigenous territory are not merely experienced as ecological or material loss but also a substantial and irreparable loss of cognitive resources as well. The aim of this chapter is to reframe how the lived environment has habitually been understood as something that is external to the human mind and consider for a moment that it is very much a part of it.

First, to grasp how the erosion of cognitive faculties occurred through colonial dispossession I provide an overview of early historic contact period with the Algonquin as it was recorded both by Europeans as well as by Algonquin *Wampum* and oral history. Next, I draw on my fieldwork as I, along with Algonquin canoe builder Chuck Commanda, bring the reader along with us into the forest on the edges of the Madawaska watershed in search of birch bark. This ground-up approach aims to uncover just what exactly 'territory' and 'birch bark' mean for human memory in practical terms and in terms analogous to the theory of the extended mind. Together, we investigate *how traditional territories connect the Algonquin with the extended cognitive ecologies of ancestral knowledge of canoe building.*

I use MET from the theoretical vantage of an extended mind along with historical and environmental storytelling, to reflect on what it means to harvest bark in this particular place and time where the ecologies of the forest can be immediately sensed, but also on the ways the colonial landscape has drastically mediated the embodied and cognitive memories of Indigenous canoe builders who endeavour to follow in the footsteps of their Elders.

3.2 - Early contact period: 1500 to mid-1600

In the early 1500's Basque, and Breton fishermen and whalers came to the coasts of Newfoundland and the Gulf of Saint-Lawrence to hunt whale. Meanwhile, in the second half of the 16th century European beaver were becoming virtually extinct from overhunting and were a hot commodity on the European fur market. While the English and the Dutch already controlled much of the trade with the Russians for continental beaver, the French saw an opportunity to establish a fur-trade with the Indigenous people of North America. Encounters between Europeans and Indigenous people gradually gave way to an increase in trade for furs and hides. Jacques Cartier provides one of the earliest recorded observations of bark canoes. On the 12th of June in 1534 after having met another ship from La Rochelle about 100 miles West of Belle-Isle off the coast of Newfoundland, He notes: "Ilz ont des barques en quoy ilz vont par la mer qui sont faictes d'escorche de bouays de boulo quoy ilz peschent force loups marins."[34] In 1535, on his second voyage, Cartier documented his visit to Hochelaga, a fortified (Iroquoian) village, located on the island of present-day Montreal. He observed: 'approximately fifty long houses, about 50 paces long by 12 to 15 paces wide, made of wood and covered with large tree bark that is well-sewn in the local manner' (2004 / 1545: 24).[35] In many respects, canoe technology also shares

[34] Translation: "They have boats in which they go out to sea that are made of bark from trees of birch that they use to fish for seal." June 12th of Cartier's first voyage puts him in the area of Belle Isle around the Quebec / Labrador border.

[35] [Translated from original in 1535] « dedans icelle ville, environ cinquante maisons longues d'environ cinquante pas ou plus chascune, & douze ou quinze pas de larges, & toutes faites de boys couvertes & garnyes de grandes escorces & pelleures desdictz boys aussy large que tables, bien cousus artificiellement selon leur mode : & par dedans icelles y a plusieurs estres & chambres. »

similarities with longhouses, where birch bark panels are also overlapped and stitched together and fastened over wooden lattice frames. In 1603, near Tadoussac, Quebec, Samuel de Champlain offers another description of their canoes. He observes: "Their canoes, which are 8 or 9 paces long and about 1 or 1 ½ paces wide in the middle, tapering off at the two ends. They are very liable to upset if one does not know how to handle them, and are made of [birch] bark, strengthened inside with little hoops [of white cedar], very nicely arranged, and are so light that a man can easily carry one of them" (Biggar, 1925: 9-10).[36]

Though the European newcomers had little reason to document canoe construction in any great detail; examples of early contact-period canoes that survive in museum collections and renditions of canoes in art and illustrations indicate that the inhabitants of each watershed built their canoes with slight variation in form and aesthetics, which differentiated their canoes from those of neighbouring peoples. Indigenous men and women applied their hand and left their mark by shaping the prow and stern stems into signature profiles that would have made each canoe identifiable as belonging to a particular band. A keen observer would have been able to see these defining features at a considerable distance on the horizon. Further details such as the manner in which the root lashings were stitched into various patterns in the stems or stylized touches on the headboards, would have made it possible to identify a kind of signature trait belonging to a particular family lineage or individual builder.[37]

[36] [Translated from original in 1603] « Leur canots ont quelques huict ou neut pas de long, & large comme d'un pas ou pas & demy par le milieu, & vont toujours en amoindrissant par les deux bouts. Ils sont fort subjects à tourner si on ne les sçait bien gouverner, car ils sont faicts d'escorce d'arbres appellée bouille, renforcez par le dedans de petits cercles de bois bien & proprement faicts, & sont si légers qu'un homme en porte un aisément. » He later revised this description in the jounrals of his second voyage in 1608, copying almost word for word, except this time he adds that the bark comes from "boulleau" (the proper word for birch tree), not "bouille" as he wrote in 1603 and that interior frame is made of white cedar, which he had previously just said it was made of "bois" wood (1608 (reprint 2005): 290).

[37] None of these details were recorded in any systematic study until Edwin Tapan Adney began to do so from the 1890's to 1940's. His work, which came at a time where ethnographers were invested in salvage ethnography, is widely credited as the seminal research of Indigenous canoe manufacture.

Early recorded history of the fur trade era makes clear that birch bark is a significant resource for shelter and transportation in the material culture of Indigenous people, however, the vast majority of historic accounts from this period merely take stock in the numbers of bark canoes and people they encountered, without providing any further detail about their construction.[38] This is a rather curious omission considering that travel was impossible past the Lachine Rapids (at Montreal Island) in their own ships of European manufacture and partnership with the Algonquin and their canoes 'of birch rind and cedar hoops' were essential for travel further west into the interior of the country.

In 1603, King Henri IV dispatched François Gravé du Pont on a second trade mission to "France Nouvelle." His nephew Samuel de Champlain accompanied the mission as an observer and cartographer to 'make a faithful report of all that I saw and discovered' (Bourne, 1904: 52).[39] On the 27th of May at St. Matthew's point, (near Tadoussac) they were received by Anadabijou, a Montagnais (*Innu*) chief, who was celebrating with a group of 80 to 100 Algonquin and Maliseet (*Etchemin*) men a victorious raid on the Iroquois (*Haudenosaunee*)[40]. Two Montagnais men, who

[38] In 1605, in northern Massachusetts, (at the southern limits of the white birch habitat along the Eastern Seaboard) Champlain, provides an unusually descriptive record of the harvesting of a tree and hollowing it out for a dugout canoe. Sadly, he did not record the construction of birch bark canoes. Regarding the dugouts, he says: "The canoes of those who live there are made of a single piece, and are very liable to turn over if one is not skillful in managing them. We had not before seen any of this kind. After cutting down, at a cost of much labour and time, the largest and tallest tree they can find, by means of stone hatchets (for they have no other except some few which they received from the savages on the coasts of La Cadie, who obtained them in exchange for furs), they remove the bark, and round off the tree except on one side, where they apply fire gradually along its entire length; and sometimes they put red hot pebble-stones on top. When the fire is too fierce, they extinguish it with a little water, not entirely, but so that the edge of the boat may not be burnt. It being hollowed out as much as they wish, they scrape it all over with stones, which they use instead of knives. These stone resemble our musket flints." [Excerpt from: Champlain's Voyages, Prince Soc. Reprint, vol. II pp. 73-74]

[39] Upon his return to France, Champlain had a small 44-page manuscript published by C. de Monstr'oeil, in Paris Titled: "Des sauvages, ou Voyage de Samuel Champlain, de Brouage, faict en la France Nouvelle l'an mil six cens trois" This manuscript was translated into English by Purchas and republished in London in 1625. It contributed generally to the increasing appetite in Europe for new forms of travel literature depicting real and sensational encounters with Indigenous peoples of North America. More specifically, it should be interpreted in light of the fact that it is as a commissioned work, originally presented to the inner circle of the King's court, intended to present a convincing case that the new continent was rich in valuable resources available to the supply and service of the King should his Majesty choose to fund further exploration and trade missions in New France.

[40] Haudenosaunee literally means "people of the longhouse" – in the 17th century the Iroquois confederacy consisted of Five Nations, the Mohawk, Onondaga, Oneida, Cayuga, and the Seneca. The Tuscarora joined the confederacy in 1722 and the Iroquois Confederacy became known as the Six Nations.

were returning from France with Pont Gravé and Champlain, reported back to the group.[41] Champlain writes: "One of the savages whom we had taken with us began to make an address, speaking of the cordial reception the king had given them, and the good treatment they had received in France, and saying they were assured that his Majesty was favourably disposed towards them, and was desirous of peopling their country, and of making peace with their enemies, the Iroquois, or of sending forces to conquer them. He also told them of the handsome manors, palaces, and houses they had seen, and of the inhabitants and our mode of living. He was listened to with the greatest possible silence" (Slafter (ed.), 1880: 236-7).[42] Anadabijou, then proceeds with a *tabagie* ceremony whereupon he shares some tobacco with the French newcomers and the men who were seated in rows on both sides of the long house. "After a long smoke, he began to make his address to all, speaking with gravity, stopping at times a little, and then resuming and saying that they truly ought to be very glad in having his Majesty for a great friend." (ibid.)

The Algonquin had already been accustomed to trading with the French at their early outposts in Tadoussac, Quebec and Trois Rivières and they most likely encountered Basque and Breton fisherman who already frequented the St Lawrence estuary for over a century (Biggar, 1901:

[41] In 16th century Europe, it was fashionable for royalty and noblemen to keep Indigenous people in their entourage. The first record of Indigenous men being brought from Canada comes from The Chronicle of Robert Fabyan in 1498: "Thys yere also were browgth unto the king iij men takyn In the Newe ffound Ile land, that before I spak of In wylliam purchas tyme being mayer, These were clothid In bestys skynnys and ete Raw fflesh and spak such speech that noo man cowed undyrstand theym, and In theyr king kept a time after. Of the which upon two yeeres past after I saw two apparelled after the manner of Englishmen, in Westminster palace, which at that time I coulde not discern from Englishmen, till I was learned what they were. But as for speech, I heard none of them utter one worde." Fabyan mentions the three men were brought from Newfoundland by a 'Venetian' and though an original copy of The Chronicle does not survive, it is Stow's *Chronicle* (London, 1580: 875) and Hakluyt's *Divers Voyage* (London, 1582 (reprint 1850): 23-4) that confirm the three men returned with Sebastian Gaboto, [John Cabot] on his second voyage in 1498 (in Williamson 1962: 128).

[42] It is unclear which two Montagnais men returned from France with Pont Gravé and Champlain. What is known is that in the year prior in 1602 Pont Gravé presented "several" Montagnais men to Henry IV one of whom was the young son of Begourat, another Montagnais chief. Begourat's son was given as a companion to the dauphin in the Château Saint-Germain and did not make the return journey and died in France, likely of disease, in 1603 (Dickason, 1984: 212).

47).[43] The Algonquin had their own name for European foreigners whom they called the *Wemitigojiwak* (wooden ship people). Champlain recognized that continued patronage with the Algonquin would be indispensable to establishing a French colony. In so doing, the French would also gain access to the existing network of trading partners, which the Algonquin maintained all the way from the Great Lakes region with the *Wendat* (Huron) to the Innu in northeastern Quebec. Champlain possessed a fair degree of military competency through his experience gained as a soldier in the Wars of Religion. Eager to solidify this friendship, when he returned on his second voyage, on July 2nd 1609,[44] he set out with a large group of Algonquin, Montagnais, and Huron on a war party travelling south on the "Rivières des Iroquois" (now called the Richelieu River) deep inside Iroquois territory.[45]

They arrived at a *Kaniatarakwà:ronte* the Mohawk name for this lake literally means wide lake (Champlain later renamed this lake after himself - Lake Champlain). On July 29th under the cover of darkness they encountered the Iroquois at the village of *Ticonderoga.* If Champlain's version is to be believed, both sides exchanged provocations and war cries and agreed to commence battle the following morning at daylight. The Algonquin pointed out the 3 Iroquois chiefs to Champlain and ask him to do all he can to kill them. Champlain brags about how he loaded 4 balls into his gun and with a single shot killed two of the Iroquois chiefs while another soldier injured the third chief with a shot from the treeline. The Iroquois reportedly were confused for a moment at the sight of a white man with an arquebuse (long rifle). The loud bang, white smoke and the sight of their two chiefs suddenly dropping dead sent them scattering in retreat as the Algonquin

[43] French fishing and merchant fleets were already making frequent travels into the St Lawrence. Historian Henri Biggar estimates by 1527 there were more than 50 French, English and Portuguese fishing vessels coming to the St Lawrence estuary each year (1965: 23). In 1560 in Tadoussac, Indigenous people reportedly told Father Charles Lalemant that they had seen more than 20 fishing vessels that year (Girard & Brisson, 2014: 13). And by 1570, Girard and Perron estimate between 350 and 380 European fishing vessels were making the trip each year to the region (1995: 56).

[44] Printed as July 2nd, however, this date is disputed. It is most likely the 12th of July.

[45] Initially 300 men and 9 French soldiers set out in over 100 canoes but most of the warriors turned back upon having bad dreams and visions of an Iroquois ambush. Champlain continued with a smaller party of 2 French soldiers and about 60 Indigenous men in 24 canoes.

rained arrows upon them causing further casualties.[46] There is good reason to doubt Champlain's version of events. First, the arquebuse, a notoriously unreliable weapon, even in the hands of a skilled marksman one would have to be extremely lucky to manage a lethal kill with a single shot. Second, Champlain provides an illustration of the battle depicting Indigenous warriors facing off in western military battalion formation. This is highly irregular, since ambush was the method most often used by Indigenous war parties and it seems more likely if Champlain managed to kill two Iroquois chiefs that it was probably done by surprise or deceit at a much closer range. Whichever the case may be, due to the successful inclusion of French firepower this victory emboldened the Algonquin, but it also sparked the French - Iroquois Wars and provoked retaliation and revenge on a scale that was unimaginable. (Biggar 1925a: 80-107).[47]

In 1613, Champlain travelled past the Lake of Two Mountains (on the west side of Montreal) and up the "Rivière des Algommequins", as he called it, to the main village of the *Kichesipirini* (Big River People) on Morrison Island. Here he met chief Tessoüat and a visiting chief named Nibachis who was leader of the *Outaoukotwemiwek* band that lived on Muskrat Lake.[48] As is customary, they invited Champlain and his party to feast on fish and meat and share in tobacco ceremonies. Champlain was not the first European to visit the Kichesippi river, (Ottawa River). His scout, Nicholas de Vignau, had spent the previous winter living with the Algonquin under Tessoüat's

[46] Estimates are that approximately 200 Iroquois lived in the village and that the Iroquois sustained somewhere between 50 to 100 casualties. A further 10-12 were taken prisoner and tortured in the most gruesome manner imaginable upon their return to Tadoussac - a common practice for the fate of all male warriors taken captive (Bourne, 1904: 214-18). By Champlain's account: only "15 or 16 of our men wounded by arrow shot, who were soon healed"

[47] After returning to France for the winter, the following spring Champlain returns to New France and continues to provide firepower to the Algonquin and help them wage war on the Iroquois once again. On June 14th, 1610, he joins a war party of approximately 400 Montagnais, Algonquin and Huron in another ambush on an Iroquois fortress near the mouth of the Iroquois River taking more hostages and killing approximately 100 men inside (Biggar, 1925:122-133) He suffers a minor arrow wound after being grazed on the side of the neck. On October 10th, 1615, he mounts another attack with 10 French soldiers and 300 Wendat (Huron) against the Onondaga, (one of the 5 member nations of the Iroquois Confederacy). This would be his last offensive and prove unsuccessful. Re-enforcements did not arrive in time. The Huron went ahead with the attack anyway without waiting for the reinforcements. Champlain took an arrow to the knee and had to be carried out of battle during the retreat. He spent the winter among the Huron before being escorted back to Quebec using an ancient portage route near Peterborough that provided a safer back-channel to the more exposed and dangerous St Lawrence River.

[48] Champlain had previously met Chief Tessoüat in 1603 in Tadoussac. The Kichesipirini were part of the warriors celebrating their victory with Chief Anadabijou.

care.[49] Champlain was, however, the first European to record place names, precise geographic and cartographic measurements, and ways of life including mortuary practices and descriptions of gardens with maize, squash, beans, peas and tobacco. Champlain's request to go a further 6 day's journey upriver to see the "*Nebicerini"* (Nipissing) was denied, and so too was his request for an extra four canoes and 8 more men. In his journal he recounts his frustration with Tessoüat who had a premonition and warned him that the path ahead would be perilous; that the Nipissing were powerful sorcerers possessing harmful charms (spells), medicines and herbs (poisons). Tessoüat also questioned the integrity of the Frenchmen considering that de Vignau had lied about having seen the North Sea (the Hudson's Bay) an offence he originally denied, which escalated to a physical altercation until he later capitulated. Tessoüat raised further grievance about Champlain's own broken promises to go to war the previous summer recounting how two thousand Algonquin men made the journey south to meet Champlain and he was nowhere to be found.[50] For Champlain's part he thought there is no harm in wanting to "enter into friendship with them [the Nipissing], so that I might visit the North Sea […] that I desired to make the two tribes mutual friends" (Slafter (ed.), 1882: 73-74) The real reason, which Champlain either willfully ignored or remained ignorant of, was that the *Kichesipirini* lived along the main route between the Atlantic and the interior and they were already implicated in the vast network of inter-tribal trade (Morrison, 2006: 17). The privileged position at Morrison and Allumette islands enabled the *Kichesipirini* to collect a tribute and tolls on Huron canoes loaded with furs passing through the Ottawa River (Dickason, 1984: 109). The Algonquin already had a working relationship with the Nipissing and tried to prevent the French from going to Huronia so as not

[49]Before de Vignau in 1610 a young man by the name of Etienne Brulé, who had already been living in New France for a couple years, requested permission from Champlain to go live among the Algonquin. Champlain arranged a deal with Chief Iroquet, an Algonquin chief of the Petite Nation band to take Brulé for a year in exchange for taking a young Huron man named Savingnon to live among the French. Though there is no record of the exact route Brulé took he very likely also travelled along the Ottawa river. After a year Brulé returned as promised to give his account of what he saw in the interior and was given permission to go back again and this time to live among the Huron. Brulé would later act as interpreter to broker trade deals and teach incoming Jesuit missionaries how to speak Algonquin. To his credit he assimilated well with the Algonquin, living, and dressing exactly as his hosts did. He was the first European to see the Great Lakes. Even though he was offered a comfortable life and position in the French settlements, he chose to continue living among the Huron and Algonquin people until his death in 1633. Brulé did not keep a journal or leave any written record of his travels or life.

[50] Champlain acknowledged his broken promise and said that he had been sent by order of the King to fight other wars.

to upset the existing order of governance and control over the flow of goods and traffic through their territory and into the interior.

"On the 10th of June, much to Champlain's disappointment, his party of 40 canoes headed back towards Quebec. The following day Champlain records a tobacco ceremony that took place at the "Sault de la Chaudière" falls (at Ottawa).

> Having carried their canoes to the foot of the fall, they assemble in one place, where one of them takes up a collection with a wooden plate into which each puts a piece of tobacco. After the collection, the plate is set down in the middle of the group and all dance about it, singing after their fashion. Then one of the chiefs makes a speech, pointing out for years they have been accustomed to make such an offering, and that thereby they receive protection from their enemies; that otherwise misfortune would happen to them, as the devil persuades them. They live in this superstition, and in many others as we have stated elsewhere. When he has finished, the orator takes the plate and throws the tobacco into the middle of the boiling water, and all together utter a loud whoop.[51] These poor people are so superstitious, that they would not think they could have a safe journey, unless they had performed this ceremony here, more particularly since their enemies, not daring to go farther on account of the bad trails, wait for them at this spot and surprise them, as they have sometimes done.
>
> (Biggar (ed), 1925a: 302-3)

Increasingly, the Iroquois, whom the Algonquin referred to as *Matchi Nottaway,* (meaning "bad snakes") were stepping up their offensive attacks deeper into Algonquin territory. It was not haphazard that the Algonquin had previously come under attack at this location. Two tributaries are within eyesight from Sault de la Chaudière, the Nàgatinong (Gatineau River), which Champlain simply refers to as the "rivière qui vient du nord" and the *Pasapkedjiwanong* (Rideau River). Champlain writes: "Where this river [i.e., Gatineau] has its debouchure is another coming from the south [i.e., the Rideau], at the mouth of which is a marvelous fall. […] The savages take pleasure in passing under it, not wetting themselves, except from the spray that is thrown off. […] When the savages desire to enter the river they ascend the mountain [cliffs], carrying their

[51] What is lost in the English translation of this ceremony by Biggar (1925a) is that the tobacco is not thrown into "the middle of the boiling water". In French, Champlain says the tobacco was thrown into the middle of the *chaudière*. Meaning the tobacco was offered to the rapids and thrown in the middle of the river.

canoes, and go half a league by land. The neighbouring country is filled with all sorts of game, so that the savages often make a stop here. The Iroquois also go there sometimes and surprise them while making the passage" (Slafter (ed.), 1882: 60). The *Pasapkedjiwanong* connects with the *Cataraqui* river to the St Lawrence at Gananoque and provides an artery to make incursions deep into Algonquin territory. Furthermore, the thunderous sound of the waterfalls combined with the need to come ashore for a portage made this location particularly dangerous since it provided a natural cover for the Iroquois to attack in relative silence.[52]

3.3 - Algonquin ontology informed by spatial geography

Territorial boundaries were organized around the natural watersheds of the tributaries that feed into the Kichesippi (Ottawa River). For example, the *wawashkesh irini* (Deer people) inhabited the Rouge River, Petit Nation and Lièvre Rivers; the *matouweskarini* (Madawaska River people); and the *Kinozhe sipi iriniwag* (Pike River people). Within these territories land was divided up into smaller units of about 1000 square kilometers that could support an extended family of about 30 people in winter. In general, a family's winter camp territory was passed down from generation to generation unless the family moved away or there were no more living heirs. Neighbours were only allowed to enter one another's territory if they were actively tracking or in pursuit of an animal they were hunting. Trap lines could not infringe on another family's territory and due to the demand for furs on the commodities market, trapping took on a greater significance in the subsistence economy. The Algonquin were generally on good terms with the *Timiscimi* (Timiskaming people) on the upper reaches of the Ottawa River and the *Outimagami* (Temagami people) to the north; and closely allied with the *Nipising irini* (Nipissing people) (Morrison, 2005: 14-16).[53] They also traded game meats for agricultural produce with the *Wendat* (Huron), whom

[52] Champlain said the noise in this basin was so loud it could be heard from two leagues away (9.7 km).
[53] At the time Europeans knew very little about their northern neighbours. It took until 1670 before the first European would travel north of Mattawa, which was the juncture to the French River and the route westward onto the Great Lakes. As much as the great inland sea, (the Hudson's Bay) was a desired destination to reach, it was not a priority since information about natural copper deposits in the Great Lakes region kept the French focused on heading westward in search of precious metals and to cut the British off from their own ambitions of northern expansion.

they amicably called *Niina Nottaway* "our snakes", a name that acknowledges the *Wendat's* Iroquoian origins (Trigger, 1990).

Many of the place names the French use are toponyms taken from literal translation of the Algonquin place names. In *anishnaabe* the Chaudière Falls are called *Akikodjiwan* – which means 'place where the water falls into stone basins whose rounded form resembles a boiler' – because of the vigorous way the water has hollowed the river basin and swirls around like boiling water. Sault-de-la-Chaudière is thus a direct translation meaning cauldron falls. What's important here in terms of the way cognition and memory are intricately linked and mapped onto territory is not merely that place names or word-sounds are ascribed as signposts to communicate a particular geographic location and remind one of the significance or resource at this place. To the French settlers the "Chaudière" falls have some distant origins in *anishnaabe* about how the Algonquin thought the basin resembles a cauldron. But for the *anishanaabe* the name of the falls is linked to a particular cultural practice and ceremony that must be observed every time at this location. In this sense, each time a person travels through the *Akikodijwan,* and each time the name is spoken, it serves as a reminder not only where this place *is* but also what one should *do.* Likewise, upriver at *Opwagani pawatik*, or Sault des Calumet (pipe rapids) the alabaster stone was collected specifically for the purpose of making pipes (Speck, 1915: 2). Sacred sites carry with them a lexicon that is intricately woven into the memory of cultural practice. This direct relationality with a topography that integrates embodied discourse serves to remind future generations what purpose or activity should take place. It is an ontology that is reciprocally generated by the geography from the ground up every bit as much as it is practiced by humans trodding - or in this case, paddling the landscape.

In *anishnaabe*, *n'asema* (tobacco) and *opwagan* (the pipe) are animate objects, and they are equal agents in the protocols of ceremony. It is clear Champlain is witnessing the significant role tobacco offerings and pipe ceremonies have in navigating the relationships between people and

their territories. When Chief Tessoüat shared tobacco and received Champlain with a pipe ceremony he was not merely doing so as a gesture of hospitality. As Champlain noted: "we spent a full half hour at this ceremony, without uttering a word, as is their custom" (Biggar, 1925a: 283). In Indigenous culture this ceremony customarily precedes dialogue between emissaries of nations in accordance with certain protocols. The pipe is kept wrapped in a sacred bundle and only opened by the person who is the pipe carrier. Tobacco is regarded as sacred plant medicine. Participants in the ceremony inhale the medicine within their bodies. Before anybody spoke people were required to engage in this communal activity, sitting shoulder to shoulder with the chief respectfully passing the pipe around. The tobacco medicine purified people from within. Once the silence was broken speech words were cleansed and people were required to speak truthfully and then to abide by all the decisions made during the council meetings. Pipe ceremonies are so well imbricated into the fabric of Algonquin society, that the standard unit of time and distance *Nijopwagan*, meaning "two pipes", was measured in the time it took to smoke two pipes, about an hour (Cuoq, 1893: 142).

Chuck's grandfather, Elder William Commanda, the late Grand Chief of Kitigan Zibi (Maniwaki) speaks about the encounters his ancestors had with the French and about the sacred site of *Akikodijwan*.

> "The Chaudière Rapids were especially significant – they reflected the shape of a pipe, in this place of *glare rock*, and the rising vapours were an expression of the prayers of the people rising to the Great Mystery on the wings of the wind. The Mamiwinini consecrated the place with prayer, and this was noted in one of the earliest paintings of the *Asinabka* area: it is [a] painting of three native men in different outfits, perched on an outcrop of rocks, smoking the sacred pipe, and offering tobacco to the whirling rapids below them.[54] - William Commanda, 2010.

[54] *Asinabka* – or glare rock- is the Indigenous name for the entire Ottawa River Valley. It points to the ancient knowledge of the former seabed when the inland sea (the Champlain Sea) retreated rather rapidly about 12-11,000 years ago revealing a vast new landscape of glaring rock beneath it. *Asin* is also the most ancient name in *Anishnaabe* that their ancestors were called and refers to the original first inhabitants in this area.

Elder Commanda continues: “The vignette of Champlain’s first famous *foreigner’s* encounter with the Mighty River reveals the attitude with which the sacred watch of my ancestors was dismissed as trivial and superstitious; we and our land have experienced great pain with the imposition of other Gods upon us. […] I am a ninety five year old Algonquin from the Ottawa River Watershed, and my passion and commitment over many decades has been to draw attention to the ceaseless plundering and destruction of the grand natural resources of my ancestral lands, the deepening environmental crisis across the globe, and its impact on our lives and health; to promote environmental stewardship; and to warn of the crucial need for Indigenous wisdom in reclaiming a balanced relationship within the world we all live” (2010). Elder Commanda’s impassioned speech was delivered in person and included in a report to the Government of Canada, the National Capital Commission, and to the City of Ottawa. He is the carrier of 3 *wampum* belts, a record keeping artifact, used to commemorate diplomatic agreements between nations and peoples. One of the Wampum, The *Three Figure Welcoming and Sharing* Wampum belt dates to 1700 and depicts three figures, the French on one side, the British on the other, and the Algonquin in the middle. Elder Commanda says this Wampum commits the Algonquin “to embracing the newcomers and sharing our values and grand natural resources with them” (Commanda, 2010).

Fig. 12. William Commanda showing the *Three Figure Wampum*

The *Three Figure Wampum* is often cited as proof the colonizers did not honour their agreement to share the land. Paula Sherman points to the *wampum* while petitioning the government for a healing center for the Ardoch First Nations at Pine Lake. She elaborates: “The placement of

Indigenous Peoples in the centre of the belt represents the special position that Indigenous Peoples have as central figures of autonomy within the landscape of North America. This belt not only carries forward the relationships between Omàmìwinini people and children of the British who inhabit our lands today, it also carries forward the spiritual nature of Omàmìwinini relationships with the land. The belt reminds us that we have responsibilities to maintain those relationships through the use of lands and resources in ways that are culturally appropriate so as to promote balance and sustainability for all living entities. This includes securing the cultural futures of our children and grandchildren" (ibid). [55] She said the healing center would "be a significant tool in coaxing Omàmìwinini people from the margins where we remain cognitively colonized and unsure of ourselves and our relationship with the land" (2008: 122).

In accordance with the *wampum* Elder William Commanda put forth his community's vision and plans for the construction of *Asinabka* – A National Indigenous Center, at the sacred site where for over five-thousand years his ancestors gathered to pray at the Chaudière Rapids. He says: "it was the site of first encounter between my Indigenous ancestors and Champlain at what was to become the doorway to the grand natural resources of Turtle Island [Anishinaabe name for North America]; it was the site where my ancestor Machecewa encountered the first settler in this area, Philomen Wright; on both occasions, my ancestors lit their pipes in prayer for peace, the essence of which is captured in the word, *Ginawaydaganuc – we are all connected.* Over the two centuries that ensued, we were gradually removed from our ancestral grounds on the Ottawa River Watershed, and our sacred site became a desecrated wasteland. Over the past forty years, we have returned there for strength and sanctuary, and have lit many pipes to reignite our connection to the *Source*" (Commanda, 2010)

[55] The Algonquin have an umbrella designation for themselves as either *Omàmìwinini* 'downriver' people for everyone living south of and including the Kichesipirini, or *Otickwaganini* 'last water' people, for everyone north of and including the Nipissing to the headwaters.

When William Commanda says that his ancestors' sacred site has been turned into a desecrated wasteland, he does not mince his words. Canada has long ignored Indigenous land claims and issued hydraulic leases to use the Chaudière Rapids in perpetuity for industrial use for as little as $100 a year. In the early 1800's the Chaudière Rapids posed a logistical problem for the millions of board-feet of timber being gutted and floated downriver from forests in the Ottawa Valley. How to get the lumber to market farther downriver without crashing over the 35-foot falls and jamming up the cauldron basin below? In 1829, Ruggles Wright (the son of aforementioned first settler in the area Philomen Wright) dug a channel for a timber slide on the Quebec side. This was followed by a second timber slide in 1845 built by George Buchanan on the Ontario side. The Eddy, Booth and Bronson families each built sawmills on the islands adjacent to the falls to process the logs into square timbers, which were then bundled into rafts and sent down the slides onward to Montreal. In 1882, a fire destroyed most of the mills, and E.B. Eddy rebuilt and converted his planning mill into a pulp and paper mill. In 1900, The Great Fire, destroyed 2/3rd of the town of Hull on the Quebec side, managed to jump the river by igniting the stockpiles of stacked lumber, destroyed all the mills again, and burned 1/5th of the city on the Ottawa side.[56] After this fire the Booth mills rebuilt and also converted to pulp and paper; together these mills operated for over a century spewing contaminated wastewater into the Kichesippi. In 1908, a dam was built submerging the falls entirely to generate hydroelectricity. The dam stopped the seasonal migration of eels, an essential harvest of the Algonquin, and reduced their populations down to a mere 1% from their original numbers.[57] It also drastically altered the landscape and water-table. No longer could one stand at the edge of the falls and offer tobacco to the pipe cauldron. The falls were gone. The last official log drive was in 1988. By the 1990's calls to "free the falls" and restore the mighty river to its former beauty began to gather momentum. Mind you, this was not out of any legitimate concern or respect for Indigenous rights. The giant concrete wasteland of dilapidated, abandoned mills right in the heart of the nation's capital was

[56] E.B. Eddy was also the founder of the Eddie Match Co. which also burned down. It was the largest manufacture of sulphur wooden matches at the time in the world. Its corporate structure was 2/3 shares owned by British Match Co. in London and 1/3 by Dominion Match in the US. Eddy pulp and paper mill was also the largest paper producer in Canada at the time

[57] The Chaudière Ring Dam was the first hydroelectric generating station on the Ottawa river. The Ottawa River now has over 50 major dams obstructing the American Eel breeding grounds and migration.

an eyesore and tarnished the image of a city striving to portray itself as modern, clean, beautiful and world-class. In 1998, Domtar Inc., a corporate giant in the pulp and paper industry, purchased the pulp and paper mills. Domtar also became co-owner with the Government of Canada of the islands at the Chaudière Falls. In 2006, Domtar announced the closure of the mill, and for a moment it looked like the site may potentially be decommissioned. However, Domtar then doubled-down and struck a revenue-sharing deal with the city of Ottawa that would see an influx of 'green' dollars to upgrade the turbines in the aging hydroelectric facility and generate 'clean' electricity for the next 100 years. The Algonquin lobbied and protested for the lands to be returned so they could develop a National Indigenous Center. From the 1980's onwards William Commanda had been working tirelessly with renowned architect Douglas Cardinal (the same architect who designed the Canadian Museum of History on the north side of the river facing the parliament buildings) to submit plans for the *Asinabka* Center to parliament. In 2014, Domtar held secret shareholder meetings with the City of Ottawa. Four police forces – the RCMP, OPP, and the municipal forces in Gatineau and Ottawa were briefed in preparation to quell any Indigenous uprising. Domtar then announced that they were selling their share to Windmill Inc. a developer of a billion-and-a-half-dollar "world-class sustainable waterfront community" of condominiums, shops, and offices. A move which prompted Douglas Cardinal to say: "You do not desecrate a sacred site; you don't build condos in the Vatican" (2018). In 2016, Kitigan Zibi band council filled a land claim and injunction to stop the developers. In 2018, the first buyers received the keys and moved into their new condos with plans for the next phases of construction for the sprawling 37-acre 5000-unit mega-complex to continue over the following 15 years. The condo development is called "Zibi" a name that the developers felt resonate with new buyers who would enjoy private ownership of the desecrated site overlooking the Kichesippi (often shortened to Zibi).

The vignette of the *Akikodijwan* (Chaudière Falls), and the tobacco ceremony illustrates how practice is handed down from the river itself and how the entanglements of human and non-human relationships guide embodied discourse that is at once material and ideological. In

Indigenous cosmology rivers participate in the language that is spoken, in the beliefs, and in the cultural practices of the Algonquin people. In this sense, the material environment including its rivers and vegetation, like tobacco, press upon the present states of mind of the Algonquin to guide their thoughts and complex behaviours as they navigate through their traditional territories and livelihoods. In Algonquin ontology, rather than divide or carve discrete boundaries between the material and the conceptual worlds as is typical of conventional western categories, the river is a sacred landscape that is blended into a wholeness and unity of interconnected relational practices. This is what is meant in the Algonquin prophecy of *Ginaweydaganuc -we are all connected*. In this example we also observe how landscapes serve to stabilize and transmit cultural knowledge and practices over thousands of years. As Paula Sherman says: "the relationship we have with the land, makes it possible for us to actually come to know from the depths of our hearts and our minds" (2008: 124).

Upon his appointment to Officer of the Order of Canada in 2009, William Commanda in his acceptance speech to the Governor General and to the Queen of England reflects on what it means to be Indigenous in the wake of their brutal regime of colonialism. As chief of his community and as an Elder in his 96th year, he tells the Government of Canada, who has just bestowed one of their highest orders of recognition upon him, that the Algonquin people experience "divorce from the land, the destructive attack on our identity, our political, judicial, family, social and cultural structures, the outlawing and undermining of our profound and integrated spiritual ceremonies and ideology, and our invisibility in our homeland are the manifestation of the deepest *solitude* within this country."[58]

William Commanda mentions his ancestor Machecewa encountering Philomen Wright in the year 1800 as a key turning point of loss of territory for the Algonquin. It would be appropriate to ask

[58] In "William Commanda's Reflections in Correspondence to the Governor General and the Queen Regarding His Appointment to Officer of The Order of Canada and His Work" published at http://www.circleofallnations.ca

how the Algonquin went from being powerful warriors who defended their territory and controlled access to the Kichesippi and the entire continent that lay beyond - to being treated like squatters and forcibly removed from their own land. In 1854 Chief Pakinawatik, William's great-grandfather, led his people from Oka on the shores of the Lake of Two Mountains just west of Montreal, to Kitigan-Zibi (Maniwaki) 150 kilometers upriver from Ottawa in the backcountry bush on a lesser traveled tributary called the Gatineau River. If territory is a part of mind, and if memory is a product of our material engagements, then the specific circumstances of the removal and dispossession of Algonquin people from their homelands matters for understanding precisely how this cognitive loss was experienced. Retracing the history from mid-seventeenth to the mid-eighteenth century contextualizes how the Algonquin have become divorced from their land, gradually removed from their ancestral grounds on the Ottawa River Watershed and pushed to the northern reaches of the backcountry. Or as Paula Sherman so aptly put it, the *Omàmìwinini* have been cognitively colonized, living at the margins of their territory and unsure relationship with the land (2008: 121). Under these terms, the return of Indigenous lands is not just the simple question of territorial land claims that it appears to be. The "Land Back" is also a struggle for Indigenous people to regain cultural structures, identities, and cognitive autonomy, which are profoundly intertwined, and land based.

3.4 Mid 17th C. to the Great Peace of 1701

Conventional histories (both Indigenous and Western) of the St Lawrence River Valley assume the Algonquin were displaced or withdrew from their traditional territories due to an advancing frontier. This narrative serves to reinforce a contemporary interpretation of colonialism that blankets all Indigenous people as disenfranchised and disempowered. However, at the time of early contact this couldn't have been farther from the truth. The Algonquin were very much involved in forging a place for themselves as constituents of the new settlements along the St Lawrence. In fact, far from being the collateral damage of colonial expansion, (or simply on the losing side of the battle between the French and the English) the Algonquin were active participants in diplomacy, armed conflict, migration, religion and in building new Indigenous

communities along the St Lawrence River Valley (Lozier, 2018). The Algonquin, along with the Huron (Wendat), the Montagnais (Innu), the Atikamekw, and the Iroquois were experimenting with new modes of living and creating new political, economic, and social alliances. In the new Christianized mission communities of Lorette (Wendake), Arsikantegouk (Odanak), Kanesatake (Oka), Kahnawake, and Skawenati, a few thousand Algonquin embraced a more sedentarized way of life and positioned themselves well to maintain a constant presence and influence in the immediate vicinity of French villages. Seasonal travel back to families who remained in traditional villages and on traditional hunting grounds also helped maintain continuity with their habitual subsistence patterns. Vibrant cultural exchanges were constantly being negotiated. Christianity was not whole-heartedly adopted and Indigenous people did not entirely renounced their old customs and ways of life (Rhonda, 1971; Dickason, 1984). Rather syncretic and hybridized forms of spirituality co-existed. For example, just as the French travelled to see the Algonquin in their villages upriver and in the interior of the country and smoked tobacco and engaged in ceremony at the commencement of negotiations, the Algonquin showed a similar willingness to engage in Christian ceremony and allow their children to be baptized. Ultimately though, as ethnohistorians have pointed out, early mission communities were indeed the precursor to modern-day reserves (Day 1981, Lozier 2018).

The second half of the 17th century ushered in an era of rapid change for the Algonquin as the French made a concerted effort to populate their new colony. Guiding colonial expansion were the five mainstays of settler economy: fur, war, religion, agriculture, and resource extraction. The St Lawrence River Valley saw a rapid influx of people from migration as sailors, merchants, soldiers, carpenters, masons, blacksmiths, farmers, tanners, and unskilled labourers were recruited from the port cities of Rouen, La Rochelle, Bordeaux and Paris to clear land and build the new settlements at Quebec, Trois-Rivières and Montreal. Women were recruited and some *aventurières* were dispatched to the forts on the frontier, but most stayed in the settlements to become nuns, teachers, nurses, homemakers, farm helpers and *filles à marier*. A large share of the imported labour was considered unskilled related to the clearing of land, chopping or sawing

wood, building irrigation ditches, removing rocks from the fields, building fences and in the domain of agriculture; tending crops, harvesting hay for animal feed, working in the stables, and raising livestock (Geloso, 2019: 298-9). Much of the clothing and goods still had to be imported from France and the merchant mark-ups were significant, making life in the new colony relatively expensive. Many of the labourers, who were brought over on 36-month contracts, chose not to remain. In 1666, the first census reported 3,215 people with a ratio of three men for every woman. To remedy this from 1663-73, King Louis XIV sent 800 *filles du roi* to live and help populate the new colony. By 1681, Canadian births out-paced migration and the population of Nouvelle France rose to 9,677.[59] Life in the settlements was still very much organized around supporting the fur trade and frontier expansion, which continued to push westward around the northern shores of the Great Lakes to the *Pays d'en Haut*.

The French began clearing the forests for timber and agricultural lands; however, this had a slow effect on the landscape since they lacked the critical mass of people to effectuate large-scale work. The political landscape, on the other hand, changed abruptly with the importation the seigneurial system - a systematic settlement scheme – that carved up the land into tidy estates with geometric boundary lines for civic administration. This system was completely at odds with and undermined the way the Algonquin administered their land. The Algonquin divided up into small bands that inhabited watersheds and retreated to their family's winter camps. In the 17th century, New France, claimed 7,985,470 acres as their own without any regard for Indigenous title or claim. The King granted 2,096,754 acres (26.3%) to the Roman Catholic Church.[60] The other 5,888,716 acres were gradually doled out and divided up amongst 376 seigneurs or feudal

[59] By 1720 population was 24,434.

[60] One quarter of the territory of New France was an enormous amount of land to be held by a small handful of ecclesiastics. According to Myers in 1720, long after the land grants had been gifted to the Church, this immense amount of land was controlled by 24 Jesuits, 32 Recollets, 67 Parish priests and missionaries, 175 nuns and 31 priests of foreign missions (1914: 23). The Church did, however, have a social mandate to deliver on state education and health care and these services required an independent means of generating capital. The immense economic foothold on land provided the natural capital for the Church to extract taxes from the peasant and working class and to accumulate more than enough wealth to fulfill their social mandate.

lords (Myers, 1914: 23).[61] Insufficient number of inhabitants still slowed the process and left vast tracts of land uninhabited. In the first thirty years of the seigneurial system from 1623-1653, only sixty-two seigneuries were drawn and these mostly around the three population centers. In 1671, intendant Jean Talon oversaw a period of rapid expansion granting a further 46 seigneuries to governors, military officers, and successful fur trade merchants in an effort to occupy all (so-called vacant) lands on both shores of the St Lawrence from the Gaspé peninsula to Montreal (including the Chaudière and Richelieu Valleys as well as the St John River in Acadia).[62] Becoming a seigneur, something which had previously only been bestowed on noblemen, now became accessible to men of a more modest military and merchant pedigree and virtually assured one's ascent into aristocracy and wealth.

The seigneurs were given hereditary feudal jurisdiction, which could only be revoked or forfeited for non-settlement or non-cultivation, (a rare but not unheard-of occurrence).[63] Land grants came with a conditional contract stipulating the types of development and resource extraction that needed to be carried out. For example, Sieur Dupuy was given Heron Island and some adjacent islands in the St Lawrence that included fishing rights but also a duty to pay "fealty and homage" and every seigneurie had to "ensure the King could take at pleasure" all the oak timber for shipbuilding (Myers 1914: 24-25). As feudal lords, the seigneurs parcelled off land into smaller lots that were gradually conceded to tenants, or *habitants* as they were called, and put into

[61] In general, most seigneuries went back two to four maybe 6 leagues (1 league is about 3miles) from the river. Although there are exceptions and very large seigneuries, like Le Batiscan and Cap-de-la-Madeleine, go back more than 20 leagues. The largest of the seigneuries were carved out in the early days just prior to when the seigneurie system became official in 1627.

[62] The Chaudière Valley is the drainage basin of a 185km river that flows north from Lac-Mégantic and empties into the St Lawrence just opposite Quebec City. The local *Attikamek* called it the *Kikentekw* river. It is unrelated to the Chaudière Rapids along the Kichesippi (Ottawa River). The Richelieu Valley 124 km is the same as the previously mentioned *Rivière des Iroquois* which flows from Lake Champlain north into the St Lawrence at Sorel (east of Montreal).

[63] For example, the seigneurie of Notre-Dame-des-Anges, on the north side of Quebec City, had a respectable population of 120 people. However, in 1686, Jean Talon felt that a significant portion on the north side of the seigneurie was underdeveloped and expropriated the land from the Jesuits to create 3 new boroughs: Bourg-Royal, Bourg-La-Reine, and Bourg-Talon, which were later amalgamated into the Charlesbourg sector as Quebec City grew. Though these occurrences were rare, it also served as a reminder that the state exerted dominion over lands that were administered by the Church.

production through concession. Leases made explicit that: all pine and oak were reserved for the crown, an eleventh portion of all fish caught would be extorted, peasant farmers must use the seigneur's mill or communal ovens for baking, and pay servitudes usually in tithes (one tenth of their economic output) in cattle, sheep, hay, fruits, flax, tobacco, bushels of grain, and other vegetable produce. Though some have argued that peasants in the colonies fared better than the average in France (e.g. Altman, 1983), comparatively their standard of living was far below farmers living under the British 'freehold' land ownerships system (Geleso et. al. 2016). Abject poverty was rife among the peasantry in New France, as they suffered under the burden of and gluttony of the clergy and the seigneurs who would "stop at no acts of injustice in striving to promote their own interests" (Myers, 1914: 21).

3.5 Algonquin & Iroquois Peace Alliances

In the early spring of 1644 when the canoes still had to be dragged along the ice to make it out to open water, Simon Pieskaret, a fierce Algonquin warrior, led a small party of 6 men once again down the *Rivières des Iroquois* whereupon his party came across 14 Mohawk men. They fought and killed nine, one was wounded and drowned while trying to swim to escape, two managed to escape, and the other two men (Honatteniate, the other is unknown) were taken captive. The captives were taken to the Jesuits at St Joseph in Sillery.[64] Pieskaret spoke with the governor of New France, Huault de Montmagny who decided to send the captives to Trois-Rivières with instructions for commandant Chamflour, to release Tokhrahenehiaron (a Mohawk man who had been captured the previous year) to send word back to his people that the French wished to negotiate a peace treaty. [65] The terms: The French wanted a general peace so the Iroquois would

[64] A Christian missionary named Bernard was travelling with Pieskaret. Bernard had been a former prisoner of the Iroquois and spoke their language fluently. Pieskaret had also been baptized and given a Christian name, Simon. Most captives would have been tortured and killed, but it was Bernard's insistence of being 'illuminated by the knowledge of their holy Faith' that they take the two men and leave them whole and unharmed. Honatteniate was so taken by the unusual act of kindness that he would later convert to Christianity and become a staunch ally of the French.

[65] It appears that Pieskaret was acting alone when he spoke to the Governor and suggested the Mohawk prisoners could be used to negotiate a peace between all the nations in the regions. Perhaps he wanted to be on good standing

stop marauding the Huron fur trade cargo convoys and in exchange for the two captives they sought the return of Guillaume Couture, (a French captive). Tokhrahenehiaron was released the following spring in 1645 and given letters (intended for Couture to assuage any doubt that this was not an ambush) and laden with gifts and he promised to return within 2 months. As a messenger in an official peace process, Tokhrahenehiaron, kept his word and returned in 40 days with Couture and two Iroquois chiefs Kiotseaton and Aniougan. The chiefs were sent on account of them being renowned orators and they declared themselves the mouth of their community (l'Incarnation, 1645 / 1967: 135-151).

A few days later, on July 12, Governor Montmagny arrived from Quebec at the fort in Trois Rivières where the proceedings of the peace council were to take place. Marie de l'Incarnation of the Order of Ursulines and Father Vimont from the Jesuits mission were both in attendance and describe the ceremony as follows: A ship's sail was erected over the courtyard of the fort to provide shade on this unusually hot summer's day. At one end the Governor, his men, Commandante Champflour, Father Vimont and "At his feet the five Iroquois were seated on a long piece of bark, for they wished this place as evidence of their love and respect for Monsieur the Governor" (l'Incarnation, 1645 / 1967: 141). The Algonquin, Montagnais and Attikamek emissaries were at the opposite end and flanked by the French and a few Huron men (the Huron did not send a chief or have any official representation). Kiotseaton came with seventeen wampum, each carrying a specific message of thanks, safe travels, goodwill and promises on behalf of the Iroquois to uphold the peace.[66] The first eight wampum are part of the preliminaries

with the governor of New France but he told the Governor he brought him the captives as promised, which implies a previous hearing with the governor or his agents took place. A peace treaty may have been something Christian (i.e. baptised and converted) Algonquin people wished for, but it was certainly not the sentiment amongst Algonquin nor the Iroquois who lived at a distance from the French settlements on the St Lawrence. Records show that the proposed peace was indeed a tough sell for the emissaries who then had to pitch the idea to their people back home. Mutual distrust and animosity ran deep.

[66] The First wampum (1) thanked the governor for sparing Tokhrahenehiaron's life. (2) commemorated the difficulties Tokhrahenehiaron encountered as a runner on the return journey to his country and gave thanks for his safe travels enabling him to bring a message of peace. (3) promised the Iroquois would lay down their hatchets and no more bloodshed. (4) assurances the Iroquois held no contempt or residual anger for the families who perished in previous slaughter. (5) to cleanse the rivers and take away the enemy canoes. (6) to hold back the rapids so nothing can impede their path. (7) to smooth the waters of the Great Lakes allowing for safe journeys. (8) to make land

protocol meant to establish a psychological connection among council members and remove any obstacles to the official communication of the peace treaty (Foster, 2015). During his impassioned speech as he was delivering the tenth wampum, Kiotseaton "took a Frenchman on one side, linking his arm with his own, and an Algonkin on the other" to show that they are all now allied and bonded tightly together (L'incarnation 1645/1967: 145). The eleventh wampum offered an open invitation to Iroquois country: "Our country is full of fish and venison […] come and eat good meat with us. The way has been cleared, there is no more danger" (ibid). In the days preceding and days following, feasting was an integral part of the peace council. As Father Vimont notes, plenty of food and banquets were held so the Algonquin and Iroquois "gradually accustomed themselves to converse together" (Vimont 1645: 249). The eleventh wampum for feasting was used to contractually bind the waring nations to share and to reinforce an expression of unity. This wampum recalls another familiar Indigenous metaphor 'to eat from the same dish with one spoon', which is a way of saying that the land is plentiful and there is enough to provide for everyone. On the morning of 15th of July, the Iroquois chiefs accompanied by two French delegates left Trois-Rivières to carry the news of a successful peace council back to Mohawk country.

The delegation returned on the 18th of September 1645 and the peace treaty was ratified with the Huron who were absent from the initial peace council meeting in July.[67] This peace was short-lived and for all intents and purposes never really existed. Unbeknownst to the Algonquin at the time, the Iroquois used the peace council in July as an opportunity to hold two private meetings

travels safe. (9) to have fire ready day and night so that their homes may be warm without fear of being seen at night. (10) to show the bond they had now linking the Iroquois with the French and the Algonquin. (11) invitation to Iroquois country to feast with them. (12) to raise the clouds so the sun may shine bright enough to see the light in everyone's hearts. (13) was to remind the Hurons of their good intentions. (14) urged the Huron to speak to their leaders to ratify the peace treaty [Huron leaders were not present] (15) was to promise to return Father Jogues and Father Bressani – two missionaries taken captive by the Iroquois. (16) was to ask to be welcomed next time the Iroquois returned to pass through Algonquin territory and asked them to lay down their hatchets. (17) was a wampum from Honatteniate's mother sent as a gift for the man (presumably Bernard but could have also been destined as a gift for Pieskaret) who spared her son's life.

[67] 4 Algonquin bands were also brought into the new agreement with the Huron, to secure the commercial fur trade cargo route as it passed through Huronia. The Kichesiprini and Ononchataronnon bands are specifically mentioned, the other two bands are unnamed in the official record.

with Governor Montmagy and revealed to him that they will never make peace with the Algonquin. A secret counteroffer was made: "if he desired peace for both himself and the Hurons, he should abandon the Algonquins without shelter" (*JRAD* 28: 148-150). Initially the governor refused to betray his longstanding allies, however, to secure the safe passage of the commercial fur trade shipments, which were under constant attack by the Iroquois as they passed through Huronia, he conceded at the second meeting: "There were two kinds of Algonquins: one like ourselves, recognized as Christians, the other unlike us" (ibid). The French were all too willing to abandon their longstanding allies and signaled to the Iroquois that they would no longer protect pagan Algonquin. Under this backroom deal, only Christian Algonquin, who were baptized and living in shelters like the French, (meaning: assimilated and living in houses within earshot of the Church's bells) near or on the outskirts of the French settlements could expect any kind of peace.

In the fall of 1645, cracks in the freshly ratified peace treaty began to appear as news of the Oneidas (Iroquois) killing several (Christian) Algonquin men near Montreal began to circulate (L'incarnation 1646/1967: 152). The Iroquois ambassadors returned to speak with the governor and to reaffirm their commitment for peace and insisted this was the deed of a small break-away group who had not yet heeded the call for peace. Governor Montmagny offered the Iroquois gifts and reaffirmed that he would "protect them [Iroquois] as his children that they would be very welcome in French houses that they would find fire and cooking-pots always ready there to show how content we were to see them in our alliance […]" (ibid. 154). Marie de l'Incarnation remained optimistic about the potential missions among the Iroquois. "What was more pleasing to us than anything else, they requested Fathers to instruct them in their country. (l'Incarnation 1645/1967: 150). However, French – Iroquois relations were further strained when on 24 of September 1646 Father Jogues traveled to Mohawk territory, with Honatteniate and was summarily killed with a blow to the head by a hatchet and Honatteniate injured trying to shield the priest from certain death.[68]

[68] News of this would not travel back to the French until the following spring as recorded on March 5th in Jesuit Relations: "Some Algonquin women, who had long been captive in that country, quietly approached their fellow-countrymen and told them that the poor Father had been wretchedly murdered." (*JRAD* 30: 243).

In March 1647, two years after delivering the two Iroquois captives to the governor to negotiate a peace treaty, Pieskaret encountered 6 Iroquois men while he was out hunting elk south of the St Lawrence on the St Francis River. Pieskaret believing they were now on peaceful terms sat and smoked a pipe with the Iroquois men. Nicolas Perrot recounts how the Iroquois men told Pieskaret they were en-route to speak with the governor Onontio - the name they amicably used to refer to governor Montmagny. [69] During this friendly exchange they asked Pieskaret where he was from and he told them: "*son village estoit à la rivière de Nicolet, ou estoit campé en gros la moitié des Algonquins, et l'autres à la rivière Ouabmachis*"[70] When they got up to walk away, "*l'Algonquin [Pieskaret] au milieu d'eux. Il u eut un de la compagnie qui resta derriere et qui, les laissant aller un peu devant, les joignit ensuitte promptement et cassa la teste a l'Algonquin, qui ne s'en meffioit point*" (Perrot, 2004: 349).[71] Perrot says this small party of 6 Iroquois men had been out scouting the area as a detachment of a larger group of 1000 Iroquois who had recently taken up residence in the area (who were now allowed into the territory under the 1645 peace treaty). The scouts returned with Pieskaret's scalp and told the large group where the Algonquin

[69] Nicolas Perrot (b. 1644 - d. 1717) was a successful merchant and fur trader employed by the Governor General of New France. He wrote an eloquent manuscript, which was a little uncharacteristic for a merchant to do at a time when most writing was done by the clergy or government officials. A copy of his manuscript made it into the hands of Charlevoix in 1744 (given to him by the intendant M. Begon at le Havre) who says it was an indispensable read for anyone contemplating going to the French colonies. It wasn't until 1864 that his manuscript was first published. He would have only been a three-year old child still living in France when Peskaret was killed, nevertheless Perrot records the story of how Peskaret met his death, which he would have heard firsthand as it was repeated to him during his years spent working in the fur trade in New France.

[70] Translation: "His village is at the estuary of the Nicolet River, where the large half of the Algonquin [i.e. his band] are camped out. The others are at Ouabmachis river." Ouabmachis river is now spelled Yamachiche. It is a small river that empties into the north side of the St Lawrence near Trois-Rivières. Nicolet River is just opposite on the south shore of the St Lawrence.

[71] Jesuit Jérôme Lalemant confirms the death of Pieskaret saying the story comes via a prisoner, "voila disoit une prisonniere comme nous susmes trahis" who was with the larger group of Iroquois at the time and heard the news from the mouths of the Iroquois as they returned with Pieskaret's scalp to tell the story to their own people; "selon que nos ennemis mesmes le racomptent." (*JRAD* 30: 235) However, there are inconsistencies in the two versions. In Perrot, he encounters 6 men in Lalemant he encounters 10 Iroquois. Lalemant also says Pieskaret was killed with a spear "javelin into his loins, and pierced him through and through" and makes no mention of them having smoked tobacco together. He does say Pieskaret greeted the Iroquois men with a peace song. Lalemant's version would have been recorded around the time of the event and could be considered more reliable. Even accounting for minor drift in both versions of events, they nevertheless confirm Pieskaret's death was the result of the Iroquois using the cover of diplomatic peace to attack the Algonquin on their territory.

were camped. The following day the Iroquois split into 2 groups, one to dispatch of the Algonquins living at Nicolet and the other to attack those living at Ouabmachis. “Il s’en echappa quelque’uns de leurs mains, mais la plus grande partie fut prise ou massacrée.” (Ibid. 350). The Iroquois killed men, women, and children indiscriminately even though this band lived within sight of the French settlement at Trois-Rivières and had avowed Christianity. One of the Algonquin women managed to escape went on foot through the snow to the Jesuit Mission to announce the massacre and then returned to watch from a safe distance as her family was tortured and burned. Lalemant notes: “The French were touched to the last degree: they manifested a grief as keen as if they had learned the death of their own relatives” (*JRAD* 30: 245).

By 1650, the Iroquois had completely decimated the Huron Confederacy and continued to inflict considerable casualties on the Algonquin.[72] The escalation of war brought armed conflict right into the upper reaches and heartland of Algonquin territory. Jesuit missionaries reported that the Algonquin no longer travelled on the lower parts of the Kichesippi river (Ottawa River) nor on the St Lawrence due to persistent attacks. Instead, the Algonquin travelled a more northern route through Lake Temiscamingue where they portaged to the headwaters of the Lièvre and St Maurice Rivers and descended to Trois-Rivières. (Thwaites, 1899: 234-244).[73] Maintaining contact with their long-standing Montagnais and Maliseet allies in the east became increasingly difficult. The *Matouweskarin*i and the *Onontchataronons* bands who lived closest to the war path in the lower end of *Kichesippi*, began spending their entire summers near the new French settlements of Trois Rivières and Ville Marie (Montreal) (Morrison: 2006: 17-18). In effect, the French-Iroquois wars marked a period of significantly diminished use of their territory, forcing them to retreat into the relative safety of the northern reaches of their territory where they maintained their winter camps, while summer travel along their habitual trade routes became

[72] The Huron (Wendat) consisted of about 30,000 people living around Georgian Bay and Lake Simcoe. After prolonged warfare with the Iroquois, ending in defeat in 1649 a couple thousand survivors escaped and migrated to Wisconsin in the Great Lakes region, eventually merging with the 5 Nations Iroquois. A smaller group of refugees went east to live in closer proximity to the French on Ile-D’Orleans where they spent about 5 years before forming a small community (about 100 people) Wendake (Lorette), on the outskirts of Quebec City.
[73] in Morrison, 2005: 18

risky and unsafe. Under the pretense of peace, the treaty gave the Iroquois a pretext to access the French fur trade. It also allowed them to move and occupy the northern reaches of their territory on the south shore of the St Lawrence, that were previously in a traditional conflict zone exposed to attack by the Algonquin and French military forces.

The Algonquin continued to participate in several major offensives into Five Nations Iroquois territory. In 1666, French, Algonquin, Nipissing, Huron and Abenaki warriors destroyed all the Mohawk villages on the Finger Lakes in upstate New York, which led to the negotiation of a new peace treaty in 1667. The Iroquois then seized the opportunity to establish a series of villages on the north shore of the St Lawrence on the stretch between Kingston and the mouth of the *Cataraqui* river near Gananoque. One of the conditions of the treaty was that the Iroquois would allow access to the Jesuit missionaries. The Jesuits then convinced all the new converts to relocate to the mission at *Kentake* at La Prairie de la Montagne on the south shore of Montreal and others joined the Sulpician mission at *Kahnasetake,* at La Montagne (Mount Royal) on Montreal Island (Morrison, 2006: 20). French traders, believing the passage of their cargo was secure in times of peace also seized upon the opportunity to undertake a massive expansion into the *pays d'en haut* pushing into the upper tracts of the Great Lakes region. However, the English annoyed by the French expansion urged the Iroquois Confederacy to reignite the war in 1680 (Morrison, 2006: 21).

Governor Montmagny reaffirmed the French would only protect Christian Algonquin. This caused a great many Algonquin, who otherwise might have been indifferent, to bring their babies downriver each spring to be baptized and given Christian names at the missions along the St Lawrence. The damaging effects were compounded as it caused rifts among families who remained in communities and wished to continue with their traditional ways of life. However, just as the Algonquin expected the French to participate in tobacco ceremonies; the baptism ceremony was also an occasion to show a willingness to participate in inter-cultural rituals with

the French in order to maintain good relations and partnerships. Much to the frustration of the missionaries a great many of the so-called Christianized Algonquin converts would revert to their traditional ways of life once they returned to their communities upriver. The Iroquois continued their attacks into the upper reaches of the Ottawa River, (and into Attikamek country) on pagan Algonquin. Consequently, in 1680, the Temiskamengs and Nippisings fled and came to Montreal for protection and set up camp on Ile-aux-Tourtes. In 1691, Christian Algonquin living nearby would help fend off an attack on Montreal by joint Iroquois and English forces.

In 1696, Montmagny's successor governor Frontenac accompanied a war party of Algonquin and Nippising warriors that inflicted significant losses on the Oneida and Onondaga Villages south of Lake Ontario. The Iroquois also met resistance from the Ojibwe and Odawa in the Great Lakes region and were pushed out of southern Ontario. These major setbacks brought the Iroquois back to negotiate peace with the Algonquin, which led to The Great Peace of Montreal (1701). The agreement this time, stipulated the Iroquois would remain neutral in the event of intercolonial conflicts between the English and the French. This pattern of oscillation between war and diplomacy with peace treaties in 1645, 1667, and finally 1701 was born out of the geopolitical landscape of inter-Indigenous relations every bit as much and arguably more so than it was of colonial influence or interference.

In 1702, the year following the Great Peace, Louis Callières, the third Governor General of New France, wrote to the King (Louis XIV) pleading: "We lack bark canoes of which the Colony is entirely deprived since we no longer go to the Ottawa Country." (Callières in Kent, 1997: 37). After nearly two centuries of settler migration and commerce in Canada, Denis Riverin, a fur trade merchant, wrote in his memoir in 1705, "The Indians and especially their women excel in the art of making these canoes, but few Frenchmen succeed in it." (Riverin in Kent, 1997: 37).[74] The lack

[74] In 1777, a report to the Governor of the Hudson's Bay Company (HBC) in London, gives an indication of the challenges Europeans had in gaining skills in the craft of canoe building. "Robert Longmore (sic) hath this year built a large Canoe, but being his first attempt is not so hardy as required" (in Kent, 1997: 29). Longmoor persisted, and a

of canoes posed a major problem for the French. The solution was to shift away from the procurement of canoes through commission and trade and reorganize in industrial scale production. Montreal was strategically flanked by two missions, at La Prairie de la Madeleine (Kentake) on the south shore and Lac des Deux Montagne (Kanesatake) on the north shore. Trois-Rivières was flanked by Bécancourt and Pointe-du-Lac and the Huron village of Wendake (Lorette) was located west of Quebec City. With many skilled Indigenous builders now living on the outskirts of the three main French settlements, canoe building yards cropped up on the grounds of the mission villages where many of the Algonquin had now become accustomed to spending their summer months. The Algonquin continued to provide much of the labour and work steadfast to provide canoes for the French fur trade and military campaigns and Algonquin warriors acted as point guards to help protect French interests from attack by the English.

3.6 –Treated like squatters on their own land

The 18th century brought a significant diminishment in the Algonquin's autonomy and their ability to advance their own interests. The self-determination that previously guided Indigenous Nations in establishing new villages along the St Lawrence became increasingly scrutinized by the Church and competed with royal interests. The densification of French settlements, and expansion of the seigneuries along with the clearing of land for agriculture and the extraction of timber meant that land was unavailable for them. In part this was due to deliberate design of colonial policy to extinguish Indigenous title by dividing up the land into shared territories (i.e., let-this-be-ours & this-can-remain-yours). Also at work was the gradual innocuous drift where indeed French settlers were occupying and controlling the administration of greater amounts of space, which the Algonquin tacitly accepted as the sharing of land with their allies. Meanwhile, the Jesuits became keenly aware of the financial gain to be had with strategic relocations of Indigenous

few years later in 1780 he was dispatched and employed in the canoe building program at Hudson House in Saskatchewan, however, the records at the trading post indicate he always worked alongside and under tutelage of more expert Indigenous craftsmen. March 15, 1780: "*Four men employed along with two Indian men getting wooden work for Canoe Building."* April 7: *"9 men went off at 6 o Clock A.M. along with six Indians to fetch Birchrinde to build Canoes."* May 13, 1782: "*repairing canoes I have also imployed four Indian Women to assist us.*" (in Kent, 1997: 30-31).

communities at the missions. This not only had a deleterious effect on the longevity of Indigenous claims to the land beneath their feet, but also allowed the Jesuits to sell off the cleared and productive lands to the next wave of French colonialists at a hefty profit while the re-located Indigenous communities had to start over again on less fertile lands. The community of Lorette, for example, granted in 1651 to the Wendat Huron in the Sillery seigneurie was relocated to new Lorette in 1697, in Saint Gabriel seigneurie. Since old Lorette granted to the "*neophytes sauvage chrétiens*" was no longer, the Jesuits then petitioned the Crown for full ownership of Sillery. Similarly, Kentake, originally established for the exclusive use and enjoyment of the Iroquois of the Sault after the peace of 1667 in the seigneurie of La Prairie de la Madelaine was relocated 4 times before arriving at the present-day site of Kahnawake in 1717.[75]

Furthermore, the French became anxious about the financial implications of having Indigenous people dwell in missions on the more valuable tracts of land within urban centers. In 1717, the Sulpicians relocated the Indigenous population of their mission 'away from the influence of European settlers' in the city of Montreal. Though it was pitched as a means to protect Christian Indigenous people from ungodly sins and temptations of the city, in reality this was a euphemism for cleansing the city of Montreal from Indigenous people in what was arguably the first deliberate application of segregation in New France. Consequently, Kanesetake, which means mountain in Iroquois, named after Mount Royal, was moved to a new mission on the north shore of Lake of Two Mountains where it retained the same name. The Algonquins living at the western tip of Montreal Island in Ste-Anne-du-Bout-de-l'Isle were also relocated to the same mission village, though they refused to adopt the Iroquois name, instead they called it Oka, which means pickerel in Anishinaabe. Christian Algonquin and Christian Iroquois co-existed at the same mission the former enemies preferred to maintain separate living quarters.

[75] Present day Kahnawake is only 13,000 acres and significantly diminished territory from the original 45,000 acres land grant.

As the two imperial empires battled for world domination in The Seven Years War (1756-1763), the Algonquin remained closely allied and fought alongside the French against the English. This war, though mostly fought in Europe and in India, spread globally and several of the decisive battles occurred in the North American colonies. The English suffered a humiliating defeat in the Battle of Ticonderoga in 1758 when they attacked a vastly outnumbered French army at Fort Carillion on the southern end of Lake Champlain. Later the same year the English would capture Fort Louisbourg in French Acadia. However, it was the Fort at Quebec City, which sat perched atop the cliffs overlooking the breadth of the St Lawrence that would need to fall to interrupt the resupply lines of the entire colony. In the summer of 1759 General James Wolfe set sail for Quebec with 8000 troops. During the night of September 13, after creating a decoy distraction further upriver, 4500 British soldiers scaled the cliffs of Quebec City and made it up onto the flats of the Plains of Abraham at the western edge of the Fort. After being dupped into investigating the commotion upriver, General Montcalm and the French forces, (consisting of about equal numbers as the English forces, but also composed of about 1000 Algonquin and a large contingency of Canadian militia consisting of poorly trained fur traders) scurried into position to face off against the English. The English emerged victorious and delivered a decisive and crippling blow to the French. Remnants of the French army retreated to Montreal, though now in the dire position of being cut off from France. The following summer the English surrounded Montreal with three armies; approaching from the west at Lake Ontario, the east at Quebec and the south up the Richelieu River from Lake Champlain. On September 8, 1760, the Algonquin and the Nippising warriors stood ready to defend the last holdout of the French colony, however, Governor Vaudreuil negotiated the capitulation of Montreal to avoid certain mass casualties.

With the French colony firmly under British control, The Seven Nations, which included the Algonquin and the Nippising, joined the Six Nations Iroquois to form one large alliance in support of the British. In return the British agreed Indigenous people could maintain the rights to their villages and their respective Nation's hunting grounds (Morrison, 2005: 27). In 1763 at the signing of the Treaty of Paris, the French formally ceded the entire colony to the British. On behalf of

their Indigenous allies, the French, negotiated Article 40, which guaranteed Indigenous people would remain the rightful owners of the missions and the property of the mission villages after the transition to British rule. In the same year the British Crown issued The Royal Proclamation on October 7, 1763, which remains enshrined in the Constitution of Canada. The Royal Proclamation sets forth the foundations upon which Indigenous and Crown relations began and is often referred to when Indigenous people need to remind the Government of Canada to respect their legal rights. This proclamation banned non-native settlement of all lands in the interior of the continent and made the private purchase of Indigenous lands illegal. Only lands ceded by treaty could be settled.[76] The Algonquin refused to enter into treaty agreements with the British Crown. Consequently, the Kichesippi River was off limits to private citizens and even fur traders required a permit to pass through.[77] The Algonquin continued to enforce strict land tenure that was handed down through generations and managed by the local bands on their territory. Alexander Henry, a trader in the region between 1760 and 1776 comments: "[The Algonquin] claim all the lands on the Outouais, as far as Lake Nipisingue; and that these lands are subdivided, between their several families, upon whom they have devolved by inheritance. I was also informed that, they are exceedingly strict, as to the rights of property, in this regard, accounting an invasion of them as an offence, sufficiently great to warrant the death of the invader" (Henry, (reprint) 1901: 22-23).[78] To this day, the entire Ottawa Valley remains unceded Algonquin territory.

[76] Though beyond the scope of this chapter, the impact of 150 years of Treaty making in Canada has had wide-reaching implications for Indigenous people. In many cases Nations were coerced into signing a treaty without proper understanding of the document. Treaties, always contain an extinguishment clause of Indigenous title to land, often in exchange for a trifle of money and a promise that access to land and hunting rights would be protected. The Algonquin were enticed and then pressured to sell their land, but they never accepted. In an address to the Seven Nations, Lord Dorchester says: "Rather than taking land from his Indian Children to give to the whites, the King your Father has not only bought lands to give to some of your Nation who suffered during the last War, but he furthermore built houses and other commodities on those lands, […] ask the Mississaugas if they have not been paid for all the lands they have abandoned, and if they are not happy." (In Correspondence of Lieut. Governor John Graves Simcoe, Allied Documents relating to His Administration of the Government of Upper Canada. Vol. III E.A Cruikshank ed. Toronto: Published by the Society, 1923: 14-15).

[77] Ordinance respecting the Indian Trade, 13 April 1764. Canada Parliament, House of Commons Sessional papers, Vol. LIX, No. 9 Sessional Paper No. 29a: 196-197. (in Morrison, 2006: 29).

[78] In Morrison, 2006: 29.

After the war over 4000 French settlers returned to France. Initially the British never intended to make any serious attempt to settle Quebec. However, the American Revolution (1765-1783) presented a caveat to that plan when thousands of Loyalists fled north into Canada looking for refuge. [79] The seigneuries posed a legal headache that could not be easily resolved by the mere import of British law designed around the freehold system. In 1791, Adjustments were made where French speaking (Quebec) was designated as Lower Canada, and English speaking (Ontario) as Upper Canada and British Loyalists were encouraged to settle in the Eastern Townships of Quebec and along the St Lawrence and north shores of Lake Ontario through the Crown land grant scheme.

The Ottawa Valley, still considered far too remote and unworthy of settlement, remained by and large beyond the interests of the British Crown. The Algonquin, far removed from the interests of the Crown, had until this point maintained complete autonomy and jurisdiction over their territory and could govern and participate in foreign relations at their own will. The encounter between William Commanda's ancestor Machecewa and Philomen Wright in 1800 represents the point at which the Algonquin began to be displaced and forcibly removed from their land. Philomen Wright, an entrepreneur from Massachusetts, arrived with an initial capital investment of twenty thousand dollars. He swore allegiance to the British Crown and applied to the Township of Hull to clear the lands at the sacred Chaudière Falls for permission to build the first settlement in the Ottawa Valley. This critical moment, where the Algonquin were not consulted, nor was their permission sought marks a turning point where the government of Lower Canada no longer respected the agreement in the proclamation and the theft of land in the heart of Algonquin territory along the Kichesippi began.

[79] The Algonquin were told by Lord Dorchester, the Governor of Upper Canada (Quebec), in 1775 "to take arms against the Americans to conserve those same lands." The irony (and injustice) is that the threat of American invasion on Algonquin territory was overstated and the main loss of territory occurred in the aftermath of the American Revolution when Governor Dorchester, gave away Indigenous lands along the St Lawrence to resettle American Loyalists and some Iroquois. Prompting the Algonquin to write to the Governor and question if he "will be the only one who can be ignorant of our rights?" (In Letter from the Chiefs of the Seven Nations to the Governor, July 26, 1795, NAC RG8, I.A. Vol. 248: 230-32).

Many of the Omàmìwinini people – the Algonquin from the lower portions of the Kichesippi (including the areas surrounding the Chaudière Falls) had developed Christian-Indigenous identities and still lived either permanently or seasonally in Oka at Lake of two Mountains in the summer months. They remained in close contact with non-Christian family members and returned to their winter hunting camps for seasonal resource harvesting. Settlers began to flood into their traditional homelands along the Ottawa River putting pressure on natural resources on an industrial scale. The Algonquin became rightfully concerned as they had witnessed what settlement did to the St Lawrence. As before, the (Christian) Algonquin and Nipissing chiefs at Oka, who were well versed in European customs and law and who lived in proximity to the administrative centers of the city of Montreal, mobilized their power to engage in diplomatic relations. The chiefs made continuous petition to the government to halt development and the theft of land in their traditional territory.

On September 2, 1820, Algonquin Chief Pierre Louis Constant Pinicy, (Pinesy) and Nipissing Chief Laurent Kisinsick, at the Lake of Two Mountains (Oka) wrote a petition to Lord Dalhousie the Governor of Lower Canada asking the government to issue an official paper copy of the title to their land. In this petition they wrote:

> That the number of settlements growing considerably for several years in the places where they were accustomed to hunt, and the game becoming distant as a result of these new habitations, the petitioners find themselves in great need […] That in the last war with America, after having given several times unequivocal proof of their entire devotion and their sincere attachment to His Majesty, His Excellency Governor Prevost promised them that in remuneration for their services, and to reward the valour and exploits of their young men in different engagements, he would accord them lands on which they might support their families being the only ones of all the Indian villages deprived of that advantage. That by a Proclamation of the seventh of October Seventeen Hundred and Sixty-Three, the Government accorded them exclusively their hunting grounds. That formerly Governor Carleton gave them all the islands in the Ottawa River from Isle aux Tourtes where their old village was situated, up to Lake Nipissing; but until this day, though their ownership of these islands is not disputed, they have been unable to exploit them because they have not yet got the titles. [80]

[80] Petition from Chiefs of the Algonquin and Nipissing Tribes of Indians at the Lake of Two Mountains to John Johnson. NAC RG10 Vol. 16: 12691-12694)

The petition was delivered to Sir John Johnson, the Superintendent General of Indian Affairs, who forwarded it (with a recommendation to approve) to Colonel Darling the Military Secretary responsible for Indian Affairs on February 9, 1821.[81] On August 5th, 1822, Colonel Darling acknowledges receipt of the petition and replied to Sir John Johnson, denying the Algonquin's request for official title. His reason being: The Crown must be the impartial protector of all "Indian Children" under its paternal care and thus granting this land to the Algonquin and the Nipissing would be unfair to other Nations (i.e., Iroquois and Huron) who may choose to hunt in that part of the open country.

> The result of his Lordship's opinion on this question, which he considers of material importance, not only to these Indians, but as regards the general system of Government, in protecting equally all the Indian Nations who bear allegiance to the King, and live under his paternal care, is, that he cannot grant a specific tract of Country, however remote, to any particular tribe, or nation of Indians that the Whole of these widely extended regions ought to be open to all those, who chose to hunt, in the yet unsettled & uninhabited parts of them. They are equally free to the Algonquin, and the Iroquois, the Huron, and the Nipissing; who will always receive from His Lordship that impartial protection which His Majesty requires to be extended equally to all his Indian Children. [82]

The Algonquin negotiated the collection of rent from individual families of settlers on the Ottawa River, particularly those that settled on the islands in the Ottawa River, a practice that wasn't too far forgotten from when they used to collect tariffs and tolls on fur trade cargo that passed through their territory at Ile-Aux-Allumettes. The department of Indian Affairs even participated in collecting some of those rents on their behalf - a tacit acknowledgement that the lands undisputedly belong to the Algonquin. Meanwhile, the government of Lower Canada continued to issue permits to settlers without any regard for the Indigenous title.[83] The Algonquin and the

[81] Letter Sir John Johnson, Secretary General Indian Affairs to Colonel Darling, Military Secretary (NAC RG10 Vol. 494: 31028-31030)
[82] Reply Colonel Darling, Military Secretary to Sir John Johnson, Secretary of Indian Affairs (NAC RG10 Vol. 494: 31073-31075)
[83] By the 1820's nearly 30% of the Ottawa River was illegally occupied with settlers. Algonquin territory extended from Hawkesbury to Lake Nipissing 117 leagues (the Ottawa River being 100 leagues). Land patents for 27 leagues of shoreline had already been issued to settlers occupying Algonquin territory. (NAC RG10 Vol. 494: 31077)

Nipissing chiefs continued to petition the government to no avail. On November 5, 1824, Sir John Johnson wrote to Colonel Darling once again, reminding him of the government's obligations to the Algonquin as laid out in the Proclamation of 1763. He also informed Colonel Darling that the hunting grounds have been well defined, and only the Algonquin and the Nipissing (and no other Nation) have occupied and hunted on the grounds on both sides of the Ottawa River since time immemorable. Johnson urged him to reconsider and went far beyond what is typical for a government agent in advancing their land title case to advocate on their behalf, writing: "It appears to me that a due regard to Justice, and to the Benevolent Intentions of His Late Majesty, as set forth in the Aforementioned Proclamation, render a compliance with Their request both reasonable, and expedient […]"[84] Johnson also said the Algonquin do not ask or expect that the lands already settled would be restored to them, they simply wished for further settlement and encroachment on their territory to cease. Johnson went so far as to include a copy of an ordinance issued to the Abenaquis on the St François River that acknowledges their hunting rights and prohibits settlement without their consent and suggests to the Colonel that "something of the Same Kind would, I conceive, answer in the present Case" (ibid.). This letter presented a clear, convincing and thorough argument. The government of Lower Canada simply did not respond.

Three years later as tensions reached a boiling point. Major General Darling (promoted from Colonel) instructed the chiefs of the Algonquin, the Nipissing, the Iroquois, the Abenakis and the St Regis to convene on 25th of September 1827 in Montreal so that he may communicate with them on the matter of numerous petitions.[85] He instructed the Chiefs to bring interpreters and "appear in their medals and best Costumes"[86] The meeting was moved to the 5th of October to

[84] Sir John Johnson, Secretary of Indian Affairs to Colonel Darling, Military Secretary (NAC RG10 Vol. 494: 31027-31032)
[85] The Algonquin continued to petition the government sending more letters and affidavits in the following years. Some of these letters presented specific grievances asking the government to intervene in the case of individual traders trespassing and hunting beaver on their land. Other letters asked the government to intervene on account of other First Nations, (specifically the Iroquois) hunting on their land. The government tended to respond more promptly if there was an opportunity to act as mediator of conflict between Indigenous Nations.
[86] Letter Major General Darling to Lt. Col. Napier Indian Department. (NAC RG10, Vol. 20: 14196)

Caughnawaga (Kanawake), at the Iroquois village nearest Montreal. A transcript of the proceedings of the Grand Council records M.G. Darling chastising the Iroquois and the Abenakis for being the principle offenders in the Algonquin's complaints, saying: "I fear that the Iroquois do not always conduct themselves like peaceable good Children."[87] He goes on to say the Algonquin should abandon the custom that considers it an offence for other Nations to hunt on their grounds and for the Iroquois to confine themselves to hunt strictly to the grounds that have been assigned to them (ibid). On the matter of settlement by non-indigenous people he says: "your Father [i.e., The Crown, His Majesty] says through me on this Subject, His Red Children and his White, are equally entitled to his Care and Protection, and He is disposed to render equal justice to both. He cannot by the Laws of the Land prevent white people from going through the woods, or killing a Bear, or Beaver where they meet with it." He warns the Algonquin by threat of capital punishment and cites as example a case where the two Abenakis men who were tried in Quebec for the murder of two Americans in a conflict over deer hunting. "For your Father is bound by duty to our Common Father across the Salt Lake, [Atlantic Ocean] to punish the Children who may be disobedient, and if any White Mans [sic] life is lost, for killing a Beaver, the red children by whom the act may be committed, must and will be punished […] -and if found guilty will certainly be hanged – Let this be a warning to you all." He then addressed the more complicated matter of Algonquin land claims and acknowledged the Algonquin of Two Mountains (Oka) have no land from which they may derive their exclusive enjoyment, compared to the Iroquois or other Nations. He tries to pressure them to accept a small tract of land if they "follow the example of the White Men" and take up agriculture (ibid.).[88]

> "I know that you of the Two Mountains who have no Land of your own, like the Iroquois of the Sault, and St. Regis, or the Abenaquois of St Francis from which money (or Revenue) is derived, will say your situation is worse than that of your Brothers, and that in years to come when your Hunting Grounds are all settled by White Men you must starve. – But this is not so, if you are disposed to follow the example of the White Men, who are settled around you, your father will give you the same

[87] Transcript of Gen. Darling's address to Indian Chiefs. (NAC RG10, Vol. 20: 14240-14253)

[88] This must also be viewed in light of English favouritism for the Iroquois who were relocated to villages along the United States border on St Lawrence in the event of further war with the Americans. The Iroquois, longstanding and former allies of the British, were considerably more successful at negotiating and receiving land for their exclusive use. In contrast, the Algonquin received nothing.

> advantages they have received – A Small portion of Land will be granted to each family for the purpose of agriculture, but he cannot grant any tract of Land to be kept in a wild state as Hunting Grounds."[89]

By the 1840's William Commanda's great grandfather, Antoine Pakinawatik was the Chief of Oka and approximately 350 Algonquin who lived there decided to leave Oka for good and take up permanent residence at their winter hunting grounds in River Desert (Kitigan Zibi / Maniwaki). And thus began the long process once again of petitioning the government (the Province of Canada since Upper and Lower Canada united under a new parliament) for title. In 1851, after making three trips by canoe to Toronto, to negotiate with members of parliament Chief Pakinawatik was finally able to get the government to issue an executive order authorizing the setting aside of lands (not in excess of 230,000 acres) for the sole benefit and use of the Algonquin Nation. [90] In 1853 John Rolph, Commissioner of Crown Lands, dispensed 45,750 acres in the Township of Maniwaki (Mary's Land in anishinabe) as 'reserved lands'.[91] This was only a minor victory.[92] Most Algonquin were displeased by the creation of this reserve since it was nowhere near their own family's traditional hunting grounds. The only Algonquin who took up residence in Maniwaki were the those whose families already habitually hunted in the area. Faced with continuous pressure from settlement and resource extraction and environmental degradation on an industrial scale, other Algonquin bands also petitioned the government for reserved lands on their familiar hunting grounds, however, most petitions were summarily denied since officials would continually re-direct them to go live on the small reserve at Maniwaki or Timiskaming.

Comparatively, the Algonquin First Nations have very little reserve lands. Currently there are ten Algonquin communities. The largest community remains River Desert (Maniwaki) with

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[89] ibid.
[90] Statutes of Canada 14-15 Victoria, chapter 106 (Registration Number 3751-105)
[91] (Registration Number 15565) These 45,750 acres would then be continually eroded as the Government of Canada imposed the surrender of reserve lands for various projects (e.g., Oblates Mission ground, or a railroad line). Currently Kitigan Zibi is about 43,000 acres in size.
[92] This is barely one tenth of one percent of their traditional territory of the Kichesippi watershed, which straddles both sides of the Quebec / Ontario border encompasses nearly 148,000 square kms. To put that in perspective, an area greater than the size of England -at roughly 130,000 square kms.

approximately 43,000 acres. The Timiskaming reserve, set aside as part of the same process with Crown Lands in 1851-53 was originally slated to be 100,000 acres in size. It is now down to 5,000 acres and has also been eroded through various surrenders (Morrison, 2006: 1). Golden Lake is 1,750 acres; Lac Simon, 800 acres; Abitibiwinni, 225 acres; Barrier Lake (Mitcikinabik Inik), 59 acres; Eagle Village (Kebaouek), 53 acres; and Wolf Lake, Long Point and Kitcisakik have no land at all (ibid.).

The Algonquin have been pushed to the margins of their territory and live in 10 communities with meager land resources less than a fraction of (not even one tenth of 1%) of their original territory. Their resistance and refusal to surrender their lands, puts the Algonquin in the unique position of having one of the strongest legal land claim cases in the country - encompassing, the national capital region of the Ottawa Valley. Pursuant to the Proclamation of 1763 enshrined in the Constitution of Canada the Algonquin's Indigenous title to the entire Kichesippi watershed remains unequivocally unceded and intact.

3.7 – Harvesting Bark in Colonial Landscapes

Though the cultural practices of Indigenous men and women were crucial to the economic enterprise of the French fur trade and military campaigns they remain frustratingly obscured in the written records that are primarily concerned with commercial trade, military campaigns, missions, and settlement. While these records attest to a high degree of cooperation between local inhabitants of the St Lawrence and Ottawa River Valleys and Eurocanadian settlers, there is never a mention about how Indigenous people practiced their skills or competencies. This can give the impression that canoe builders simply deployed a skillset of innate, naturally acquired, harvesting techniques and returned home with canoe bark in hand. Perhaps activities that appear to be seamlessly engaged in the happenings of everyday life seemed automate and mindless and rendered them unworthy of further remark. Nowadays, the traditional practices of harvesting

bark are much farther removed from common knowledge; thus situating these cognitive achievements within a context of our material engagements becomes ever more imperative to understanding the diverse ways that landscapes and memories are intricately linked to a meaningful past.

It is the third week of June and bark harvest season is just ramping up. Chuck and I make plans to overnight in Bancroft, Ontario a few hours' drive from each of our homes so that we could get an early start in the morning to look for bark. At the local breakfast spot, we meet Krista, the environmental coordinator for Curve Lake First Nations and we fill up on coffee and greasy breakfast stapples of bacon and eggs and potatoes. A little farther up the road in Maynooth, we meet Wesley, a forestry surveyor with the Ministry of Natural Resources. Chuck had asked Wesley if he could keep an eye out for mature straight birch while he was out flagging boundary lines of cut lots that are slated to be cleared next spring. In recent years the Bancroft Minden Forest Company has decided to allow Indigenous people to harvest a few birch for canoes before the heavy equipment roll in to clear the rest of the forest. As good canoe bark becomes increasingly scarce, there are now a few Indigenous people vying to be the first to receive the call from the surveyors and the logging companies. Krista confirms that at First Nations communities at Pikwakanagan (Golden Lake) 80 km to the east and Curve Lake 120 km to the south, there is no more canoe bark left in the immediate vicinity of the reserve. We follow Wesley north of Maynooth down the logging backroads for a good half hour until he pulls off onto the edge of the road as it widens into a bend. Chuck has found that learning to navigate the bureaucracies of state institutions who monopolize forestry resources on Algonquin territory is also necessary if he wants to secure the bark he needs to build canoes. Wesley loads up an ATV 4x4 with a chainsaw and a jerry can of gas and invites us to put our packs and gear in there as well. We follow him on foot up a trail that is marked every so often with bright red flagging tape.

From a distance the eye is drawn to its unusually smooth glistening white bark. Immediately this sets it apart from any other species of tree. Simply walking around the woods with an ax to swing would not lead one to know which of these trees is good for canoe bark. But the moment one takes up the experience of knocking the blade into the side of the tree, the potential for making connections with long-lost ancestral memories get resoundingly more interesting. Stand still for a moment and you can listen to the shedding scrolls of dry parchment clamouring in the early summer's breeze. Large panels cling inverted to the trunk before exfoliating and falling off. My best guess would be that birch are like lizards whose skin can no longer stretch to accommodate their growing size. Once on the ground these curls of bark weather remarkably well and after many snowfalls and spring thaws they resist rot and decay. The same is true for an old birch that falls dead in the forest. It may find its wood completely eaten and hollowed away, but its rind remains in a tube true to the form that once was there. A birch that falls into water may be resurrected intact with the innards dissolving into a blackened sludge. There is not another bark in the forest that comes close to holding its cylindrical shape years beyond the life of its tree. I am told it is high in betulin up to 20 or 30% its dry weight, which is a triterpene with powerful antifungal and antimicrobial effects. But the bark we have come to know for canoes does not give up its secrets so easily.

Fig. 13. Birch fell over a ledge completely hollowed

It isn't long before we are in an area with several large mature birch. Chuck makes a little test incision and then removes a little rectangular piece of bark and begins to bend it back and forth

in his hands. Often the bark of mature trees will be dry and brittle like parchment and delaminate. Bark that comes apart into thin layers is referred to as paper bark and is unsuitable for canoes. I notice when Chuck pulls at the fibres of the bark it tears around its waistline with a horizontal grain whereas other bark rips towards the sky and that this impermeable bark that envelopes the tree is so tightly wound, it needs little eyelets to breath. These little windows of waxy membranes, also known as lenticels, exchange gases and oxygenate the cambium layer beneath without compromising its waterproof qualities. Cut a small piece away from the trunk and most of the time it will be dry and delaminate into thin layers like paper but continue to persevere and hit the right tree and it can be moist and buttery, pliable like neoprene or thick like the leather soles of shoes. Chuck bends the test sample to and fro to listen whether it cracks with fatigue and if it sounds dry and brittle with lenticels popping and bursting at their seams. We wonder why rare birch with clean quiet bark congregate in small clusters among their more populous parchment-like cousins. We venture a guess at a few theories about genetics or micro-climates, but we will never quite know for sure. What we do know is the quiet intactness of quality canoe bark is as sweet to the ears as

Fig. 14. Chuck testing the bark

its pliability is to the touch. Birch are ripe and overflowing with wisdom if we open ourselves up to listen and feel.

The intensity of the biting insects reminds us that future bark reconnaissance should be done in the shoulder seasons of early spring or fall when the weather is cooler and we are less likely to be molested by bugs. Seasonal cycles don't only affect the insects, but also the bark. Bark that is harvested in the cooler seasons yields a more coveted type of bark that is valued slightly higher by the Algonquin canoe builders in the region. Summer bark, for example is honey blonde in colour and is typically harvested in June, July, and August when the sap is flowing. Winter bark, which doesn't benefit from the flowing sap underneath, is more challenging to peel but comes with an extra thin membrane that oxidises to a deep rust colour and allows for decorations to be etched in it. Chuck's preference would be for all his canoes to be decorated with animal spirits but because he usually builds 5 or 6 canoes per year, he must make some concessions and inevitably some of the canoes are made with bark harvested during the warm summer months.

Looking for bark on the east side and thus just outside the boundary of Algonquin Park is a search strategy that warrants further explanation. The default position of Provincial Parks (and National Parks) is that harvesting plants and trees within the park is prohibited. And yet, to believe that the park was born out of the desire to preserve the natural landscape for its own sake would be naïve and misguided. In the late 19th century under the auspicious banner of conservation, private citizens -- mainly sport anglers, hunters, and furrier associations -- lobbied the Ontario Government for a wilderness area to be set aside to safeguard fish and wildlife stocks (Killam, 1993: 6). Their efforts led to the creation of the Ontario Game and Fisheries Act (1892), and in the following year a wilderness preserve called The Algonquin Park (Altmeyer, 1995: 96-118). Conservationists also argued for the protection of tree species, but it was never the provincial

government's intention to sacrifice timber revenues (Huitema, undated: 50).[93] Logging continues within the park at an alarming rate.

The conservation movement coincided with a growing antimodernist sentiment, which viewed the industrial revolution as not only damaging to the environment, but also responsible for the detrimental effects of alienating people from it. Jean Manore explains: "As people increasingly shuffled papers and fastened bolts, they lost the day-to-day contact with the environment that farmers or hunters supposedly enjoyed" (2008: 126). Another related concern was that urban lifestyles, particularly for young men, rendered them "helplessly soft and luxurious" and "unfit for the battle of everyday life" (ibid). Campgrounds and paddle routes within the park were prepared so that an emerging urban and leisure class could restore their psyches and physiques by getting back in touch with nature through wilderness experiences and canoeing. Meanwhile, the Algonquin people were forcibly evicted from the newly established park as state agents, including game wardens and park rangers, secured the activities of a select seasonal recreational clientele. The legacy of national and provincial parks is part of an ongoing colonial assault, which seeks to claim land and resources and extinguish competing interests upon which many Indigenous people's livelihoods are based.

The terrain, we are in adjacent to the Algonquin Park encompasses a huge lake called Bark Lake. This lake, situated along the upper Madawaska River, is the result of a dam owned by Ontario Hydro. The Madawaska, a tributary of the Ottawa River, used to be a fast-flowing river with wild rapids, and an artery of life for the Algonquin that inhabited the area, but over the last couple centuries it has been drastically tamed. The logging industry, with the assistance of government funding, began in the early 1800's to build slides, booms, and dams for sorting and triaging the trees before driving the logs further down to the Ottawa River to supply Upper Canada and the

[93]See also: Sayna Sadeghi, et al. "Logging of Algonquin Provincial Park" UBC Student Research on Environment and Sustainability Issues, 2015, http://environment.geog.ubc.ca/logging-of-algonquin-provincial-park

Royal Navy with timber. Later, hydro-electric generating stations were built to supply the burgeoning demand of the cottage industry in Renfrew Country for electricity. These dams turned land into lakes and in the case of Bark Lake put over 9000 acres under water as deep as 280 feet.

In 1894, Chief Peter Charbot (Sharbot) and a group of Algonquin requested a small parcel of land in the Township of Lawrence (which was also later incorporated into the park in 1911) be confirmed as a reserve, but their request was denied (Huitema, undated: 45). In 1896, Chief Charbot once again petitioned the government for permission to live near their traditional homelands beyond the boundaries of the park on the south east shores of Haye Lake in Sabine County on a tract of land he thought "Crown Lands should have no objection because the timber there was all cut off and it was now a wasteland"[94] The government maintained that the Algonquin should move to Maniwaki or Golden Lake where there was already land set aside for a reserve far away from the game interests of the park. This calculated plan was made clear by the recommendations of Mr. Simpson, the Superintendent of Algonquin Park, in a report submitted to Indian Affairs in 1895: "You know the predatory habits of these people, how they roam about, and how difficult it is to keep watch of their movements in the forest or to get them to recognize that a law which applies to white people, with respect at any rate to the killing of game, should be made to apply to the Indian, […] It would therefore be almost impossible to keep these Indians, thus situated, from hunting and trapping within the Park, […]."[95] To this day the Algonquin continue to be prosecuted under the Fish and Wildlife Conservation Act for hunting and gathering and exercising their right to practicing their traditional livelihoods in the Algonquin Park. [96] The Madawaska watershed remains dammed and flooded and fully settled by private landowners that line the lakes with cottages and the park, which celebrates the name of the

[94] Letter Peter Charbot, Algonquin Chief Letter (NAC: RG10, V2401 File 83-203: 11-02-1896) In Marijke Huitema, "Historical Algonquin Occupancy Algonquin Park" Report Prepared for Elders Without Borders, (undated): 47-48.
[95] Aubrey White letter (NAC: RG10, V2401 File 83-203: 16-11-1895). In *ibid:* 46.
[96] See: Ontario [Ministry of Natural Resources] v. Thomas Kohoko, Daniel Sarazin, Mervin Sarazin and Bruce Meness of the Pikwakanagan & Appeal Sarazin v. Ontario Ministry of Natural Resources [2009] O.J. No. 4145 Also: Grant Tysick of the Kinouchepirini Ontario Court of Justice, Pembroke, July 27, 2015. & Appeal Ontario Court of Justice, Pembroke, January 8, 2016.

people it displaces, remains heavily regulated and uninhabitable to First Nations hunters and foragers who endeavor to continue living with their land.

As we continue walking some other large birch trees draw our attention. By this time Chuck was starting to amass a small collection of 5 or 6 different bark samples that he has held onto and kept in his pocket. Comparatively these samples are evaluated against one another to help Chuck decide which one we ought to return to and harvest. When the bark has helped him make up his mind, we head back to the tree that possessed the best qualities to get reacquainted.

Before getting started, Chuck and Krista decide it would be appropriate to take a moment to say thanks to the creator for providing good bark. Chuck produces a small pouch from his bag and leaves a gift of tobacco at the base of the tree. He then scans the surroundings looking at the spacing of neighbouring trees and sizing up the lay of the land. In this location the direction he should fell the tree becomes obvious as he is not going to send it uphill or into the canopy branches of neighbouring trees. He takes a few minutes with his ax to clear the ground of brush and is mindful to not leave any sharp stems of saplings protruding so as not to risk damaging or puncturing the bark when the tree lands. Once the tree is on the ground Chuck makes an incision up the entire length of the tree with his pocketknife and begins to pry up at the bark with the flat edge his ax. He works the edge slowly a few inches at a time until he can get his fingers under the bark and then begins to use his hands. Krista joins in and helps Chuck push the bark gently off the tree. They work carefully as a team, with their hands up and down its length. What's interesting is even though Krista is a complete novice and has never done this before, yet she is able to jump in and participate without Chuck providing any verbal instructions. Sure, some might be quick to point out she is learning by observing and mirroring what Chuck is demonstrating. However, this is not really the case. It is not because Chuck is bent over that she too is also bent over to peel the bark. It is because the tree has fallen at knee height as it lays along the ground that she is obliged to structure her actions in much the same way that mirror what Chuck is doing. Her

body's engagement with the birch bark is in direct response to the tree and its position in the forest much more so than anything Chuck is doing, In fact they aren't even looking at each other or talking, yet their activities are remarkably co-ordinated. Similarly, it is the bark that guides her hands and not because she is copying Chuck in any regard. This can be keenly observed when occasionally, an audible crack is emitted from the bark to tell her to be gentler. A crack also alerts her attention to a small tear that occurred at the edge of the bark. These tears usually happen at one of the lenticels and if left unattended could run and carry forward many inches, possibly ruining a good sheet of bark. The sounds of the bark implore her to exercise caution and to treat it with greater care.

Fig. 15. Krista and Chuck peeling bark

Once the bark was peeled completely off the tree, we all help to slide it out from under the trunk and gently turn it over with the exterior white side facing up towards the sky. Starting at the base of the tree where the bark is widest, Chuck begins roll it up, so it is more manageable to pack up and carry out of the woods. Nature's design with the unique feature of birch bark having a

horizontal grain, certainly aids tremendously in this regard. Krista was in awe to see that the skin of an entire birch tree could be rolled up so neatly and easily transported out of the woods on foot like this and for the first time she was able to feel connected and a part of the living experience that had occurred between her ancestors and birch trees since time immemorable.

Fig. 16. Birch bark roll

Throughout the harvest I observed the manner in which the material affordances of bark, directly shaped the scope of possible actions the human body can interact with it. In this sense, bark truly cooperates to guide people - even novices- through the harvesting process. If it is fair to suggest that humans have embodied memories that guide them through their skills, it would then also be just as fair to suggest that the memory of birch bark through its own material properties and affordances has also a memory to the bark that participates in co-constructing canoes with its builder.

The following week, I wanted to get a feel for the territory where Chuck's grandparents would have gone searching for bark and get a better idea why Chuck might be driving eastward a few hundred kilometers near Bancroft on the Madawaska watershed instead of north on the Kiji Sìbì into more familiar territory where his late grandparents William and Mary Commanda lived on the reserve in Kitigan Zibi (near Maniwaki). After a long drive north of Montreal and just as the sun was setting, I met a local man whose car had broken down on the side of the road. I stopped and offered him a ride back to Rapid Lake. He recalled the days when many Elders in the community were building canoes and he offered some tips on where to go look for bark. He suggested that if I wanted to find forests that hadn't yet been disturbed by the logging industry, I could borrow a canoe to cross over to some of the islands in the middle of the Cabonga Reservoir. The idea that these are the only stands left untouched by the logging companies, impressed upon me how dire the deforestation has become. I inquired: 'If I find a good tree, who should I ask for permission to harvest it?' He said, 'Oh if anyone asks just tell them you need some bark; they might think you're working for a logging company since you're not from around here, but just tell them you want bark for a canoe and you should be alright.' His advice reflected the history of colonial encroachment by logging interests, and the duty the Algonquin have to care for their land and protect it from ecological destruction.

This man, who showed me a great level of hospitality, was Jean-Maurice Matchewan, whom I later found out was the former customary chief of the Algonquin at Barriere Lake (Mitchikanibikok Inik). I say "former" not because he was replaced under the customary governance code where the Elders get together and decide who is best suited to guide the community in maintaining their way of life. But rather, because in 2010 the Federal Government and their agents at the Department of Indigenous and Northern Affairs, flanked by armed police from the Sûreté de Quebec, set up a polling station on the outskirts of the community into which a mere 10 ballots were cast, and in-so-doing forcibly replaced the Algonquin's traditional way of governing with a newly elected band council by using an archaic section (74) of The Indian Act (Barriere Lake Solidarity -*Press release Aug. 11, 2010*). This was the first time this measure had

been imposed on a First Nations community since 1924, and yet the Federal Government's version is that they wished "to see their governance conflicts settled internally" (I.N.A.C., *Chronology 2009*). Under the customary code chiefs usually hold the position for life. Part of this logic is that it takes a lifetime to develop the wisdom of how to lead and deal with the colonial government's tricks (Pasternak, 2017: 164-6). Matchewan was chosen by the Elders because the community needed an intelligent and fierce leader who could defend the Algonquin and their territory from clear-cutting while also navigating the negotiations with government. The Indian Act's provision for elected band councils, serves not only to bring Indigenous communities into line with settler models of governance and legislation, but it also ensures that there is constant leadership turnover with fresh ranks of inexperienced band councils that colonial governments can take advantage of (*ibid)*.

The Algonquin of Barriere Lake have never ceded or surrendered title to their land. Their territory of roughly 15,000 square kilometers encompasses the Verendrye Parc. In 1991, the Algonquin of Barriére Lake signed a Tri-lateral Agreement to develop a resource co-management framework that harmonizes forestry activities with traditional Algonquin practices. In 2001, citing "escalating costs" and "lack of convincing results," the Federal Government reneged on this legally binding agreement – an agreement which the United Nations touted as an environmental trailblazer and model of co-existence (I.N.A.C., *The 1991 Trilateral Agreement*). The Algonquin continued to negotiate with political officials and tried to develop better relationships with the logging companies (Canada *Report* R.C.A.P., 1996: 733). The illegal logging continued, sometimes under armed police protection. When the Algonquin organized peaceful protests, they were beaten, doused with tear gas, and arrested by riot police. In 2008, the Crown sought a 1-year jail sentence for acting chief Benjamin Nottaway to "send a clear message" and to "make sure he has no desire to do this again" (Barriere Lake Solidarity -*Press release* Dec. 10, 2008). A Quebec judge sentenced him to two months in jail for his role in organizing the protests. The government continued to issue clear-cut permits, including at Poigan Bay, a sacred location on the late customary chief Harry Wawatie's family lands. When his children sought a court injunction and

set up a camp to protest the illegal logging they were also arrested and charged (Barriere Lake Solidarity -*Press release* Aug. 21, 2012). Despite a resolution by the Assembly of First Nations to support the Algonquin of Barriere Lake and make efforts to get the Canada Reconciliation Process moving forward, the Federal Government remains embroiled in court battles while simultaneously in breach of their own legal obligations (AFN, 2015).

I asked Jean-Maurice if I were to go up to Barriere Lake if he thought I'd have a better chance of finding any bark up around there, but he said it might be worth having a look and that he remembers some Elders going to harvest bark right around the dam, but the whole area is being ripped up and cleared by loggers. I decided to check it out anyway, just to see if I could get a feel for what may have made this area so special to yield so many rolls of bark for previous generations of canoe builders including Chuck's grandparents, Basil Smith and Jocko Carl. Sadly, the lake is now attended by heavy machinery and the extent of the deforestation was disheartening. No longer could the Algonquin walk among the trees and feel their cool shade. It was a huge mess of upturned roots, discarded and rejected wood and sun-parched soil, which would swallow my entire leg if I lost my footing scrambling over their spoils.

3.8 Discussion

This chapter invites readers to question some of the most basic assumptions on how memory is operationalized. The aim was first to draw our attention to the historical context and conditions under which the Algonquin have had to learn to navigate the relationships with the natural world within an increasingly colonized landscape. And second to underline the ways that the material world is not merely external stimulus of context for our mind, but also to consider for a moment how it is very much a part of it. Humans learn to use the environment and natural resources to construct their life-worlds. Over time what appears to be external becomes very much integrated and psychologically constructed as part of our extended cognitive ecologies. While the 16th and

17th centuries presented the Algonquin with new opportunities to experiment with new modes of living and engage in new forms of cultural exchanges and practices along the St Lawrence River, the 18th and 19th century reversed course and saw their cognitive life-worlds vastly diminished through the forced relocations to a tiny fraction of their territory. This is what Paula Sherman alludes to when she says the Algonquin were cognitively colonized. Sutton concurs and writes about mnemonic geographies as such: "When customary places are destroyed or disrupted, or when individuals, families, or entire groups are forced off their land or out of their homes or cities, the consequent loss and alienation has many strands. Displacement can overwhelm social bonds and the integrity of the person or group. In the extreme, the traumas of displacement are cognitive and affective as well as practical and economic, because place is so deeply integrated into mind and memory" (2020: 3).

As archaeologists we share a stake in the enterprise of thinking critically about memory. The very nature of our field is invested in theorising about the ways in which the past is constructed and reconstructed. While MET complicates the alleged self-centered models of memory that lean too narrowly on a notion of mind constrained within the human body; an Indigenous ontology also suggests that human memory is indeed enactive in the extended networks of the cognitive landscape. While the topography and natural contours of the forest undeniably guide the sensory experiences of canoe builders; the colonial landscape acts as a persistent mediator that continues to shape the embodied practices of the Algonquin. Searching for bark nowadays is about learning to navigate the seasonality of the harvest, as well as the various land titles grounded in English and French concepts of property law. Walking down the hillside into the depths of the shady gully also means circumventing the scars of clear-cutting. The scorching summer's heat, that is intensifying due to climate change, is felt by all of the inhabitants of the forest; the bark is drier like parchment, and the birch are weakened by disease and dying prematurely. The yellow birch, which is unsuitable for canoe bark, is also responding to climate change by migrating northward into white birch territory. Flooded lands are given natural names like Bark Lake to disguise their artificiality. The state has been using forced relocation, political interference, and violence, to try

to silence Indigenous people as they assert their right to co-exist, while factories have been turning entire forests on unceded Indigenous land into pulp and paper, cheap chipboard, and popsicle sticks.

Engaging with the materiality of canoes provided an access point through which I became both observer and participant in colonial state ideology. The more I experienced in my bones what it was like to harvest a tree from the forest, to hold an axe or crooked knife in my hands, and to transform bark into canoes; the more I began to have doubts about what exactly I had convinced myself I was doing. I wondered how my own actions, replicating canoes that are recognizably Indigenous, might also be complicit in reproducing patterns of structural violence. On the one hand, harvesting bark allowed me to gain specific sensory insight into the forests, the tactile workings of materials, and the culture of canoe builders, which I knew so little about. But on the other hand, there's an arrogance in the assumption that Indigenous land would be available for me to explore and that First Nations' material culture could be unproblematically appropriated in my own reproductions of their processes. How different really is this behaviour than the other classic settler assumption that the Canadian wilderness is out there, available to use at our disposal? Furthermore, what privilege did I benefit from as I mobilized the services of state institutions: when I studied the collections of canoes in museums that profit from the loss of Indigenous cultural heritage, when I asked the Ministry of Natural Resources for permission to harvest on Crown lands that were unceded Algonquin territory, and when I was able to drive unimpeded on roads cut right into the heart of Indigenous territory. Or the privilege of becoming a student at university, which gave me the time and funding I needed to be able to incorporate gathering materials and building canoes into my research practice. The story of building canoes in Canada is also the story of Indigenous / settler relations.

Canoes have crossed into cross-cultural spaces. Chuck was very generous in sharing his wisdom and his skills in the bush and in canoe building. But, what happens to Indigenous knowledge when

it is passed on, carried, and practiced by non-Indigenous people? Indigenous people are powerful agents, disseminating their knowledge over a variety of different media and capable of deciding with whom to share it. Indeed, many people I've met over the years have developed close relationships working with Indigenous communities and often (though not always) learned their craft from and alongside Indigenous people. A generous reading could highlight the multiplicity of meanings that emerge among various actors at different stages of engagement throughout the process of making and re-creating. After all, cultures have mingled and interacted since time immemorial and the nature of all knowledge that is produced through cultural exchange is syncretic. But syncretism and multiculturalism also have a particular liberal Western history that has been used to mask the conditions under which the dominant culture appropriates and assimilates Indigenous knowledge. Once this knowledge is passed on to non-Indigenous people (who in turn become connected in the ways this knowledge is shared) then it becomes a different kind of knowledge altogether. My own embodied practice, though informed from a meshwork of both Indigenous and non-Indigenous sources, is not directly connected to an ancestral lineage or deep understanding of the communities from which much of this knowledge comes. If anything, my own apprenticeships and building and harvesting practices – arising from a secular, and largely pragmatic interest in craft and in material knowledge – are undertaken in a completely disparate set of cultural experiences. Yet for Chuck, the value of practicing canoe building is not so much for its re-creative potential but rather for its ability to reconnect him with the cultural practices of his ancestors while simultaneously responding to the entirely new context for cultural exchanges that his practice opens up.

The compelling politics of canoe building is that it has always been a site of social gathering where the construction of canoes responds to the projected needs of the not so distant future. As such it has the potential to create a powerful space that draws people from all nations into productive collaborations based on our shared and also disparate experiences. It provides an opportunity to question some of our assumptions about the ways that cultural memory is transmitted and to model and imagine other ways of being and inhabiting the world.

Optimistically, canoes can help shift our sensibilities, and lead to new understandings of the ways in which cognition is intimately linked to the territory and landscapes we inhabit. After all, in harvesting bark and building canoes the senses are not just immediately re-attuned to the forest, the trees, and the bugs; but also, to the people, their histories, their memories and the Indigenous and colonial legacies of this place.

Chapter 4

Listening to trees: What do forests know about canoes?

4.1 Introduction

My thesis uses a Material Engagement approach to investigate how the senses support procedural skills memory. This chapter studies how skilled agents use sound as a mnemonic device in cross cultural contexts. Drawing on a case study of birch bark canoe building, I explore the multiple meanings of sound from the phenomenological aspects of aurality – the subjective perception of hearing and listening – and from the acoustic features of landscape arising from its formal material properties. The ethnographic evidence I present in my thesis works through a Material Engagement Theory framework, which is in part influenced by Bateson's (1972) ecological theory of mind and Gibson's (1977) direct perception and material affordances. However, the specific aim in this chapter is to develop an anthropological study of sound that aligns closer to Schafer's (1993) concept of the "soundscape," to consider how the sonic environment is understood by those who live in it; and to Feld's (1996; 2005; 2015) notion of "acoustemology," which treats "sound as a capacity to know and as a habit of knowing" (1996: xxvii). As Malafouris points out: "Understanding how external resources matter (causally and ontologically) for memory in their own specific ways emerges as a major challenge for cognitive archaeology and for material-culture studies." (2013: 83). I use sensory apprenticeship as research method as I acquire skills and sensory knowledge along with the Algonquin canoe builders and I document the process through conventional data collection techniques such as, participant observation, note-taking, interviewing, photography, video, and sound recordings. I conducted fieldwork in two intervals of about a month each, in which I apprenticed with Chuck Commanda from Maniwaki, Quebec (*Kitigan Zibi*). Together we made three Algonquin birch bark canoes.[97] Each canoe requires approximately one week to harvest the materials and three weeks of steady teamwork for construction.

[97] The canoes were built in Ontario at Smith Falls District Collegiate Institute and Sacred Heart Secondary School in Stittsville as part of the Ontario Ministry of Education's new curriculum requirements and Indigenous Education Strategy. A third canoe was built at Murphy's Point Provincial Park.

Harvesting bark is an integral part of seasonal life and local knowledge for the Indigenous people who inhabit the Woodlands and Boreal Forest. The ethno-botanical evidence of birch bark harvesting and basket making among First Nations can be found in abundance in the archaeological record from 2,400 BP onward. There are a few earlier examples of basket fragments that push this record back farther to around 6,000- 4,500 BP (Croft & Matthews, 2013: 88).[98] In many respects, the skills that are employed to make wooden-rimmed bark baskets used for containers scale up to larger rimmed vessels used for floating people on water. Prior to the 20th century, the Algonquin lived in small bands as nomadic hunter-gatherers in the watershed of the *Kichisippi* (Ottawa River). Building canoes requires, patience, skill, knowledge, empathy and sensory awareness. These attunements flow from the physicality of situated practice on the land. Traditionally a family's canoe is constructed from the materials in the immediate surroundings of their home. The birch bark, cedar and spruce root, which make up the canoe, materially connect the Algonquin to their territory and to one another -a point that is further re-enforced when some communities remain only accessible by canoe.

The canoe teaches about the four sources of intelligence -emotional, physical, mental and spiritual. - In the Algonquin language, this is called *Ginawaydaganuc* - a principle underlying Algonquin law that outlines human responsibilities, not just to each other, but stemming from the interconnectedness of all living and non-living beings (Commanda *et. al.*, 2019). These responsibilities are passed on with *nindoodemag,* which passed on clan identity and descent as well as the Seven Grandfather Teachings, and the values of "respect, honesty, truth, wisdom, bravery, love, and humility" (Betasamosake Simpson, 2008: 33). The natural environment coalesces in all spheres of the Algonquin way of life. Their culture is incomprehensible without constant reference back to nature. As Leanne Betasamosake Simpson, Nishnaabeg activist says: "Our relationship to the land itself generates the

[98] The oldest piece of birch bark on record and associated with human activity in North America is found at the Medowcroft Rockshelter in Pennsylvania, USA, where a charred and carbonized cut strip (perhaps a fragment from a basket, but inconclusive) has been dated to 17,000 BP.

processes, practices, and knowledges that inform our political systems, and through which we practice solidarity." (Coulthard & Betasamosake Simpson, 2016: 254)

Previous research on landscapes and memory among the First Nations has emphasised land and territory as mnemonic hooks upon which oral histories and narratives can be hung. The book "Wisdom Sits in Places" by Keith Basso explores how the Apache use spatial anchoring as a technique to remember traditions. When travellers arrived at a place, the Elders would share the stories that reside there. Geographic features would later serve to help them remember these stories when they travelled back to these places again. These stories contain important directives relevant to identity, history, kinship, biogeographical distribution of game resources, and moral guidance. Some place names, Basso recounts, are "like arrows" that act on people like they have been shot and "wounded until the real force of the story is assimilated or acted upon" (1996: 60-61). Simply mentioning the name of a place in someone's presence would let the lesson in the story work on their mind and may cause them to realize their error and correct it.[99]

While Basso's research demonstrates how memories can be embedded in place, it relies on explicit forms of declarative memory like narration to do the heavy lifting of transmitting inter-generational knowledge. It treats landmarks as icons and landscape as archival repositories and its emphasis on narrative practices undermines the complexities of relational practices between minds, bodies and materials. In this view the skilled actualization and embodied interface with the materials have a limited role to play in transmitting memory. By focusing too narrowly on the articulated voice, I think Basso fails to follow through on the real implications of just what exactly the emplacement of memory implies. He and others miss, or fail to see, the opportunity to develop a theory about how memory is re-activated through our material engagements and how memories are stirred up by the sounds (voices included, but not limited to) generated through the embodied experience of travelling over

[99] Many thanks to Tom Andrews, Archaeologist at Yellowknife for his discussions with me of Basso's work

landscapes. My long-term fieldwork studying Indigenous birch bark canoe building in Canada has enabled me to observe and experience the ways in which memory is engaged by multimodal sensory pathways.

In my experience working alongside First Nation canoe builders, the Elders would often say, "listen to the wood." The wood itself has an agentive capacity to teach and guide our actions. Over the course of my apprenticeship this theme would repeat itself in a number of guises, for example, when an Elder would say: "the voices of our ancestors are inscribed on the land"[100] (also: Holmes, 2000). It became obvious, even to a novice, that listening directly to landscapes and its materials was a highly valued way of knowing and mode of transmitting cultural knowledge. The Elders modelled an orientation to being in the bush that privileged direct sensory awareness as the main conduit through which the source of their knowledge and their connection to their ancestors arrived.

There were many prolonged moments of speech-silence where the sounds of the forest and our activity within it were given ample space and priority. Talking offered scarce punctuation of the soundscape, normally only as a matter of coordinating behaviour and expressing states of being in order to solve rather transitory problems, such as, "Hey, can you pass me that knife?" [101] At the Elder's urging to *listen*, my auditory attention tuned to the raw materials of the forest. I began to wonder to what extent the formal properties of birch bark, cedar trees and spruce root, which give rise to certain acoustic characteristics as they are being worked, carry forward the living memory and knowledge of Algonquin ancestors. In this paper, that question guides me.

[100] personal communication, John B. Zoe 2018

[101] Materially, a knife shares in cutting as much as it participates in the mnemonic know-how and procedural skill of how to cut. – just hold it the wrong way and it will readily teach you a lesson - giving credence to the profound epistemic potential a tool has in its own right to stabilize and transmit physiological behaviour over vast periods of time. But just how exactly the body remembers its skills involves so much more than just showing up to the job with the right tools. The role of epistemic tools will be taken up in further detail in the following chapter.

1) This chapter is divided into two parts. The first section excavates the sensorium through an analysis of the auditory dimensions preserved in the archaeological record of petroglyphs in Algonquin territory. I begin with a brief review of archaeoacoustics and the contributions that sound studies have made in the field of landscape archaeology. However, since the senses are ordered differently across cultures, (Howes, 2003; Classen, 1993) I attempt to escape the shackles of my own socialised ear, by exploring the documented differences of ways of listening through an interpretive ethnohistorical reading of Algonquin rock art along canoe travel routes. The purpose of this is to provide a comparative backdrop, against which the acoustic dimensions in the contexts of collaborative canoe building with the Algonquin and researchers at the university can be better understood and appreciated.

2) The second section asks: What do trees know about canoes?[102] – Here I explore the concept of *mimesis* to investigate how ways of knowing can be deeply sedimented in nature. Mimesis has been used quite broadly in topics ranging from art aesthetics to early hominid evolution, psychology and linguistics. However, its root definition retains some of its original connotations of emulation, representation, and mimicry. Originating from around the 5th century BCE, *mimos* or *mimesis* described the theatrical performances of actors who dramatized everyday life. Gradually its meaning extended into literature, with Plato and Aristotle taking up *mimesis* to mean something 'similar' or an 'imitation,' like a fable or fiction. While Plato was concerned that mimesis gave rise to an illusionary world that belied reality; Aristotle saw the more positive and creative potential for humans to express and mirror what they observed in nature (Gebauer & Wulf, 1995: 28-29; Wulf, 2017).[103] I

[102] Contrary to Algonquin beliefs, one of the peer-reviewers was sceptical about the extent that humans may recover lost knowledge from our interactions with natural raw materials. In the second chapter, after laying some theoretical groundwork in MET, the extended mind, and concepts of cognitive-offloading Reviewer #1 stated: "As argued, it does not seem to be the case that experience and knowledge hang out in the landscape in some fashion waiting to be recovered" I've decided to embrace this critique and push my ideas and thesis further in this chapter with the philosophical concept of mimesis and the study of acoustics and resonance. I thank reviewer #1 for their comments.
[103] In Mike Mowbray's contribution "Mimetic Faculty" to *The Sixth Sense ABCDerium* (ed.) David Howes, explains that Plato's concern prompted him to call for limits to mimetic endeavors "as in the case of guardians of the polis, who were to avoid inessential craft-making, [and] effeminate conduct of the imitation of the sounds of nature." - Perhaps a double entendre.

intersperse ethnography of canoe building with Benjamin's notion of the "mimetic archive" and theory from the anthropology of sound to offer a new intervention in philosophical discourse. Ultimately, I propose the possibility that the human mind may possess underdeveloped sensory pathways that could be used to recover long-lost wisdom.

4.2 –Excavating the Sensorium with Archaeoacoustics

The growing field of archaeoacoustics or palaeoacoustics brings the more-than-visual sensory dimensions to the study of archaeological materials. The heard materiality of artefacts helps to re-animate the mnemonic links between bodies and the environment that are mediated by the sense of hearing. In Europe for example, the unearthing of musical artefacts, such as prehistoric bone flutes, has led to new research of past sounds (Acoustics and Music of British Prehistory Research Network; Scarre and Lawson, 2006; Mills, 2014).[104] The four main categories of sound-producing instruments include: "*ideophones*" such as, rattles, shell shakers, and lithophones; "*membranophones*" such as, drums or hoops covered with stretched skin; "*chordophones*" of bows or gourds with taut strings; and "*aerophones*" such as, bullroarers, whistles and conches; (Dams, 1984; Lund, 1981).[105] The emergence of musical behaviours such as emotive-tonal vocalizations are said to pre-date the appearance of instrumentation (Wallin, Merker & Brown, 2000).[106] Intuitively, people would have always been intimately aware of the intrinsic acoustic effects of the materials they worked closely with for example, the percussion stroke in lithic tool-making, the abrading of wood

[104] A recent find of a fragment of what could possibly be the earliest example of a bone flute found at the Divje Babe I cave in Slovenia is dated to 43,000 BCE (Morley, 2006). While the earliest instruments are typically from the Upper Paleolithic this example is remarkable because of its association with Neanderthals.
In the Saint-Laurence river basin in Canada, bone aerophones (flutes and whistles) begin to make an appearance in the archaeological record of the Paleoindian (9000 – 5000 BCE) -the first peoples to ascend into the region. One aerophone made from a lightweight bird's wing bone found at the oldest known burial mound in North America, a late Paleoindian site at l'Anse Amour dates to 5580 ± 180 BCE. It was found buried at chest-height (quite possibly worn around the neck on a lanyard) next to a pendant in the grave of a 12-year old boy. (McGhee, 1976; Martin, 1976) Aerophones remain present in Maritime Archaic Tradition (5500-1000 BCE) as attested by the many finds at Port au Choix (Tuck, 1976: 238).
[105] Categories cited from Steve Mills (2010).
[106] Emotive vocalizations can also be a communicative practice between species. Algonquin hunter gatherers are known to make simple instruments like a cone fashioned of birch bark to project vocal calls and lure game like moose and duck. Similarly, the crow is said to alert other animals of the presence of humans.

with a stone scraper, or the lacing of wet babiche onto a snowshoe frame. However, the rise in portable and mobiliary art such as animal figurines and musical instruments suggests that sounds were increasingly produced for the appreciation of their aesthetic qualities as well.

Studies on the sounds of prehistory also include research on the acoustic properties of archaeological spaces such as, rock shelters, dwellings, temples and monuments (e.g. Devereux, 2001; Folkerth, 2003; Till, 2009).[107] Here the working hypothesis is that the way sound resonates, reverberates, carries over distance or echoes in a particular location has important implications for influencing the selection of these sites and the behaviours engaged in while at these locations (Kolar, 2018; Lubman, 1998). Reznikoff & Dauvois (1988) were among the first to establish a 'meaningful connection between the relationship where cave paintings were located and the rooms where the most resonance was present.'[108] Waller went a bit further to notice that cave galleries with the highest echoic effect also have the highest visual representation of ungulates, suggesting that the production of percussive sounds may have been companion artistic practices, which resembled the stampeding hoofbeats of a galloping herd (1993: 501). Cave galleries where resonance is comparatively low either had feline art, (ibid.) or handprints and simple line-dot motifs, or no art at all (Fazenda et al., 2017).[109] Although, even still there are studies that argue the lines and dots may have been painted at strategic points of maximum resonance within these quieter rooms (Miyagawa et al., 2018). Additionally, some stalagmites and stalactites produce a vivid resonant sound, and some of these are also marked with red paint and exhibit wear marks from being struck (Hoffman, 2014). Miyagawa says, "the idea of a spirit world behind the

[107] "Gong rocks" occupy somewhat of an in-between category, since they are both musical instrument and immovable features of the environment. Recently identified in North America, for example at La Cloche Island, Ontario (translates to "*bell"* island in English) (see: Sacchetti, 1999). Gong rocks are played *in-situ* and were attended for their special musical qualities. Wear pattern analysis of the cupped or pitted pocks on the surface indicate that they were played by being struck repeatedly with small hammer stones, which are sometimes also found nearby.

[108] Early experiments used the human voice and measured reverberation time (RT) with a stopwatch. Later experiments sought more precise quantifiable data and employed digital technology to broadcast sine waves with controlled frequency and volume as the acoustic effects were measured using sound meters.

[109] Fazenda et al. is cautious and says that a statistical correlation doesn't necessarily mean a causal correlation. They point out that a statistical link can also be made between the absence of visual art and galleries that are located farther from the entrance (2017: 17).

surface of the rock could come from the acoustic property of echo" (2018: 5). In the context of European pre-history, the evidence certainly suggests that humans were attracted to and placed some kind of value on the natural acoustic sound effects of rocks and in caves.

4.21 Petroglyphs and Pictographs: Sounding the canoe landscape

> *My grandfather was alone chasing two Maymaygwessiwuk (little people or dwarfs) into a big sheer rock face. The Maymaygwessiwuk paddled right into this rock and my grandfather went in after him. There was a door in the rock and inside was a very large snake and this old man inside with long long whiskers. What are you doing here? I want medicine…. Then the old man gave my grandfather this medicine. He didn't remember going outside but found himself in his canoe, outside. His bag was still outside that had the medicine and the medicine was still in it. From that time on my grandfather knew different medicine.*
>
> *(Dewdney- Selwyn Dewdney Collection 1960-66)*[110]

Situated in the Canadian Shield, the Great Lakes region and its tributary waterways are considered to be the core zone of the Algonquin rock art phenomenon (Arsenault, 2004). Primarily found on rocky escarpments rising dramatically out of the lakeshores and river-banks, the practice of painting rocks appears to have been well integrated as a related activity with canoe travel. Dating rock art is notoriously difficult,[111] however, it is safe to say

[110] Cited in Zawadzka (2007)

[111] Dating Indigenous petroglyphs and pictographs has proved challenging. The following methods have yielded some results: stratigraphy, superposition, style analysis, weathering, lichnometry, water level markings, and ethnohistory. However, lychen growth could begin at any time much later after the painting and soil stratigraphy is not an option at sites above water. When there is underlying soil, it is not always accompanied by mobiliary artefacts, though fallen petroglyph fragments and paint droplets are sometimes found in the ground and can yield dates (see: Gordon, 2008). Ethnographic evidence suggests that red ochre paint was mixed with an organic binding agent, such as fish bladders or animal fat, which helped make the pigment resistant to weathering but other binders such as tree or plant sap may also bring up dead carbon matter from the soil, making dating inaccurate. Two sites stand out for their antiquity. The Nisula site in

that this was not just an Algonquin phenomenon, but a continuous practice that extends back among all hunter-gatherer cultures who have lived in this region (Zawadzka, 2007).[112] But what can the acoustics of petroglyph and petrograph rock art sites tell us about the cultural sensibilities of the Algonquin? The acoustic properties of rock art sites suggest the Algonquin use natural sounds as significant auditory signals to inform metaphors and mythologies. Rock art, at face value, can be interpreted as an expression of the Algonquin's spiritual beliefs. However, the ethnohistorical record confirms a deeper cognitive relation between geophysical icons and ecoacoustical properties to reveal an ontology of memory that overflows the material history to traverse through bodily movement into the auditory channel.

The Algonquin selected sites based on a combination of interrelated geophysical, emotive and spiritual considerations such as, the prominence of a rock outcropping when compared with other geological features in the vicinity (Norder & Caroll, 2011) and the composition of the rock face. A preference being noted for surfaces with quartz veins or white calcite deposits (Conway, 1993). Sites are almost always southerly facing, with Dewdney counting only 3 locations (out of hundreds) where the paintings wouldn't have had any direct sunlight. It would appear that the sunlight bouncing off the water casting shimmering reflections

Quebec, has silica skin deposits directly under the pigment of the pictographs, which have been AMS dated to 2,500 ± 275 B.P. (Arsenault, 2004: 356). And the Mud Portage site in Lake of the Woods, Ontario, has petroglyphs that were excavated under stratified soil levels. Diagnostic artefacts contained in levels 8 -12 were identified from the Archaic Oxbow complex, around 5000 B.P. (Steinbring *et al.* 1987: 8). Considering that the petroglyphs were found much deeper under levels 12- 23, which only contained "uniflakes" and "unmodified flakes", Steinbring bases a "conservative" estimate to the antiquity of the site of around 7000 BP (Steinbring, 1986: 140). Though, radio carbon dating of soil samples Steinbring sent for analysis to Brock University came back with dates of 1320 ± 80 BP. Steinbring later revises his dates to say they are "provisionally" between 9,000 and 5,000 B.P. (1993:22) (see: Colson, 2007: 145-147). Also, on the basis of stylistic comparison Reid (1979) finds that the Mud Portage site does not depict Archaic copper projectile points or atlatls like those at the Late Archaic Period (4500-3000 BP) Jeffers Site in Minnesota. At very least we can say that the practice of rock painting is continuous and spans multiple archaeological cultures.

[112] The predecessors of the Algonquin are considered to be the Woodland, Archaic and the Paleoindians cultures. The Algonquin do not make such taxonomic distinctions. Though their mythology refers to 'stone-age little peoples'. Other First Nations groups and Inuit also have similar oral histories of their predecessors who had a distinctive culture, lived in stone houses and had stone tools with different traditions and peculiar ways of life. Most of the time these mythological people are considered innocent, reclusive and harmless and they are believed to continue to live co-temporaneously among all the inhabitants who share the landscape.

directly onto the rock paintings was also a criterion that was at play (Rajnovich, 1981). Sites are also notably more prevalent near rapids, waterfalls or narrows (Dewdney, 1978). Such strategic placement of the art "forces" travellers along the canoe route to pay attention to them as the natural contours of the navigable passage brings people into close proximity (Arsenault, 2004).

In Southeastern Ontario, where the Algonquin woodland hunter-gatherers shared a border with the (semi-agricultural) Iroquoian cultures of the St Lawrence Lowlands, there are considerably fewer rock art sites. Just three (that are known today) to be exact. Yet two of these sites are the most prolific with the largest numbers of overall petroglyphs and paintings.[113] These two major sites also have the pronounced (and documented) presence of augmented acoustical features. (Conway, 1993; Steinbring 1992; Vastokas & Vastokas, 1973; Waller, 2000). "Mazinaw" Lake, which takes its name from "Muzinukigum" meaning "picture of painting" in Algonquin (or "Mishinog" meaning "a place of meeting") has 295 images painted in red ochre on 65 rock faces over a 2km stretch of the cliffs.[114] This site is located in modern-day Le Bon Echo Park aptly named by French settlers because of the way sound echoes with remarkable clarity back across the lake. [115] Here a 100m high pink granite cliff streaked with diagonal bands of black diorite rises vertically out of the lake with water 150m deep. The pictographs are located directly at the water's edge and are only accessible by paddling alongside them. There are no ledges to stand on or disembark and the height of the paintings indicate that they were likely done by people standing in canoes. On approach, the

[113] The third site is comparably small, but it is located near Gananoque, Ontario on a section of the river that has treacherous whirlpools. It is customary to offer a gift to the spirits at this site who guard your safe-passage (Chuck Commanda, personal communication 2018).

[114] Mazinaw Lake is also at the headwaters of the Mississippi River, which provides a route eastward through a series of Lakes on to the Ottawa River system. There is also an old trail from the north end of Mazinaw Lake to Weslemkoon Lake that gives access to the Madawaska River system. The archaeological evidence identified two sites on Mazinaw Lake, both of which point to seasonal occupation in camps at the tip of the Narrows and on the beach to the south. The first site is from the Mid-Woodlands period circ. 500BC to 800AD and the second site is Algonquin / Ojibwa with dates between AD 1680 and 1725.

[115] It would be hard to imagine a scenario where the first Frenchmen to paddle past to the base of the rock cliffs in a canoe -to be in a position to hear the echo- would have discovered the echoic effect independently without the company of a native guide. Samuel de Champlain was one of the first Europeans to visit the area in 1608, camped and hunted just south of the lake. There is no mention of this site specifically, but he was accompanied by a party of Huron and Algonquin hunters.

rhythmic slapping of the waves against the rock erodes into hollows and cervices that act like natural amphitheatres filling these little grottoes with amplified sounds that are likened to laughter, song, a beating drum, and a rattling paddle (Arsenault et al. 1995; Lemaitre, 1997; Norder, 2003).[116]

According to the Algonquin, the emplacement of the art is at the junction of the four layers of the universe; the underwater world of lakes and rivers, the earthen underworld of caves and crevices, the earth's surface, and the upperworld of sky and stars (Arsenault & Zawadzka, 2014: 121). The Algonquin believe the quartz veins were caused by lightning strikes and they incorporated these veins into the depictions of anthropomorphic, zoomorphic and supernatural beings (Conway, 1993: 89-90). Thunderbirds are depicted with their talons clutching bolts of lightning of reflective quartz that sparkle ever more powerfully in the sun (Zawadska, 2010: 709).[117] Serpents, drawn along the cracks dive below the water traveling between the earth and the underwater world. The quartz veins don't just become part of the art. They also serve to organize the overall parameters of the tableau. They can either split scenes or encompass them into various arrangements and associations between graphemes (Lemaître, 2008). The eternal battle between thunderbirds and snakes (with the superior level of guardian thunderbirds and inferior level of snakes) are often animated as a tableau with perilous canoe travellers caught in their midst. A

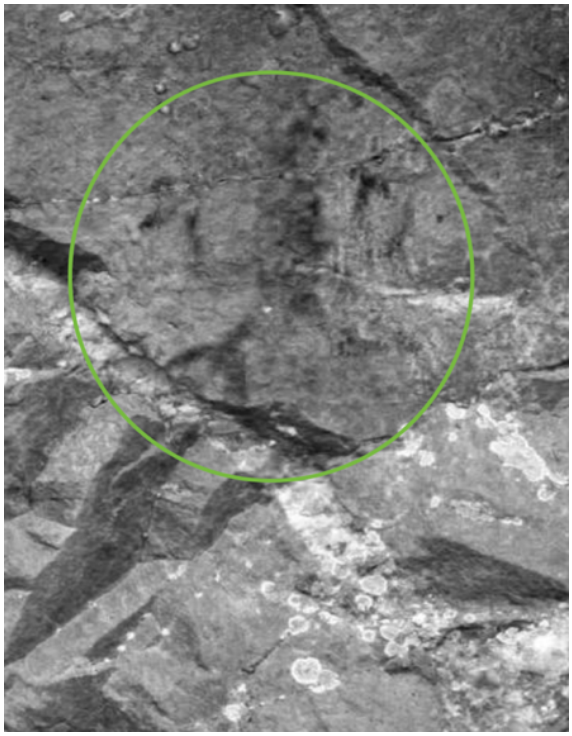

Fig. 17. Thunderbird clutching lightning

[116] In Zawadzka, (2007: 95; 2010: 712)
[117] One of the thunderbirds is named "the echo maker"

comparison of pictographs at other sites in Algonquin territory attest to the continuity of these material practices where the composition of the rock's natural morphology actually gives rise to the expressed beliefs in Algonquin spiritual narratives.

At the second site called "Kinoomaagewaapkong," which in Anishinaabe means "the rocks that teach," located near modern-day Peterborough, there are over 900 petroglyphs on a flat gently sloping slab of white crystalline limestone. Prior to its development as a provincial park tourist attraction, this relatively rare inland site of about 35m x 12m, was situated in a rough patch of difficult to access bush among other low-lying hills surrounded by lakes and marshes.[118] Inland sites away from canoe routes are associated with the vision quests of puberty fasting (Conway, 1985). Vastokas & Vastokas (1973) say, this site distinguishes itself, not by its view or vantage point, but rather by a large 30cm wide crevice that diagonally bifurcates the slab where the sound of an underground stream can be heard trickling deep within the rock.[119] They report that "perhaps even the voice of the *manitou* manifested in the trickling sounds of the hidden water [sounds issuing from a crevice" (Vastokas and Vastokas, 1973: 49). According to the Algonquin, the Manitou spirit is in all things, animals, plants, wind, water and rocks. The Kitchi-Manitou is the greatest spirit, the creator of the sun, the moon, the planets, and all living creatures.

Among the Manitou figures depicted in the petroglyphs and pictographs is a "rabbit man" called *Nanabush*, a cultural hero who provides guidance and safety.[120] (circled in green Fig. 19.) It is no small coincidence that the Nanabush has giant ears. Howes and Classen state: "A culture's ideal sensory model can sometimes be inferred from the sensory abilities and qualities manifested by its culture heroes" (2019: 33). The *Maymaygwayshiwuk*, who are good-natured, little people or dwarfs from a time long ago. The *maymaygwayshiwuk* aren't

[118] The nearest navigable water is about 1.5 km away.
[119] Vastokas offers dates for this site of Middle Woodland or Late Archaic Period (2004: 283)
[120] The *Nanabush* can also transform himself into many different characters – human and non-human. For an interesting illustration of *Nanabush* as three female characters see Tomson Highway's play "Dry lips Oughta move to Kapuskasing". *Nanabush* is also a cultural figure among the Ojibwa and Cree.

considered harmful but sometimes they are known to play tricks as they travel in stone canoes and steal fish from nets. The *maymaygwayshiwuk* who live in the rock escarpments are renowned for their medicine, which they readily trade for offerings of tobacco and fish (Dewdney Collection 1960-1966; Hallowell; 1975: 166).[121] Some sources say the *Nanabush* instructed the Algonquin how to paint, (Reid, 1964: 96-102) while other sources report that the paintings are done by shaman who paint the dreams they have when they are visited by Manitous (T. Jones, 1981: 72). And yet others report the rock paintings are accredited to the *Maymaygwayshiwuk* or little people themselves (Arsenault, 2004: 359; Désveaux, 1988: 265-266, Jenness, 1935: 42).[122]

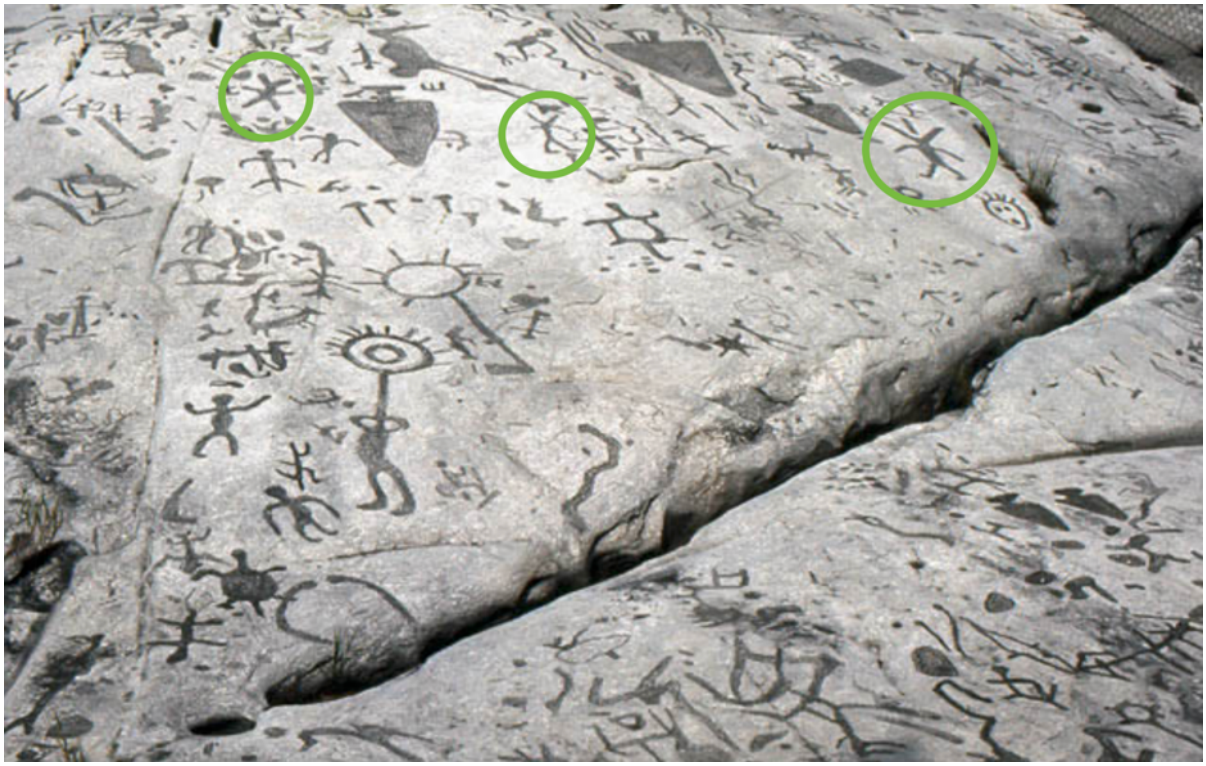

Fig. 18. Crevice at Kinoomaagewaapkong (Peterborough petroglyphs site)

[121] Maurice Barbeau records: A dwarf woman appearing before a Huron hunter from inside the hollow of a tree. This woman recounts a time long ago when little people had to climb to the tops of cliffs because the earth was drowned and covered with water.
[122] In Zawadzka, 2007.

The Algonquin believe that the *Nanabush* transformed himself into the echo at *Mazinaw* Lake and the trickling water behind the rock at *Kinoomaagewaapkong* (and other special sites) as a way of teaching man how to live. Cliffs and rock outcroppings are believed to be special spiritual venues, with caves and crevices being portals to the other world (Arsenault & Zawadska, 2014: 121) Dewdney writes: "in earlier times gifted shamans had possessed the power to dream their way into the living rock, to converse and even exchange gifts with these super-natural beings." (1970: 25) Barbeau writes: "These little beings are said to have left marks and traces of all kinds on rocks and are believed sometimes still to be heard singing and dancing in caverns or under the ground" (1914: 299). The echoic effect of the rocks, which mimics the voices of the canoers is also taken as an indication that the little people who inhabit the rocks are still up to their old tricks. Many Algonquin say that although the Manitou and the little people can still be heard they have now become invisible, whereas in earlier times they could be seen scurrying and disappearing into the rocks.

The idea that the source of the sound from deep within the surface of the rock is a portal to conversing with the spirit world is enticing. But the real significance here is that sound provides evidence of an acoustic epistemology where nature itself provides an auditory signal to offer a multi-modal way of thinking about the world. The enactive cognition version lies in the fact that sensing constitutes cognition through the active process of being able to constantly probe our surroundings for information. Only the difference here is sound is not just the medium through which memories or knowledge are transmitted, if it worked this way we would only need to wait and listen to what the environment tells us. Rather sound offers new possibilities for extending cognition because the medium itself has epistemic agency. Our ecological activity generates the sounds of what we need to know. The incorporation of the rock's natural acoustic features and the geomorphic inclusions and composition such as texture and fissures and crevices, into the rock art is evidence of an epistemological orientation to sound that is inseparably fused to its material form constituting cognition.

To the Algonquin it is apparent that there are no clear boundaries between the physicality of experience in these special spiritual places, the natural sounds that emerge from the acoustic features of the landscape, and the narrative of their belief system or mythology. As a result, I see no obvious or sensible location where materiality should end and stories begin. MET brings new implications for Basso's concept of spatial anchoring. The fluidity and plasticity of sound as a medium is especially conducive to collapsing memories into materials and mind. In a sense, nature overflows its boundaries spilling iconic and sonic symbols into our immediate circles of attention so that they not only provide a material grounding for historical narratives but also a dialectic of material origin for our thoughts. It is this epistemological orientation that is derived by listening directly to the ecoacoustical features in the environment where natural sounds and vocal narratives both indiscriminately 'speak' to the Algonquin. This gives rise to a way of being in the world that encourages multiple forms of listening, where natural sounds are fully canvased for what they are capable of teaching us about how to live.

4.3 What do forests know about canoes?

> The problem is not how to finish a fold, but how to continue it, to have it go through the ceiling, how to bring it to infinity. It is not only because the fold affects all materials that it thus becomes expressive matter, with different scales, speeds, and different vectors (mountains and waters, papers, fabrics, living tissue, the brain), but especially because it determines and materializes Form.
>
> (Gilles Deleuze, *The Fold)*

"What are you up to?", asks Chuck standing on the side steps to the Plenty Canada building. We had just returned from the Lanark Landing, a local eatery, bellies full and fingernails still packed with dirt after a day out gathering spruce root in the drizzly bush up the gravel road not too far from here. The rain has stopped but the warm evening air still carries with it all kinds of earthen

freshness stirred up from the soggy ground. “Want to split some more root?” he asks. Nightfall and mosquitos don’t signal the end of the workday around here.

‘We could set up inside the lodge’, he says, as he steps onto the porch and around the propane burner and large cauldron. It’s still tepid, containing some of the day’s harvest with 4 or 5 bundles of boiled reefs of spruce root waiting for us to peel. “Do you like music?” Chuck asks, as he kicks off his muddy shoes, slips into a pair of moccasins and goes to fetch a cable to plug his mobile phone into the portable stereo. He pulls two office chairs from the conference room into the adjacent kitchen and sets about peeling and splitting roots while listening to Def Leppard, Iron Maiden and Judas Priest. (fig. x) Time passes and the pile of cast offs grows steadily larger at our feet. “Have you heard of Link Wray? – you know *Rumble*” -Chuck asks, as he memes a bit of the melody, I nod vaguely. ‘You’d know it if you heard it’. That guy invented the power riff in the 50’s with gritty distortion’ Lots of people don’t know this, but Native people were there right from the start of rock n’ roll.’ Chuck says proudly.

Chuck and I are turning out sweet lengths of moist, fresh-scented, clear-capped, beautiful blond root lashing. But as we set aside our finished coils of root to dry on the table, our bundles are markedly different, less in their overall finish than in the presentation of the way they are coiled. Out of curiosity I take one of his tightly wound coils of root in my hand and ask him about it. He replies: “My grandma, she used to do it like this.”

He sections an arm-span of finished root and shows me how he winds it tightly around three of his fingers and loops the end back into itself five or six times to hold it in place. The logic behind the procedure isn’t immediately obvious, but after a while I switch over to his grandmother’s method. I pass it back to him and ask: “like this?” He turns it over a few times in his hand, sets it on the table with the others and returns an approving nod and a warm smile. I listen as Chuck

tells me: “It feels good, like I’m on the right path now. I know in my heart that building canoes is the right thing to do.”

Fig. 19. Chuck splitting spruce root

Sentience, as Benjamin writes, 'takes us outside ourselves.' But the notion that knowledge about canoes is hanging out in trees and landscapes waiting to be recovered is counterintuitive from a western academic standpoint. If we are to take seriously the implications of the inseparability of cognition with materiality then the philosophical concept of mimesis presents a fascinating and generative wrinkle for the ontology of memory.

Mimetic resonance is a helpful concept for its potential to communicate deeply sedimented memories. I employ it here to work through ethnography based on sensorial mnemonics. I use an anthropology of sound to shore up the slippery surface of mimesis as a concept. Such a practice offers a way to think about mnemonic flow that emerges directly from the sensorial fields of the acoustic qualia of materials, which give structure, meaning and memory to our interactions with them. I argue that humans' mimetic abilities to uncover sensuous similarities in objects, which have stable durational physical qualities, reveals new possibilities for thinking about how the body remembers its skills.

It is tempting to say, as anyone who splits root for more than a day will often remark, that you could almost do it with your eyes closed. This implies the work is all in the hands. But credit must be given to the material itself, whose pliable fibres travel as filaments along the entire length of the root from tip to tail.

Roots already possess the material affordances for splitting. The hands, at the periphery of this material/bodily interface, merely help to steer it along and keep it from running off track. So reproducible is this pattern in nature that my hands can do it, anyone's hands can do it, and yet placed in Chuck's hands what emerges is a highly personal story elicited out of the materiality

and manipulation of the root itself. In an essay published posthumously, critical theorist Walter Benjamin writes: "Nature produces similarities; one need only think of mimicry. The highest capacity for producing similarities, however, is man's" (Benjamin 1999/1933: 720). Though Benjamin's discussions are couched in 1930's debates about the origins of language (complete with the usual trappings of this era for stereotypes about the primacy of humans in the animal kingdom); he proposed that humans are predisposed with an innate "mimetic faculty" and he coined the term the "mimetic archive" to describe 'an archive of long-forgotten correspondences' (Mazzarella, 2017: 146). The idea centers around a theory of participation, activated through skilled actualization, where a connection to "deeply sedimented historical processes" can be excavated through "sensuous similarity" (ibid.). This participation with the mimetic archive is, as Mazzarella explains, "irreducible to individual psychology, since it is "stored" as much in the material world and in our innervated, embodied interface with it as it is "in our heads" (2017: 147).[123] Mazzarella seems to suggest, if the conditions of our attention are just right then powerfully constitutive resonances can begin to leak out across space and time (Mazzarella, 2017: 146).

In Chuck's hands, the root invokes a sense of purpose and belonging that connects him to a complex tapestry of intergenerational and interspecies knowledge-sharing. Indeed, especially with a last name of Commanda, he can certainly claim he comes from a long-lineage of Algonquin canoe builders. But how does his grandmother's root coiling technique fit in, if as a boy he did not have the opportunity to speak Algonquin at home because his father was sent to a residential school where it was forbidden to speak indigenous languages; and if his first bark harvest was not at her loving side under her tutelage, but instead alone in Gatineau Park as a clandestine operation fearing reprisal from the law. In his voice, there is an appreciable amount of introspection when he says canoe building has put him on the right path. For Chuck, the practice of harvesting and splitting root becomes a conduit to health and healing which aligns his activities

[123] This parallels well with theories about material agency where "Agency comes to be distributed across a network, inhering in the associations and relationships between entities, rather than in the entities themselves." (Knappett, 2002: 100) and the extended / distributed mind, where "neither the information nor the sequence of actions to be remembered need be explicitly represented anywhere" (Hutchins, 1995).

and knowledge with his ancestors. At work here the mimetic faculty activates (and re-activate) memories through shifting forms of engagement made similar (and dissimilar) by his body's recourse in its material environment.

4.31 Epistemology of the forest: beyond the sensuous / non-sensuous dichotomy

With the concept of mimesis comes the associated baggage of a lingering contempt towards language. The claim is that language has dulled and deafened our relationship with nature. Benjamin considers the acquisition of language responsible for shifting our experiences, into an intervening realm of word worlds that are codified in abstract representations of "non-sensuous similarities" (Mowbray, 2009). Thus, our relationships with objects and with each other became increasingly non-sensual as language took over. On this, Benjamin speculates that language has diluted our mimetic faculty where "earlier perceptive capabilities for recognizing the similar" were previously more developed (1933/1979: 68). Abram echoes this view when he says: "[…] it is only when a people learns to read these written letters that the land begins to fall silent. Only as our senses transfer their animating magic to the written word do the trees become mute, the other animals fall dumb" (2017: 9).

However, an anthropology of sound presents us with an entirely different consideration of how the mimetic faculty can sensuously work in conjunction with language. The natural landscape participates in generating sounds and structuring the auditory information that reaches the ear. Furthermore, Gell insists that forest environments in particular "imposes a reorganization of sensibility […] which gives pride of place to the auditory sense" (Gell, 1995: 232).[124] In "Voices of the Forest" Steven Feld explores how the 'environmental features of vegetation and sound link to the movements of its past and present inhabitants' (1994: 7). Feld's research contrasts with Basso, in that the former is interested in the resonant

[124] Gell's critique is based on what he calls "methodological deafness" (similar to what Boas referred to as "sound blindness") Gell's experience in the dense rainforest where visibility was reduced, led him to believe that people who are raised in forest environments rely more on the auditory sense.

properties of sound that bring about patterns of memory, as opposed to the latter whose interest is in 'places that remind'. While conducting fieldwork among the Kaluli in the rainforests of Papua New Guinea, Feld observed the songs of the Muni bird on Mount Bosavi that descend in notes D-C-A-G become integrated into the half-wept, half-sung words of the weeping ceremony; a poetic ritual practice called "bird sound words" (1982: 32). In this conception of the mimetic faculty for language it is not at all based in abstract non-sensuous similarity learnt as a child from our mother's tongue, as Benjamin would have us believe. Feld proposes that sound isn't just another way of knowing, it is the very medium of thought through which knowledge percolates to the surface and gets expressed. He finds a "constant interplay of inspiration, imitation, and incorporation that linked the flow of natural and human sound expression" (2007: 3).[125] This phonological relation between natural sounds and articulatory acoustic expression, is doubly reciprocal in reinforcing mnemonic sense of place, because every spoken word refers back to the sounds in nature from which its meaning is derived (Feld, 2005).

Bird songs are not the only thematic sounds of importance for the Kaluli. The acoustic sensation of waterfalls and rivers that flow through local lands encodes meaning that brings listeners on a place-naming journey that connects emotionally and physically to memory. "[T]he inseparability of rainforest waters and lands is encountered and imagined to be like the flow of voice through the body's contours. […] these flowing paths reveal a Kaluli acoustemology of place relations, a fusion of space and time that joins lives and events as embodied memories" (Feld, 1996: 91). Gell's (1995) research with the Umeda (also in Papua New Guinea rainforest) arrives at strikingly similar conclusions. In "Language of the Forest" his main thesis is that people who live in dense forests have developed language that is rich in phonological iconisms. Speech sounds and semantic meanings have relationships that can be mapped on to the ecology of natural sounds in the forest environment (1995: 234). As

[125] A point that I shall come back to later, but based on Feld's research, I see no obvious reason to divide the sounds of canoe building up into categories of natural vs. vocalised acoustics. I think it's more prudent to treat all sounds, including reflexive voice and narrative as sounds that arise from the embodied experience in our material environment. The moment we begin to treat language as separate from nature and purely abstract, then we fall back into the trappings of classical cognitivism with representational theories of mind.

Gell summarises, in Kaluli poetics, "place, sound and social memory are fused together" (Gell, 1995: 249).

Western linguistic theories suffer from the limitations of Saussurean models of semiotics that conform to the idea of a fairly complete arbitrariness of spoken signs. Gell points out that in English there are "no obvious relationships between 'natural' sounds and speech sounds" except in the rather rudimentary form of onomatopoeias (like splat, crunch, and pop) (1995: 232).[126] This, according to Gell, leads to a "methodological deafness," which is the marginalisation and general lack of interest in the auditory domain in anthropological research (1995: 246). This failure to register how the sensory modality of environmental listening participates in the utterances of everyday life, also results more broadly in a failure to recognize how a particular cultural orientation to knowing about the world by the way an attunement to natural sounds can become the principle underwriter of embodied memory.

Let us return for a moment to where this chapter began with Bateson's 'ecology of mind' with "patterns that connect" nature and culture (1973: 225). To this we can add Gibson's (1977) influential concept of direct perception and material affordances to consider how the very structure of the environment shapes the range of ecological activities that are available to us. Conventional cognitivist theories of mind that inform our understanding about procedural skills memory lean heavily on the assumptions of representational models, which continue to uphold a Cartesian division of mind over matter. Working within a material engagement framework is better suited for understanding the dynamic processes of humans involved in everyday sorts of activity, because, as Malafouris says: 'we can do away with the erroneous prejudice that the mind has executive control over the body, and that materials are presumed to be ontologically insignificant for cognition.' (2013: 233). In this non-dualist framework, the trees can indeed take on the agentive role of teacher. Casting serious doubt on

[126] And a lesser known category of "expressive" with words ending in -sh, which signifies a destructive action but also carries some of the sound as in slash, crash, and bash.

representational theories of mind, the competing claim posits that the vast majority of tasks that involve procedural memory are performed without any introspection, simulation or pre-reflection at all (Schacter & Tulving, 1994; Hutto & Myin, 2017; Sutton & Williamson, 2014). An understanding of the way the body remembers and performs its practical skills, when working within a MET framework, then is largely pre-reflexive, immediate and based on direct sensory perception from our surroundings. It involves the ability to act on our perceptual awareness unconsciously through proprioception – (that is an automatic ability to be in control of one's own body, but also to do so with a spatial awareness in relation to other bodies and objects).

What's important here is that sound has the profound power to engage procedural skills memory according to its interactional properties with materials. Treating natural sounds as phonological iconisms for language overlooks what the sounds of materials actually *do* for our procedural memories of embodied routines on a pre-reflexive unconscious level. My study responds to this by searching for evidence of an acoustic epistemology that manifests in bodily movement and material form, rather than just articulated speech.

In "Mimesis and Alterity," Taussig takes a slightly different approach. He offers a compromise that skirts around the debates about our mimetic capacity for articulatory language. Taussig, like Benjamin, believes humans have a 'pre-linguistic' capacity for sensuous similarity, but he is not convinced that the abstract representational character of language has caused our mimetic powers to decline. Based on fieldwork with the Cuna, Taussig claims the mimetic faculty can (still) radically displace the self (1993: 39) and he notices that their mimetic worlds are anchored in their invisible counterparts of dreams and visions (1993: 75-81). As such, he realises that it doesn't really matter whether the articulated sound signs for language or icons and symbols are abstract or not, because our mimetic faculty is able to work through abstract signs on a sensuous level almost automatically as 'second nature' to discern resemblances and correspondences (Mowbray, 2009).

The mimetic archive connects us with long-forgotten correspondences through a relationship with nature that is based on *affinity*, rather than mere sameness, imitation, or duplication (Hansen, 2011: 148). This affinity transcends non-human entities who broadcast their own sonic and iconic forms to become incorporated into the embodied skills and practices of humans. This is not the will of human agents emerging triumphantly over material constraints; but rather the realisation of material and ideational forms through skilled actualization in the physical world.

Our activity within the soundscape constantly washes and bathes our bodies in acoustic vibrations. Every situation has a rhythm, every action produces sound. It is through a transformed practice of attention by listening to the sensuous properties of matter that nature offers the resonances of the mimetic archive to our senses. Learning to listen to the sensuous qualities of trees is a skill that is honed, by training our ear to recognize phonological similarities and differences. It involves a re-attunement that is achieved by transcendence through a process of self-emptying or kenosis. We have to un-learn what we think we already know and learn to trust our senses as they are guided by the materials. According to Mazzarella, sensuous similarity is "what comes alive when the subject yields to the primacy of the object […] other historical potentialities start pressing on the present, other resonances become available for actualizations" (2017: 146). What is important to highlight here, as Hoekstra explains: "is that mimesis yields to nature, adapting to it, like a chameleon, rather than trying to dominate it- the process absorbs ideas rather than imposes ideas. As such, imitation often implies a kind of humility, a recognition that some qualities outside oneself are worth acquiring" (2017: 30).

4.32 Harvesting Cedar: Putting mimetic resonance into action

Heading into the bush in Lanark County one fall morning, Chuck steers his bright new white Chevy 1500 pickup truck off the road, over a culvert and onto an overgrown path that looks

like it could have been an old woodlot tow line. The tall brush pings off the undercarriage and twigs scratch like fingernails along the paint as he gently maneuvers around some rocks and over some windfallen branches that lay in the way. Before long, he cuts the engine, his eyes focused ahead at a jagged granite slab protruding to block the trail. “Don’t want to get hung up on that,” he says. The forest is quiet in contrast to the rumble of a Cummins diesel engine. As the exhaust fumes settle, Chuck lowers the tailgate, grabs a chainsaw from the flatbed and hands me an ax and some wooden wedge. We set off on foot to harvest some cedar.

The path continues along a ridge. On one side there’s a plateau of softly rolling hills packed with young silver maple and birch. The other side overlooks a steep slope into an expansive gully sparsely filled with majestic hardwoods: ash, oak, hickory, ironwood and maple. The deciduous trees have begun to shed their leaves and their crispiness under foot makes walking a little louder but also more playful as we purposely drag our feet like children and shuffle along. Chuck points to a tree off in the distance and says, “the ash-borer [beetle] has gotten nearly every one of these now.” Nobody likes dealing with a monopoliser. These beetles make it challenging to find suitable ash for the cross beams of the canoe. Chuck is keenly aware of this new contender that leaves the wood tunneled out, digested with holes full of sawdust. He explains that this tree is sick and that normally a healthy ash tree would still have half its leaves this time of year.

Before long we spot the distinctive dark green form of the cedars beginning to bleed into the margins of the deciduous forest. As we approach four mature cedars growing together in a cluster, Chuck pulls a little pouch from the inner pocket of his fleece jacket and takes a moment to offer some tobacco to give thanks to the cedar for honouring us with its fine wood and to the creator for keeping us safe from harm. This is not a hastily made exchange. It is an intimate encounter between local inhabitants that brings the coexisting memories of humans and trees into each other’s circle of sensory attention. The cedar roots know the lay of the land as they contour the rocky shield to sip water from its soil and make contact with their

fellow neighbours. This particular cluster of 4 cedars is sprouting multiple stems from the same stock; cooperatively growing together but leaving the inner sides of their trunks free of branches to give room for each other to breathe. These trees are natural record keepers of the forest, documenting large events like the fire that passed through in 1952 and the great ice storm of 1998, but also everyday events beyond humanly concerns and on timescales we may yet understand. Through their own peculiar daily habits these trees also participate in mimesis. They may register memory differently but imbedded in the core of their constitution is an individual mimetic character that is a reflection of their similarities entangled in the ecology and topography of these grounds.

Chuck's movements synchronize with the cedar. He is circling round the tree and by looking up at the visible striation in the bark he can tell which way the predominant winds blow and whether the grain of the wood will spiral or twist inside. He knocks on the trunk with the butt of his ax to listen if the heartwood sounds hollow or rotten inside. Sound draws our attention inside the materials to reveal things about the wood that cannot be discerned with the naked eye. Vision, (unless we enter the realm of dreams) after all, stops at the outer surface. Once his curiosity can no longer be contained, the chainsaw intervenes with mechanical efficacy much like the pickup truck; very loud, smelly and conspicuous. But after a brief minute the scream of the two-stroke engine is replaced by the quiet sounds of activity that return once the cedar is felled to the ground. Chuck makes quick work of the backside of the ax using it as a sledge to hammer the wooden wedges into the log. Each blow yields a distinct percussive auditory signal issued like notes climbing higher in register as the wedges are driven deeper and tighter into the wood. When the wood begins to split the pressure on the wedges lessens and accordingly the ear is able to discern this by the drop in sound. The first splits are from the outer circumference towards the center heartwood to section it in half and then again in quarters and eighths. Listening to these percussive signals that give way to creaks and cracks as the splits travel in the cedar teaches us to recognize difference for example, when the wedge is impeded by encountering an imbedded branch knot or when the cedar splits off course. The physical properties of the materials implore our ears to stay alert as the sounds carry information about matters that cannot be seen.

Schafer (1972) refers to sounds that are characteristic elements of the environment as the *keynote*. These are sounds that dwell in places and are created by its geography and climate and natural elements such as water, wind, insects, birds and animals (Schafer, 1993: 10). A *"signal"* on the other hand is a sound that is listened to consciously. It's tempting to think of the *keynote* as background noise and the *signal* as sounds that occupy the foreground, which speaks to the way sounds are layered and occupy spaces differently by their intensity, amplitude, volume, and frequency. But humans rarely understand sound on the direct basis of these metrics and quantifiable physics. The emphasis between the *keynote* and the *signal* is as much to do with the technical properties of sound as it is with our own perception and phenomenological experience shaped by habits, beliefs and knowledge that we call culture (Feld, 1994). The human mind and auditory system are remarkably adept at isolating particular sounds to draw them into our circle of attention in the foreground and then cut them loose again allowing the sounds to recede. Working in the forest requires the constant shifting of our attention between keynote and signal sounds to stay alert. The success of our efforts splitting cedar depend on it, but so too does our safety for maintaining a general awareness of animals and weather in our surroundings.

Fig. 20. Chuck and Grant wedging cedar

Most of the frame for the Algonquin canoe is made up of longitudinally split cedar; Long lengths are for gunwales and stems; and short lengths are for ribs and the inner sheathing that protect the inside of the bark. The splitting of the cedar is facilitated by the selection and high-grading of the materials, which certain individual trees afford more than others due to their fine, evenly structured grain. Splitting along the grain allows entire trees to be reduced into slim members for the canoe frame without requiring complicated tools or an excessive expenditure of energy that would be involved in chopping or milling. It is, after all, much quicker to split.

In the next stage of refinement in the preparation of materials for a canoe, the acoustic signals leave behind the rough splitting of tree trunks with wedges and the dull percussive blows made by hammering and sledging and moves into a more delicate creaking and cracking that is produced when tearing and chasing a single grain or growth ring along its length. This occupies a middle rung in the sound score, which in turn will give way to the soft rhythmic sounds of trimming and peeling when it comes time for the final stage of refinement of the frame members when whittling and carving them with crooked knife.

The Algonquin method for refining and splitting the long gunwales is to place a piece of rough wedge-split cedar in between the crook of a couple of trees and to split down the center by biasing the pressure applied on one side or the other to steer it on track. (fig. x) Chuck says: "you can hear when it starts to jump grains and runs off because the fibers crack rather than tear"[127] This kind of splitting necessitates listening to the delicate nuances of the controlled creaking and cracking that can be heard when chasing a single grain. He listens for signals

[127] The difference in sound is subtle, to my ears it sounds like peeling masking tape when things are going well. And when it is running off it sounds like something cracked and snapped. When you successfully steer the split down one grain in the wood the sound is of sheering tearing fibres, if you go off you will hear it break through growth rings and jump grains and snap.

that are indicative of the split running ahead too fast or running off. The pressure he applies with his hands is moderated by the noise feedback of the steady tearing and parsing of the fibers that the cedar is giving back to him. The difference in sound is subtle, but he gently applies pressure to *push the sound* forward slowly.

Fig. 21. Bisecting gunwales through sound

Chuck positions his body within the 'Y' of the parsing wood like a giant sounding rod listening to the resonance qualities of the fibres at the apex of the action. Sound travels resounding within the materials ahead of the leading edge of the split. Chuck listens carefully as his attention is drawn into the cedar. This communicates to him what is going on inside the materials. The formal durational properties of the materials help to structure the tune of the sound that reaches his ear. This sonic signal mediates the procedural memory to instruct Chuck through the motions of this skill and act as real-time guidance system and diagnostic tool. The sound emerges from our relationship with the wood; it is neither located in the materials nor in the environment, but rather is an inherent property produced directly by his material engagements. The controlled splitting

of fibres communicates information well in advance of the first visual cues and alerts Chuck to an imminent problem so he may initiate an appropriate response before it is too late.

In birch bark canoe building its maker and its materials are involved in a kinesiological exchange that transcends the here and now. The mimetic archive releases sensuous similarities that have been sensed between bodies and trees since time immemorable. The tree and the flesh are absorbed into a peculiar interchange where they are pushing each other to the brink of their mutual capabilities. An anthropology of sound indicates that there are ecoacoustical dimensions of the harvest that cut across multiple historical and epistemological paths in an enduring process of mimetic entanglements.

4.4 Conclusion

In this chapter I explore the aural dimensions of natural materials as mnemonic mechanism for the transmission of Indigenous cultural knowledge. I challenge social memory models that rely on narrative practice by demonstrating the phenomenological complexities of aural pattern perception as a generative ontology of mnemonic flow between bodies, minds and materials. Through an archaeological and ethnohistorical investigation of petroglyph sites I illustrate the many layers of epistemological integration of natural sounds into Algonquin culture and lifeways. At the Mazinaw Lake and Kinoomaagewaapkong (the rocks that teach) sites, for example, natural sounds are fully canvased to provide inspiration and meaning for stories, events and embodied memories.

At the Elder's urging to 'listen to the wood' while apprenticing to build traditional Algonquin canoes, I experienced ecoacoustical ways of knowing where trees have an agentive capacity to teach. Together with the concept of mimesis, this ethnographic inquiry provides an intervention in classical cognitivism and in continental philosophy that urges us to reconsider how the senses can communicate with long-lost correspondences deeply

sedimented in nature. In this conception, materials are conceived as bundles of "sensuous properties of matter," which carry forth the memory since their time of origin just as sensory perception also carries the memory of everything we have come to know through all previous sensory experiences (Hamilakis, 2013: 21).

Through sensory ethnography with Chuck as he splits roots, searches for birch bark, and harvests cedar wood, I learned that it is possible to train the ear to listen to trees as they communicate many of the core procedural skills necessary for building an Algonquin canoe. This knowledge is absorbed (not imposed) into cognitive becoming through sensuous similarity with the materials. The formal physical properties of wood, which serve to structure the audible signal that reaches the ear, manifest as an enduring interface with the senses, where nature continues to offer up these similarities over time. As canoe builders engage with cedar, listening to the wood becomes a means by which procedural memories become *active.* This does not merely treat materials as external repositories for memory in the archival sense. Rather the knowledge of the canoe presents itself as an emergent property of the sounds emitted between bodies and materials. But sound by its very nature dissipates once the source of its activity stops. If we don't take the time to learn how to listen to the material relations between trees and humans, whole bodies of cultural knowledge are at risk of receding into quiet dormancy.

Chapter 5

Material Inheritances and the re-active memory of the crooked knife

5.1 Introduction

If we are to take seriously the notion of mind as being extended beyond the confines of the brain and body, then the investigation of procedural skills memory must also consider how the environing world participates in bodily ways of knowing. This chapter examines how the material world -itself integral in the extended mind's neuro-artefactual network- actively participates in mnemonic processes. The underlying principle being that external resources are not just inert, mindless matter used by humans to offload and transmit cultural memories, rather they are synergetic participants constituting cognition in an inseparable physical and mental realm.

Using sensory apprenticeship as research method I, along with other novice participants, build birch bark canoes with Chuck Commanda, an Algonquin canoe builder from Kitigan Zibi.[128] Together we explore the role of tool-use and the somatic interactions with birch, cedar and spruce have for the processual continuity of memories. In this chapter I focus on the theoretical dimensions of how the artefactual world, itself a key component in the extended mind's theatre of memory, conscripts people into re-enacting patterns of immersive habits and behaviours in the acquisition of new and continuation of old skills.

In the first section I provide a brief review of the problems with the archival models of memory. and The literature on the extended mind hypothesis, continues to uphold a conventional storage model of memory in classical cognitivism. In this antiquated model, memories are said to be

[128] The fieldwork I draw on for this chapter is from the construction of two birch bark canoes. The first took place from June 3rd – June 21nd 2019 indoors in the central pavilion at Sacred Heart Secondary School. The second canoe was built outdoors from July 8th – July 17th, 2019 at Murphy's Point Provincial Park in Ontario, Canada.

embedded as exograms in material culture or embodied as engrams in the central nervous system. I utilize a Material Engagement approach to shore up these conceptual shortcomings to reveal the ways in which memories are never really parked or stored anywhere but are rather continuously driven by our real-time material engagements flowing from our ecological activity.

In the next section I bring a new intervention in cognitive philosophy by exploring the convergent philosophies of Bergson's "*pure memory"* and the Indigenous concept of "*blood memory."* Central to the ontology of remembering among First Nations people in Canada is the belief that knowledge flows from the land to connect modern-day descendants with the wisdoms of their ancestors (Betasamosake Simpson, 2014; Coulthard & Betasamosake Simpson, 2016). However, the manner in which ancestral inheritances take shape through the interplay of bodily sensation and topographies remains poorly understood and insufficiently theorized in the research guiding archaeological studies on landscapes, cognition and memory. Blood memory articulates how transformative spiritual powers can interact with histories and geographies on multiple levels to offer Indigenous people an inheritance of lifeways, culture, and art (Allen, 1999; Huang 2006; Henderson & Wakenham 2009, Ormiston, 2010). *Blood Memory* and Bergson are both helpful concepts that explains how relationships with the natural world can be restored and how cultural practices can be revived through the practice of conscientious sensual attunement.

To illustrate how storage metaphors of memory are ill-suited to explain what Indigenous people have known about landscapes and ancestral memory for millennia; I draw upon an ethnographic case-study of crooked-knife use in the hands of a novice canoe builder as they learn to carve cedar ribs for the first time. Part of the problem is with the tendency to view the tool (or the crooked-knife in this case) as somehow possessing an essential embeddedness of memory or the ancestral know-how of crooked knife use. I will take an opportunity to clarify MET's position and show how a Material Engagement approach responds to the problem of an essential embeddeness of sensory memory in material culture. MET's position on the role of tactile senses

in tool use is not developed with an essential embeddedness of stored memories, but rather centers around an enactive stance where materials participate in shaping the texture our perception and the memories that flow from these experiences. In effect, memories are never pre-formed in so much as they are performed. As Malafouris reminds us: “the sensual properties of things and the aesthetic experience of things permeate every aspect of our cognitive activities […]” (2013: 87). Afterall, the sensory dimensions of objects and materials, both from the subjective phenomenological perception of touch as well as from the formal durational properties and material affordances, give texture and meaning to our bodily actions and skilled performances. We can also look to Van Dyke who offers: “Materials invoke references and relationships not only through formal similarities but also through practices, shared experiences, and emotional and sensory associations” (2019: 215).

In my analysis I borrowing from Stiegler’s notion of the “exteriorisation of memory” (1998) and Dreyfus’ (2004) stages of expertise, I challenge normative ontological models of memory-as-archive and refute these misguided notions about how ancestral memories are supposedly embedded ‘out there’ on the land or how memory traces are embodied ‘inside’ our blood or the central nervous system. Casting serious doubt on the validity of such storage and retrieval metaphors, my long-term fieldwork studying Indigenous canoe building in Canada has enabled me to observe and experience the ways that memory is haptically explored and inextricably entangled with the everyday tools we use to engage in our material environment. In using MET and in-line with an Algonquin ontology of blood memory and Bergson’s *pure memory*, I offer a much more plausible solution: That ancestral memory is imminent, temporally persistent, actively participating and ready-at-hand to be enacted through our material engagements in our skillful dealings with the world (Bergson, 1896/2004 Casey, xix; Lowenthal, 1985; Malafouris, 2013, 2019a; 2019b, 2020).

5.2 A Brief Summary of the Archival Model

The storage or archival model of memory can be traced at least as far back as Plato's metaphor of memory in *Theaetetus* where he likens it to an imprint on a wax tablet (1961: 897). Then through to St Augustine who saw it as a kind of storehouse and compares "memory's huge cavern, with its mysterious secret, and indescribable nooks and crannies." (*Conf.*, 11.8). Inventions in science and technology enabled the vocabulary of memory studies to evolve. In Descartes's time understandings about the workings of the mind were informed in part from the findings of autopsies. He thought memory flowed through cerebral fluids or animal spirits that "trace figures in these gaps, which correspond to those of the objects" (1662 / 1972: 87). Nowadays magnetic resonance imaging (MRI) helps us colour our language about memory as the bio-electrical activity of neural networks and synapses. For classical cognitivists, the computer proved an irresistible analogy to think about the human mind (Lyons, 2001: 151; March & Glavneau, 2019: 2-3). Von Neumann's (1958), famous account, for example, proposed that "the nervous system has a *prima facie* digital character" (97). Developed in parallel with the disciplines of cognitive science and neuroscience, the sophisticated design architecture of the computer provided a compelling new metaphor that regretfully obscured our understanding of memory further by reducing it to the traffic of data along tiny conduits of silicone semiconductors. These metaphors also served to re-enforce the notions of a supposedly mysterious inner workings of the brain. Consequently, much of the research on memory began from the premiss that not only is there such a thing as the inner workings of mind, (which MET does not entirely deny) but also that human memory, consists of three core processes: Encoding, storing and retrieving information (e.g. Gross, 2005: 244; Sumrall et al., 2016: 25). This computational model of mind not only applied to declarative forms of episodic, autobiographical and semantic remembering, but also to procedural memory where "working memory" of the body is the collection of internal sensorimotor repertoires summoned by a 'need-to-act' (e.g. Baddeley, 1986, 1997; de Beaune, 2009). As Danzinger points out the "root metaphor" of memory is still very much the storage platform where information is inscribed on a physiological substrate and then later retrieved (2008: 24).

While the neurocentric and computational approach, was critiqued for being monolithic and too internalist, a new wave of 4E cognitive theorists sought to remedy some of the major theoretical shortcomings that occur when treating the brain as the body's central processor. However, despite early warnings from cognitive psychologists like Kolers & Roediger that "there is little reason to think the computer's electronic circuitry provides a hardware model of the brain and no more reason to assume that its software models the mind" (1984: 426), most studies on memory (and ironically including their own) remained narrowly concerned with the metrics of retention and retrieval practices. 4E cognitive sciences attempts to move beyond internalist brain-bound theories of mind by developing radical new ways of thinking about memory. And yet in spite of these efforts (or maybe because of them) the memory storage paradigm remains just as deeply entrenched.

5.3 The Extended Mind and External Memory

Extended mind theorists were keen to note that humans devise clever ways to use objects to extend memory. Clark & Chalmers' (1998) *parity principle* proposed that the use of a notepad for Otto, an Alzheimer patient, could be considered as functionally equivalent to his biological memory where it "just happens that this information lies beyond the skin" (1998: 13). Their research necessarily recognized that the conventional boundaries of the brain were problematic. Yet, while objects can be used as an antidote to the leaky problem of forgetting, construed in this way as substitutes, stand-ins or epiphenomenal proxies that functioned in parallel support of human memory; things were merely elevated from objects of external stimulus to objects of causal influence capable of triggering a mnemonic response (Malafouris, 2013; 10). Furthermore, external memory "help individuals to recover whatever contents their native biological memories are already assumed to have" and in this capacity were taken to be at best instrumental and at worst iterative. (Hutto & Peeters, 2018: 100). In this limited conception proponents of the

extended mind hypothesis simply handed the internalist storage model in classical cognitivism off onto the outside world without doing much to address its deficiencies prompting some, like Loader, to call this an "easy move" (2013: 177) and others, like Skorburg, to say this was the conceptual equivalent of reaching for "low hanging fruit" (2017: 473). Indeed, imprinting, storing and retrieving technologies such as, clay tablets, pencil and paper, or computer hard drive provided an increasingly efficient external exographic information storage system, however, the observation that humans deployed such strategies did little to challenge the entrenched assumption that human biological memory might not function at all in the same way (Burton, 2008: 322; Sutton, 1998, 2008: 45, 2009b; Renfrew, 2004; 29). Simply put, the externalization of cognition cannot remedy the trappings of the interiority of mind.

A second wave of extended mind theorists acknowledged what the *parity principle* didn't: That the memory entrusted to external technologies is inherently different than biological memory. Dartnall alludes to this when he says: "the active nature of real memory" (quoted in Clark 2010b: 52). Here, attention was called to the ways human memory is dynamic, fluid, forgetful, and almost always a construction that is context dependent. Complicating matters further, some special categories of objects were also said to be highly 'active' possessing *epistemic agency,* endowing them with the apparent capability to *actively* shape and participate in our mnemonic behaviours and skilled performances. Latour's Actor-Network Theory (ANT) provides a classic example of the weighted hotel keychain, whose cumbersome physical qualities conscript hotel guests into an action program that make people much more likely to turn their room keys in at the front desk before leaving the hotel (1991: 104). Other examples of epistemic agency also include the way a GPS guides a motorist along a particular path; even providing optimized routes in real-time. Yet, epistemic objects raised fresh rounds of debate about what counts as real external contributions capable of doing the cognitive work of a truly extended mind or what is merely an external resource re-assigning pre-programmed content or procedural memory script back onto the human cognizer. Even still considering the highly agentive notions of external memory devices did very little to upend the archival model of memory. As Loader (2013) aptly

says: “instead of ‘static storage’ we have ‘active storage’” steering safely clear of the idea that “memory might not be a store at all” (172).

If the extended mind hypothesis did not make as big of an impact as it perhaps ought to have it’s because similar ideas had already been brewing under related theoretical developments of technological prostheses (e.g. Leroi-Gourhan, 1993; Stiegler, 1998), ecological niche-construction (e.g. Sterelny, 2010), and with an environmentally and socially scaffolded mind (e.g. Basso, 1996; Tribble, 2005). The highly specialized class of portable and transferable memory objects (i.e. those that enable encoding, storing and retrieving of informational content) exemplified by Clark and Chalmers in the hypothesis of the extended mind represents only a small subset of the greater phenomena whereby memory is mutually engaged with the rest of our environment’s made and natural resources at large. Of course, what remains enticing about the extended mind hypothesis is the possibility that human memory may not only be offloaded and augmented by mere technological advancement but that the mind may also be extended beyond the body through intrapsychic experience with material legacy. However, without a Material Engagement approach, to move us beyond the trappings of the storage model, the extended mind’s hypothesis in and of itself leaves a lot to be desired.

5.4 Blood Memory: An Indigenous Ontology

First proposed (in print) by Indigenous novelist Navarre Scott Momaday in *House made of Dawn* (1968) and later developed, by First Nations authors, James Welch in *Winter in the Blood* (1974), and Gerald Vizenor in *The Heirs of Columbus* (1991). In First Nations literature, Momaday’s (1968) juxtaposition of blood with memory was initially articulated as a means of seizing control of the colonial government’s blood quantum standards, which determined the degree of tribal affiliation for Indigenous people of mixed heritage. Momaday wanted to transform a fractionalizing foreign measure of Indigeneity broadly used to discriminate and limit people’s

access to government services by redefining what it meant for Indigenous people to recognize their ancestral heritage by exercising their own body's remarkable capacity for memory. As Allen explains, Indigenous authors "call upon the imaginative power of blood memory to defy attempts by legislators and others to quantify contemporary indigenous identities for their own ends, to inscribe indigenous identities as a number always *less than* that of the generations that came safely before, as a number moving inevitably towards zero" (1999: 111).

In an interview with Charles Woodward, a professor at South Dakota State University, Momaday says: "I think each of us bears in his genes or in his blood *or wherever* a recollection of the past. Even the very distant past" […] "There are times, when I think about people walking on ice with dogs pulling travois, and I don't know whether it's something that I'm imagining or something that I remember. But it comes down to the same thing" (1987: 22).[129] However, as Allen explains: "It is precisely this blurring distinct categories of mental experience that offends the critical sensibilities of western readers" (1999: 106). Momaday's characterization of memory as having many similarities with imagination finds good company among a handful of other memory theorists (e.g. Tulving (2002); Hutto & Myin (2017: 217). Michealian says: "to remember, it turns out, is just to imagine the past" (2016: 14). In this regard, memory is also compared to a kind of mental time travel, (Suddendorf & Corballis, 2007; Tulving, 2002) that "extends our cognitive contact with the world beyond the here and now of perception" (Hutto & Myin, 2017: 222).

It is worth comparing for a moment that Bergson's theories on memory are also replete with the blending of distinct mental categories, whether it be durational time as qualitative multiplicity – where "several conscious states are organized into a whole, permeate one another, [and] gradually gain a richer content" (*Time and Free Will*: 122); or the imbrication of *Matter and Memory* that "affirms both the reality of matter and the reality of spirit" (*Matter and Memory*: 9). With *pure perception*, Bergson asserts, if only we were more aware of how our own

[129] Momaday Quoted in Allen 1999: 105-106.

consciousness, imagination, and perception works against us as filters limiting mnemonic recovery, humans might otherwise have the potential to train their perceptual faculties for greater purposes. As Van Dyke points out, for Bergson 'past matters and perceptions heavily intrude onto the present' (2019: 209). To Bergson, all memory, indeed every memory that ever occurred, is omnipresent (1896/2004). (Walter Benjamin's project of the *mimetic archive* is of a similar vein). Though Bergson's philosophy of mind comes from entirely different ontological trajectories than the Indigenous intellectual framing of *blood memory*, these two distinct threads share some remarkable similarities. Perhaps out of a desire to explain aspects of human memory that remain little understood, his theories are endowed with complementary convictions to Indigenous concepts of *blood memory*.[130] I shall return to revisit the philosophy of Bergson in *Matter and Memory*, in a moment, especially for his concept of *pure memory,* which treats human memory as processual continuity. For now, suffice to say that the popularity of Bergson's theories within continental circles, including his metaphysical leanings and spiritualist affiliations have never really offended the critical sensibilities of western readers.

Arnold Krupat a professor of literature, criticizes Momaday with an almost stunning level of resolve. Seizing upon the genetic aspects of Momaday's claims. He says: "There is no gene for perception, no such thing as memory in the blood" (1989: 13). In his opinion, 'writing about inherited forms of genetic memory serves only to further mystify the condition of Indigenous perception' (14). Krupat's arguments spill over to provide a storyline in Vizenor's (1991) novel *The Heirs of Columbus*. Using "trickster discourse", an Indigenous narrative technique, to work beyond the usual of partisanship of scholarly debate, Vizenor injects ridicule and humour to offer new interpretations that take us beyond the impasse of polemic disagreement. Leaving no one unscathed, his satire pushes Momaday's notion of genetic memory to absurdly rational conclusions. The notion of memory in the blood is comedically explored with the establishment of a genetic research center, searching for "the genetic signature of survivance" and Krupat, a

[130] Nowadays, Bergson's theory on memory have been diluted and purged of most of his metaphysical leanings to suit the evolving intellectual trends over the latter half of the 20th century (see: Guerelac, 2006: 179-180).

non-Indigenous career literary critic of Native American literature, is portrayed as obtusely academic, having put western inquiry to inappropriate use mixing blood logic with the disparate project of Indigenous recovery and self-determination (Allen, 1999: 110).

Yet the scientific community's obsession with the lingering question of finding proof of a genetic component to *blood memory* remains.[131] In 2018, Dr. Janet Smiley a Metis-Cree family physician and public health researcher was called as an expert witness to testify on Indigenous Peoples' Resilience at the National Inquiry into Missing and Murdered Indigenous Women and Girls (NIMMIWG) in Canada. Dr. Smiley was asked if 'she could help the commission understand more about the science of epigenetics and Indigenous perspective on '*blood memory''* (NIMMIWG, 2018: 102). In her testimony she explains that the fascination with epigenetics – as a longitudinal marker of generational trauma with potential public health outcomes- is a foreign initiative of medical research that does not necessarily reflect or respect the priorities of Indigenous communities. Dr. Smiley recounts: "Elders [were] coming up to me saying […] I don't want you to study our DNA and say how damaged it is; I want to follow the priority in this community, which is, like let's talk about trauma and sexual abuse and figure out how to stop it" (NIMMIWG, 2018: 105). Dr. Smiley tells the commission that a conversation between Elder Leroy Little Bear from the United States may have sparked some initial excitement around epigenetics because there are some analogies between the Elder's wisdom of "original instructions" and genomic research of DNA. From our perspective, she elaborates, "even if it isn't in our memory or we don't hear a story that triggers it in our memory, it's all there, we know, we have our [original] instructions"

[131] The scientific community has a fascination with transgenerational memory inherited from DNA. For example, the "Soul Catcher" project (Guardian, 18 July 1996) fed RNA or so-called "informational macromolecules" from donor rats to see if the recipients would repeat the donor's experiences (Rose, 1993: 189-99 -cited in Sutton, 1998). More recent research in epigenetics investigates 'transgenerational inheritance of stress-induced traits' where the offspring of mice exhibit the same epigenetic markers and PTSD behaviours as their trauma induced parents (Gapp, K. et. al. 2014). In one experiment mice were trained to fear the smell of cherries and almonds by being given a small electric shock. Researchers found that the genetic offspring raised apart from their parents exhibited similar fear and body shudders in the presence of the acetophenone smell without ever having been exposed themselves to electrical shock conditioning. What's even more remarkable is that this fear was visible for up to three generations. ("Fearful Memories Passed Down to Mouse Descendants" Scientific American: Dec 1, 2013).

(NIMMIWG, 2018: 103).[132] Indeed, the appeal of *blood memory* with its notions of original instructions is that it provides a mechanism to believe that the loss of identity, language, connection to clan, to family and to community, as well as to ceremonies and customs, may be reclaimed through survivance strategies of transgenerational remembrance and genealogies of imaginative recollection.

In *Stories from the Body: Blood Memory and Organic Texts* (2011) performance artist Monica Mojica (Kuna & Rappahannock) explains: "Our bodies are our libraries -fully referenced in memory, and endless resource, a giant database of stories. Some we lived, some were passed on, some dreamt, some forgotten, some we are unaware of, dormant, awaiting the key that will release them" (2011: 97). Though Indigenous scholars themselves sometimes employ storage metaphors the key difference is that they do so only thematically to try and articulate the meaning of *blood memory* in terms that are familiar to western audiences. At times Mojica, like Momaday, seems to also appeal to the to a genetic source of memory. For example, when she says: "I am talking about the stories I carry because they have been passed on through my blood, encoded in my DNA" (2011: 97). Though she quickly follows up: "Of course I can't and won't attempt to offer any 'scientific proof of this" (*ibid*.) When DNA is elicited in *blood memory* it is done so as a powerful metaphor to appeal to western audiences. As Weaver offers, DNA is an "evocative synonym for culture" (2001: 7). Or as Huang says, a kind of 'cultural coding beyond conscious remembering, so "deeply engrained and psychologically imbedded" as to be spoken metaphorically as a part of the genetic body and in the blood' (2006: 188). Yet at other times Mojica seems to appeal to more conventional storage metaphors of memory when she says: "our bodies are our libraries" (*ibid.)* and "the land is our archive" (2012: 219) However, here too she

[132] Similar phenomenon to *original instructions* being "all there" are observed outside of Indigenous claims, including some rather mysterious and inexplicable cases of "total recall." The most striking examples are of acquired and sudden savant: Leslie Lemke, a musical virtuoso, or Zerah Colburn, a mathematical prodigy, have baffled psychologists to explain how they could possibly have accessed such complex syntax, and language in music and math that neither had ever formally learned. Other testimonials occur post-traumatic brain injury, where the brain appears capable of accessing innate or dormant knowledge by a "reorganization of cognitive/semantic and procedural/habit memory circuits" (source: "Genetic Memory: How we know things we never learned" Scientific American: January 28, 2015).

is using these terms to for the benefit and understanding of western audiences; an appeal she makes with the hope that such comparison will allow foreigners to understand that the forest and the land is the source of Indigenous sacred knowledge in similar ways in which European settlers revere and refer to libraries.

The powerful and regenerative force of *Blood Memory* is also elicited to offer hope as a way forward to heal from the intergenerational trauma of abuse in residential schools. The last residential school only recently closed in 1996. The continued and disproportionate abduction of Indigenous children by state agents is still ongoing and nowadays operationalized through the auspices of Child Welfare Services. The disproportionate removal of Indigenous children from their families and off their land for rehoming into non-Indigenous foster care is staggering. This ominous moniker - "The Sixties Scoop" first referred to by Patrick Johnston (1983) in *Native Children and the Child Welfare System,"* is somewhat misleading since post-war assimilative policy was by no means restricted to just one decade. At its peak in the 1980's in Saskatchewan, for example one study reports 80% of children in state care were Indigenous (Sinha & Kozlowski, 2013).[133] To put this in perspective, in Canada, "Aboriginal children are so dramatically over-represented among children in foster care that the numbers of children growing up in state care today is greater than during the residential school era" (Blackstock, 2015/16: 8; TRC: 193-195). The insidious attempts to displace Indigenous people is done through multiple channels within colonial institutions. Forcing First Nations' children into white foster families is yet another means the government employs to deprive future generations of Indigenous people from the loving care of their families and the connection to their land from which their cultural knowledge and memories flow.

[133] See also: Suzanne Fournier & Ernie Crey (1997) *Stolen from our embrace: The Abduction of First Nations Children and the Restoration of Aboriginal Communities.*

Indigenous resilience refuses to simply play into the hands of the classic colonial stereotypes of severance, dispossession, destitution and victimization. Gregory Younging, an Indigenous scholar and professor at UBC and member of the Opaskwayak Cree Nation (Manitoba), urges us to consider how *Blood Memory* is not simply an amends to pathologizing intergenerational trauma as psychological damage or the effacement of memory. He rather would dwell on the positive in developing an Indigenous epistemology where "the experience of those that have gone before us is embedded in our physical and psychological being." (2009: 327). Similarly, Leilani Holmes in *Heart Knowledge, Blood Memory, and the Voice of the Land* recounts how for the Kupana Elders of Hawaii, heart knowledge "links knowledge to connection with identity, values and relationships;" Blood memory "speaks to the importance of blood family (genealogy) and the view that experience is essential to knowledge" ; and voices of the land call for 'the need to return to the many teachings that flow from the land (mother earth) as these teachings form our traditional values and ways of knowing' (2000: 47). She explains: 'these three realities constitute an ancestry of experience that' "shapes dreams, desires, intentions and purposeful activities" (*ibid.*).[134] For the Anishnaabe, (Algonquin) Lynn Gehl, speaks of "heart knowledge" as an ability to "collapse time into a single moment, even intergenerationally passed time" (2017: 55). The importance and the connection to land is vital source of *Mino Bimaadiziwin,* (in Anishinaabe this means 'the good life'), where "living in a good way is an incredible disruption of the colonial meta-narrative in and of itself" (Betasamosake Simpson, 2011: 41). As Paula Sherman says: "We are not working to find our way back to what we once were in the past, but are, instead, diligently struggling to bring forward those teachings, ceremonies, practices, and ways of relating that can help to rebuild a strong cultural base from which to resist contemporary colonialism and the cognitive elimination that accompanies the physical changes to our territories and bodies" (2008: 120).

[134] Quoted in Ormiston, 2010: 53.

5.5 Bergson & *Pure Memory*

A Bergsonian approach provides a way to think about memory as perception-geared-towards-action. I visit the philosophy of Bergson in *Matter and Memory*, especially his concept of *pure memory,* which treats human memory as processual continuity. To properly appreciate Bergson's concept of *pure memory* it is important to be aware of his convictions about metaphysics. In the late 19th century, Bergson's theories about memory and matter were deeply influenced by his rejection of strict materialism (i.e. that memory was not entirely a mechanistic phenomenon arising from interactions with the material world). Noting a trend away from the tenets of natural philosophy, Bergson opposed any attempt to excise the spiritual from the natural world. Bergson held a firm belief that matters of spirit and materials were not polar opposites but rather an essence of life itself. Bergson's contributions in *Matter and Memory,* remain hugely influential in the philosophy of Benjamin, Derrida, and Deleuze and also in other areas of art, aesthetics, psychology and cognition. As one of the most respected and acclaimed members of the French Spiritualists movement, Bergson not only aimed to demonstrate that metaphysical considerations were compatible with neuroscience and psychology, but that these considerations also sustained it (McGrath, 2020).

Bergson's notion of 'pure memory' in *Matter and Memory* (1896 /2004)[135] questions why humans are so deeply attached to the idea that the mind is pre-conceived and scripted within us rather than the more likely and plausible explanation that the mind is dynamically adapting and developing in real-time action with the world around us. Indeed, memory theorists are generally quick and careful to differentiate between kinds of memory; declarative, semantic, episodic and autobiographical, which allow us to recall general factual knowledge or revisit events from our personal past (Michaelian, 2016; Tulving & Markowitsch, 1998). These types of memory are often contrasted with procedural or implicit memory, which is of a kinaesthetic nature that unconsciously guides our skilled movements. But Bergson's strategy went further to separate

[135] Hereafter Matter and Memory abbreviated to MM

different types of memory into the ways in which they *appear* to act archivally through the mental processes of recognition, recollection and remembering from the decidedly non-archival ways that past relationships link to the present (Burton, 2008: 324).

To Bergson, human consciousness is mutually constituted by perception and memory. "With the immediate and present data of our senses we mingle a thousand details out of our past experience" (MM: 24). But perception to Bergson is not the totality of environmental stimulus that tingles our senses but rather a more limited conscious "measure of our possible action" (MM: 30). Conscious perception, he says, is incomplete because we are constantly thinning out and "discarding of what has no interest for our needs, or more generally for our functions" (ibid). This "necessary poverty" is the price we pay for being 'connected' to the world since we can't possibly take it *all* in (MM: 31). The infinitely more expansive range of possible actions we could have are further limited by the pesky habit of constantly "covering as it does with a cloak of recollections a core of immediate perception" (MM: 25). To Bergson, immediate perception gives way to bodily action of a quick-fire reflex nature, such as the way we might recoil from the heat of scalding water, whereas conscious perception is delayed, since it requires contemplation to determine actions. Either way, our perception is never a complete sensory contact with the world since it is always impregnated with our memories of lived experience. Conscious perception signifies a practical discernment geared towards action that "is but our power of choice" rather than a full gamut of unfiltered perception (MM: 26).

Bergson attempts to dismantle the commonly held belief that all memory, including bodily memory, is of an archival nature first by attacking the supposedly representational nature of conscious imagining or mental images. With semantic or episodic memory, he tells us, we only have the impression that these memories are being brought forth and drawn from an archive of "personal memory-images" stored on a physiological substrate (Burton, 2008: 326). But Bergson claims that people are prone to "the capital error of associationism" that gives rise to this false

impression (MM: 171). Take for example, the kind of memory when reciting a poem, or recalling an experience from our early childhood. Bergson tells us, these memory-images can only manifest when they are relevant and suited to our needs and interests in the present moment. Consequently, what may feel like we are digging up something from our past held in the plastic retentive capacity of our mind is actually due to the subjective experience of time and the chronological date-stamp we associate with that memorization event or initial experience. [136] In fact, Bergson tells us this memory isn't stored anywhere, it is only an imagined event that requires an unstable psychical state of associationism to trick us into believing a 'memory' is reappearing (MM: 172). The key point here is that this imagined event of conscious perception is dependent on similar sensory stimuli that provide parallel experiences to the actual objects that produced similar perceptions in the first instance.

By much the same logic Bergson dispels the convention to view habit-memory as stored in the body by pointing out that these actions emerge under a condition of 'fitness' or 'traction' among similar objects and perceptuo-motor stimuli in the present moment. Habit-memories (or procedural memories), which are acquired by the repetition of motor actions, only give us the impression they are being drawn out from the past because of the chronological association of the time when our bodies first learned these skills. Thus, bodily memories only feel like they are re-enactments of past performances when really these actualized memories can only exist as they are co-constituted with the materials and objects that provide a parallel set of sensory stimuli in the present moment. As Bergson says: "these virtual sensations themselves, in order to become real, must tend to urge the body to action, and to impress upon it those movements and attitudes of which they are the habitual antecedent" (MM: 168).

[136] What Bergson refers to as an imagined memory event, is but the virtual counterpart of the original happening. This is akin to what Tulving (2002) calls Chronesthesia – the subjective awareness of time or what Hutto and Myin (refer to as a capacity to extend our cognitive contact beyond the here and now (2017: 222).

To summarize: Humans are pre-disposed to thinking that declarative and bodily memories pre-exist in some form of physiological substrate, when it is more accurate to think about memory as an ontologically generative process in the present moment while materially engaged in activities that afford sensually similar experiences to re-imagined past events.

Building incrementally upon this, Bergson's notion of *pure memory* requires an even greater (yet absolutely worthwhile) conceptual leap. One way to think about *pure memory,* is as the 'stuff' that is neither limited by conscious perceptual filtering nor impregnated by the memories of our own past experiences. Or put another way, *pure memory* are the memories that mingle with *"pure* perception" before conscious perception has a chance to cloak it with our own limited memory repertoire of past personal experiences. Bergson calls *pure memory* a "nascent perception" that is expelled once our own memories take over (MM: 172). "From the moment that it becomes image, the past leaves the state of pure memory" (MM: 181).[137] So *pure memory* is latent yet unrealized because it only exists in pre-conscious psychical states that lay just beyond the immediate arena of filtered perception.

If we accept Bergson's assertion that the principle function of cognition is to preside over actions and are directed at making practical choices (MM: xvii), then what pragmatic use is the concept of '*pure memory*' if it simply vanishes or evaporates the moment conscious perception draws habit-memory into service and action? The value of Bergson's memory philosophy and the

[137] Here "memory-image" to Bergson does not mean image in the literal sense linking it with vision or the internal imagery of mental representations. The Bergsonian use of the word 'image' means a detachment from the part of the universe from which it materially originated. For declarative memories, this would be the moment a memory ceases to be an actual past occurrence and materializes and comes into its own "virtual counterpart" giving it the 'image' or "mark of its past origin" (MM: 173). An "image-object" for example, would be the moment an object's surfaces, edges and contours or "superficial skin" detaches from its surrounding and is picked up by our perception into the realm of our sensory awareness (MM: 28). Similarly, a body-image is our self-perception of our body as a centre for action distinct from its surroundings of other image-objects (which of course can also include other bodies and people). Curiously, though for habit-memories, (i.e. procedural) Bergson says: "they bear no mark which betrays its origin and classifies it in the past, it is part of my present" (MM: 91). Habit-memories, like walking according to Bergson should barely be called memories at all except that they may refer back to the moment these skills or actions were originally acquired.

worthwhile conceptual leap that *pure memory* presents are in the potential for an awakening. *Pure memory* is omnipotent and ever-present, existing as a pre-cursor to all our perceptions that inform our choice of action. Bergson offers: "There will no longer be any more reason to say that the past effaces itself as soon as perceived, than there is to suppose that material objects cease to exist when we cease to perceive them" (MM: 182). For Bergson, in much the same vein as an Indigenous ontology of memory, all memory that ever existed, is ever-present and potentially available provided one's sensory atunement does not supress it.

5.6 Intermittent crooked knife use among the Algonquin

In this next section I offer a case study of the canoe builder's knife to illustrate how hand tools participate in the re-animation of bodily memory and bring forward teachings and practices even after they have fallen out of use. The *Mocataugan*, or crooked knife is used extensively by the Algonquin for making nearly all things of wood, from snowshoes to baskets as well as toboggans and sleds and it is also indispensable for canoe building. This single-handed draw knife is used to trim and whittle the components of the canoe frame down to size. Blades average about as long as the width of one's hand and have a gently swooping upwardly curve beginning about the midway point. This curve allows the debitage to be directed off the end of the knife and peeled out of the way. The blade is sharpened with a shallow single bevel edge, leaving a flat sole on the underside. This prevents it from diving or biting into the wood had it been sharpened with a double bevel like a typical pocket-knife. The blade is also rather thin, which enables it to do equal duty splitting as a hand-held froe ahead of the actual cutting edge of the knife. In combination with selectively harvested clear knot-free, straight-grain, softwoods like cedar and spruce the crooked knife can make remarkably quick and accurate work of reducing roughly hewn wood to proper size.

In 1748, a report presented to British Parliament detailing the trade goods the Hudson's Bay Company brought to the Canadian colony, lists "mocotaugans." It is the only trade item on the entire list that is called by its name in the Algonquin language.[138] The Hudson's Bay blades were made in Sheffield by the cutlery guilds established since the time of Chaucer. It is impossible to say just how popular a trade item this would have been among the Indigenous people, (only a few have been found in excavations around the Hudson's Bay trading posts) but it does list a price. Two "mocotaugan" blades could be bartered for one beaver pelt. Early ethnographic accounts also remark upon its utilitarian and functional value. Near the end of the 19th century an ethnographer writing for the Smithsonian National Museum noted: "The Canadian Indians and those of the northern United States, having only soft material and bark to work upon, restrict themselves mostly to the long-bladed curved knife" (Mason 1899: 732). However, despite the undeniable importance and implications tool use has for memory, the archaeological literature on the crooked knife is thus far limited to the study of regional typologies and metallurgical analysis (e.g. Pilon & Zacharias 1984).

In the archaeological record we find the first evidence of crooked knife use among the Archaic Old Copper Complex (OCC) in the Great Lakes Region dating back about 8,500 – 3,500 B.P. (Pompeani, et. al. 2021). There is also evidence of large-scale mining between 6,500 – 5,400 B.P. on Isle Royale in the middle of Lake Superior, which also indicates the people were regularly travelling by canoe to the island and transporting the copper ore back to the mainland for metallurgical processing (Pompeani et. al. 2014). What's interesting though, for reasons that are still poorly understood, is that during the transition from Archaic (10,000 -3,000 B.P.) to Woodland culture (3,000 – 1,000 B.P.) the use of copper for tools declined. By the Early Woodland period, copper appeared to be reserved for ornamentation and more symbolic applications rather than utilitarian purposes (Bebber et. al., 2019; 2021). This presents a bit of a mystery, as

[138] See: British Parliament [Reprint 1803], *Reports from Committees of the House of Commons*. Vol. II. Miscellaneous Subjects: 1738-1765, Appendix XIX, p. 257. "Report from the Committee appointed to enquire into the State and Condition of the Countries adjoining Hudson's Bay, and of the Trade carried on there." [originally printed in 1749]

it is generally assumed that once people adopt technologically superior materials (i.e. metal over stone) they generally do not regress unless they are forced to do so. Binford suggests this technological "devolution" was in fact sociotechnic and not technomic (1962: 221). Binford hypothesized: "For one tool to be adaptively more efficient than another there must be either a lowering of energy expenditure per unit of energy conservation in *task performance,* or increase in energy conservation per unit of performance over constant energy expenditure in *tool production*" (ibid.). All other evidence during this transition points to ever-increasing technological and social complexities, Binford suggests that copper tools became a prestige item that offered very little discernable advantage when compared to analogous blades made of stone or awls made of bone. Excavations of late Old Copper Culture graves offerings finds an increased concentration of copper artefacts among the burials of women and children, which corroborates that a social shift occurred to associate copper with bride-wealth (Pleger, 2002; Pleger & Stoltman, 2009).[139]

Fig. 22. Archaic Period copper draw knife blades

Early explorers and merchants upon their arrival to the eastern seaboard of North America remark that the Indigenous people were of the stone-age. And yet surprisingly that's not due to a lack of access to metal nor of the knowledge of how to work it. The French colonists had heard rumours of a great inland freshwater sea (the Great Lakes) whose shores and riverbanks

[139] In Bebber (2021) The Role of Functional Efficiency in the Decline of North America's Copper Culture (8000–3000 BP): an Experimental, Ecological, and Evolutionary Approach.

contained copper mines. In June 1610, about 25 miles upriver from Quebec (city), Champlain encounters two men in a canoe. He says: "[…] the Algonquin Indian, who was one of their chiefs, drew out of a sack a piece of copper a foot long, which he presented to me. It was very fine and pure. He gave me to understand that the metal was abundant where he had obtained it, which was on the bank of a river near a large lake. He said that it was taken out in pieces, and when melted was made into sheets and smoothed out with stones" (Biggar, 1925a: 123).[140] When he asked about the location of the mines, the Algonquin informed him that they obtain it in trade from the "good Iroquois" (meaning the Huron). There is a common misconception that metal tools offer increased functional efficiency, and that canoe craft was drastically refined once Europeans arrived in North America and offered trade-iron to the Indigenous people.

What's even more interesting is that as soon as the first Europeans arrived and began importing iron, Indigenous people had no trouble transforming it into the same kind of single bevel copper crooked knife draw blades that had fallen into disuse some 3000 years prior. An MET analysis would caution against thinking this is a coincidence or simply a case of repetition where the same tool technology was forgotten and re-invented independently at a later point in time. Rather, given what we know about an Indigenous ontology of memory, it is more fruitful to explore whether there was sufficient continuity in the Algonquin's material engagements with the forest and the trees that was able to sustain crooked-knife use to be able to re-enact a seamless return of a seemingly long-lost technology. A MET analysis of deep continuity between mind and our material environment can offer a new directions in archaeological investigations of memory to explain this so-called technical 'devolution' of metal knives and the re-emergence of the metal crooked knife after thousands of years.

[140] [Translated from original text] "le sauvage Algoumequin, qui estoit un de leurs chefs, tira d'un sac une pièce de cuivre de la longueur d'un pied, qu'il me donna, lequel estoit fort beau & bien franc, me donnant à entendre qu'il y en avoit en quantité là où il l'avoit pris, qui estoit sur le bort d'une riviere proche d'un grand lac, & qu'ils le prenoient par morceaux, & le faisant fondre le mettoient en lames, & avec des pierres le rendoient uny. » (211/359) in https://www.gutenberg.org/files/36698/36698.txt

5.7 Carving Canoe ribs the Algonquin way

Murphy's Point Provincial Park sits overlooking Hoggs Bay on the north shore of Big Rideau Lake in Lanark County Ontario. The summer's breeze carries swarms of bright green and rusty red dragonflies performing stunning acrobatic as they stealthily intercept other insects mid-flight. Wild deer graze on the grassy slopes totally unphased by the sounds of screaming children vacationing at the beach. An outcropping of guano baked white granite rocks attended by resting gulls overlooks the main channel where steady streams of motorized pleasure-craft cruise the shores thickly lined with summer cottages. Chuck looks out over the water and says *pasapkedjiwanong* he pauses, then adds: **"**It means river that runs between the rocks." Though the Algonquin name for this place is still on the tip of his tongue, there are no more Algonquin living here.

Not far from here in the 1890's a local doctor from the town of Perth named T.W. Beeman began collecting archaeological artefacts on the shores of the Rideau Lakes. Prior to this there had been the occasional surface finds collected by farmers and cottager and a few flint arrow points turned up in the dredging and building of the canal itself in the 1820's, but there had been no systematic archaeology conducted in the area. From the fourth annual archaeology report in Ontario, Beeman wrote:

> "The Rideau seems to have been the principal Indian resort, as here are found in greatest quantities, evidences of an occupation that must have extended over a great length of time. […] every bit of sandy beach (at the mouth of streams) …. was sure to yield large numbers of specimens. Following up the streams, every small lake showed one or more old village sites." (Beeman, 1892)

Beeman was at least a couple generation too late if he was hoping to meet the Algonquin who lived, as he said, at every small lake and the mouth of every stream.[141] In a letter dated 1817 from William Bell from the town of Perth to Reverend Dr. James Hall:

> The native Indians are not numerous, in this neighbourhood. Since we came here, I have seen only two hunting parties in the town, and now and then a man and his squaw [*offensive term for the wife of an Indigenous man]* selling baskets made of birch bark. They all carry the tomahawk, but seem to be very quiet and inoffensive.[142]

Murphy's Point Provincial Park employs a core group of conservation biologists and a steady stream of summer interns from the biology and environmental sciences departments of the local colleges and universities. In recent years, however, they have conceded that there is an uncomfortable story missing from the usual signposts and placards raising public awareness about the fragile ecosystem and fauna. Gradually, the provincial parks' narrative is widening beyond the usual presentation of conservation and of a Canadian 'wilderness' as pristine and beautiful, to acknowledge that this park, like many others, has a colonial legacy and is situated on stolen Indigenous land. This is the second summer that Chuck has been invited to showcase birch bark canoe building as part of the provincial park's summer program offerings.

Throughout the manufacture and the assembly of the canoe, Chuck keeps his crooked knife close at hand to adjust and trim various frame members and fit them together. Nothing is measured ahead of time. The knife participates in this ad-hoc assembly by trimming a little here and a little there until the steady workings of materials converge towards the form of a canoe. No calamity comes from taking off a little too much by mistake. If a rib, for example, is trimmed too short, it is just brought forward to a new location where it finds a better fit. There are no actual measurements that guide the conceptual or even the execution of the assembly. In many

[141] Chief Constant Pinesi in the 1830's was forced to give up traditional hunting grounds and villages along the Pasapkedjiwanong (Rideau River) after his petitions to government proved unsuccessful. The British began construction of the Rideau Canal and encouraged settlements of British Loyalists.
[142] In Parks Canada (1998: 49) – The Cultural Landscapes of the Rideau Canal Corridor

instances the specific peculiarities of the materials themselves guide the builder in arriving at the best dimensions. For example, when the gunwales are shortened by a few inches because of a flaw in the wood. In this way the living tree and the peculiarities of grain or branch knots participates in the decisions involved that determine the overall length of the canoe, even if it ends up being a few inches, or foot shorter.

Fig. 23. Chuck using his *mocataugan*

On rib carving day, Chuck's morning began with a pile of rough split cedar on his right side and a crooked knife in his hand steadily carving them into a pile of finished trimmed ribs on his left. A small Algonquin hunting canoe, like the one he is building at the park, requires approximately 28 ribs. This number isn't arbitrary, it is due to the spacing of clusters of root lashings along the length of the sides of the canoe which are spaced at intervals of roughly the width of one's own hand. Each rib begins from a piece of wood that is about as long as the height from the ground to his chin. This is plenty long to span the belly of the canoe at its widest in the midsection. I watch Chuck, as he begins fashioning one rib until he deems it good enough and to his liking and he then uses this rib to compare and evenly match all subsequent ribs.

The ribs are measured anthropometrically against proportions of his own body and then comparatively against themselves. Curiously, before setting the rib aside in the finished pile he notches one end with a little v-cut and he says: “That’s the trunk of the tree.”

J: - “You mean the base of the tree?” I ask, to clarify
C: - “Yeah, “It’s stiffer at the base of the tree.”
“My grandfather did that.” He adds.

What is not immediately clear to me is to what extent he is tracking the stiffer end of the rib. It is difficult to resist searching for a logical explanation. The stiff ends of the ribs, I am later told, must be alternated when they are installed so the hull comes out symmetrical. The skeptic in me thought for a moment what a logistical nightmare it must be to keep track of which end was actually at the base of the tree. After all, a canoe rib would have been handled end over end countless of times throughout its making; as it was hauled from the bush, rolled out of the back of the pickup truck, tossed onto the ground beside the building site, split into rough lathes with wedges and bundled together in packs, submerged in the river to keep it green and pliable. How could he be so sure the end he notched with his crooked knife this late in the process, was actually the butt end of the log at the base of the tree? Maybe it doesn’t matter. His assessment when he checks the limberness of each rib for flexibility before he sets it down and continues just as his grandfather would have to notch the stiffer end is what’s important to keep the hull symmetrical so that tracks and glides straight when paddled.

Chuck’s calling attention to his grandfather’s teachings can be understood as the reaffirming of his right to speak on such matters – not because he is personally an authority on the subject, but more so because the awareness of which end of the rib is stiffer is an important detail that was handed down to him through the generations. In Indigenous narrative practices the appropriate protocol is to defer to the Elders for matters of important cultural knowledge. As Darnell explains:

"the deferral of competence", reflects a deeply rooted narrative practice that values modesty, where the speaker is expected to downplay one's own wisdom and personal competencies by allowing the Elder's wisdom to speak through them (1989: 324-328).

Marina Westbrook, from the Nipissing First Nations and program coordinator of Indigenous Studies at Algonquin College, is with us today. Marina grew up in a family with an Anishnaabe mother and a Scottish father. As a child she did not have the opportunity to learn to speak Algonquin or to connect with her Indigenous heritage.[143] Only much later in life would her mother begin to show her some craft work she had done making bark baskets embroidered with porcupine quills and begin to see this as a sense of pride. Due to her mother's advanced stage of Alzheimer's, Marina tells me that she wished she had a chance to ask her mother so much more when she was still able to recall her own childhood and what it was like growing up among the Nipissing First Nations in the 1930's and 40's. Today Marina wants to try her hand at carving canoe ribs and to feel what her maternal grandparents might have felt as they held a crooked knife and carved cedar.

Chuck is happy to take a break and sit with his dog in his lap as he looks out over the lake, with hardly any concern and absolutely no oversight or instruction for Marina's first attempts at using a crooked knife. Marina is remarkably intuitively figuring out that the affordances of the wood and the ergonomics of the grip of the knife are all that is needed to get started and guide her posture and steer her actions. For instance, the crooked knife she holds in her hand determines

[143] There's more to this story. The woman who raised Marina was not her biological mother. Like many Indigenous women, her biological mother was forced to give her daughter up for adoption during the 60's scoop. After a couple years in foster care in Toronto, her adoptive mother also from Nipissing First Nations, who knew her biological mother's tragic story, went looking for Marina and managed to find her and adopt her. Her adoptive mother's husband was an engineer and Scottish and this looked was favourably looked upon when child welfare agencies decided where to re-home Indigenous children. Her adoptive mother was raised feeling ashamed of being Indigenous and married a European man and moved to Toronto to give her children an opportunity to get off the reserve and out of poverty and go to school in the city. Her adoptive mother never spoke a word of Algonquin to her children and never shared any stories about their Algonquin heritage. These occurrences are not at all uncommon for this era.

Fig. 24. Marina tries her hand with the *mocataugan*

that her cutting stroke will be initiated by being pulled towards her. The angle of attack that she holds the knife will be corrected by making minor adjustments when she either feels the blade biting into the wood and gouging or whether it chatters or glazes ineffectually along the surface. This does not come by sheer mastery of skill or intergenerational teaching – clearly as Chuck continues to have very little to do with her instruction. But rather it comes from the whole system of mind that includes the interface between the body, the crooked knife, and the wood itself. When Marina finds this sweet spot she is rewarded by the attunement of her haptic senses as the body-knife-wood guides her into finding its own way of making the work easy. Peeling away nice smooth curls of wood are the desired result. These long thin peeled woodchips falling to the ground are the desired aftermath of a successful stroke with the crooked knife. The sound is satisfying when you get it just right. I observe the agency of the materials and the knife as they

guide her into macro and micro kinesthetic adjustments based on the somatic feedback she is receiving from the knife and the wood.

Smith says: "By working in historical practices, we can encounter the textures of objects afresh, engaging affectively with the collaborative processes and tribulations of skilled technique, we can potentially gain 'a firmer handhold on the past than would be the case for nonexternalized mental processes' (Smith 2012: 12)[144] It makes no sense to think about bodily memory as something that is inscribed on a physiological substrate or pre-existing to the moment it is deployed. It is much more productive to think about memory for the novice apprentice as an ontologically generative process, or as Bergson would say as processual continuity, where our material engagements afford sensuously similar or parallel experiences to imagined or real past events.

Returning for a moment to Indigenous ontology of blood memory, we observe in Chuck and in Marina the deferral to the authority and honouring respect for Mother Earth as they acknowledge the forest and the wood for sustaining life, carrying stories and informing cultural practices. As Mojica says: "It regenerates my creative source by placing me on the life-giving land in an embodied research process that requires me to walk on, touch, feel, smell, and absorb the stories, forms, and structures of effigy mounds and earth works, to connect to the ancestors who built them and to the peoples who still inhabit the region. Simultaneous to this sacred work, I am challenged to "talk back" to colonial erasure, to peel away that veil, to refocus my lens" (2012: 220). As Mojica suggests, "*Blood Memory"* coagulates the transgenerational dimensions of memory between Indigenous lands and Indigenous bodies even when the lineage has been interrupted for generations (Mojica, 2011; Lachance, 2018). Marina is keenly aware of the powerfully generative relations that are rooted between the ways her body senses and comes to know the cedar as she touches in her hands the memories and lifeways of her ancestors that are

[144] In Sutton, & Keene 2017: 55

in constant ebb and flow through the land. In a sense, the need to possess the specific knowledge or a trace of the memory of a crooked knife or even how to use a crooked knife is alleviated by the novice rib carver being fully immersed in the cognitive life of trees as much as the cognitive life of the minds of all people who carved ribs who came before her.

5.8 Material Inheritances: An analysis with MET & Stiegler's Exteriorization of Memory

In this next section I use an MET analysis to return to the conundrum of how the Algonquin were apparently able to just re-patent a crooked knife blade 3000 years after it fell into disuse by their ancestors. MET's framework responds to the critiques of the extended mind's memory where Clark and Chalmer's storage version is lacking by pointing towards Stiegler's (1998) "exteriorization of memory" for a better alternative (Malafouris, 2013: 154-155). Stiegler, influenced in part by French archaeologist Leroi-Gourhan who proposed that humans co-evolved with tools to become a product of their own "original technicity" (1993). Stiegler frames the emergence of tool use in early hominins, (something which humans do on unprecedented levels compared to the rest of the animal kingdom) as "memories of rupture." With tool use early hominids were provided a new vector or third kind of liberating memory, which he called 'epiphylogenetics.' Up until this point in hominid memory was predominantly a factor of 1) the biological inscription of memory through "hereditary genetic capital" and 2) individually accumulated "epigenetic" life memories, (1998: 177). The development of lithic tools in the Lower Palaeolithic Period (2.7 million years ago) gave rise to a newly portable "artificial memory support" system that 'bequeathed the memory and past experiences of the preceding generations onto later ones' (Stiegler, 1998: 159).

Steigler's epiphylogenetics can be understood as a type of memory that is intimately entangled with death where as far as Stiegler is concerned the fundamental fact of human existence is in "the transmission and recording of experience beyond the individual memory-span" (Vaccari &

Barnet, 2009: 13). The problem to overcome, however, is not that epigenetic life memories necessarily die out with the loss of individual life. Quite the contrary, to Stiegler, the epigenetic layers of life "passes itself down in "the order of survival" [survivance] and to posterity as a gift as well as a debt, that is as a destiny" (Stiegler, 1998: 140). What he means by this is that ancestral lifeways are inherited and transmitted as much through individuals or small clusters of people as they are through the physical features of geography that impose certain constraints upon our modes of survival. What is significant here is for the first time, with epiphylogenesis and tool use, hominids could exceed the transmission of memories beyond the haptic sensorium that were bound by biological constraints, into the material or artefactual since tools carry forward and "conserve the accumulation and sedimentation of successive epigenesis, mutually articulated." (ibid.) But instead of reifying Platonic dualisms and setting up anew the opposition between an internal *episteme* (intellect/thought) and external *tekhne* (craft/art), Stiegler argues that the already-present prosthetic technology is paradoxical in that no sooner does the human who takes up a tool, do they also find themselves being invented and exteriorized by the techno-logical. "[T]here is no exteriorization that does not point to a movement from interior to exterior. Nevertheless, the interior is inverted in this movement; it can therefore not precede it. Interior and exterior are consequently constituted in a movement that invents both one and the other." (Stiegler 1998: 142).[145]

Other theorists on the active nature of environmental learning swing too far and deny the intelligence of bodies in their skillful dealings with the world. Dreyfus (1986), for example, dissented on cognitivism's attempt to formalize the richness of human experience by building off of a Heideggerian concepts of *background* – as neither active, nor passive, but rather as *readiness*

[145] Steigler insists that epiphylogenetics is not just the rigid sequential action program imposed by stabilized forms of technology. Though his support of this is fairly weak. The only reassurances he offers is by pointing out that the appearance of particular techniques and technologies are also inextricably linked to a particular geographical zone. As such these geographic zones may favour a certain kind of tool, like the hand axe, for example, which in turn favour's one's survival, which in turn provides a selection that passes down some tools and not others. To this he reasons that the prosthetic technology is no more a factor of deterministic re-enactments on future generations than the rest of the natural environment at large, which is also reproducing similar behaviours in the limits it imposes on the options available for subsistence economies and living conditions. (1998: 36, 54).

to action with a body that is "simply solicited by the situation to get into equilibrium with it" (2002: 378). He proposed that people are always moving to position themselves towards a "maximal grip" or optimal relationship with the world. But Dreyfus unfortunately also viewed most bodily movements merely as an "absorbed-coping" behaviour and saw "mindless everyday coping skills as the basis of all intelligibility" (1991: 3). To Dreyfus most of our skillful dealings with our environment involved direct physical responses that were circumscriptive of deliberative intensions and thought. For instance, when we enter a room and navigate our path so as not to bump into the furniture or the way we quite naturally manoeuvre to front and center of a painting in an art gallery to bring us to an optimal viewing experience. These aren't necessarily deliberate pre-meditated actions, but rather something, Dreyfus says, that bodies and objects do together on a direct level of interaction. Construed in this way our embodied memories find fitness in direct relations with a material world that is also projecting and soliciting the ways it affords its engagement. What is valuable to keep in mind here is the way background or the environment can indeed conscript us into direct relations with materials and objects through their material affordances. However, our bodies are far from the unintelligent beings Dreyfus describes.

It is evident that Stiegler's theory of prosthetic technology implies a strong element of material agency. Stiegler's externalisation of memory as a form of cognitive prosthesis, brings us much closer to the extended mind's memory developed within a MET framework. From MET's perspective: "Crucial elements remain 'un-represented' and on the 'outside'. Those elements preserve a physical or artefactual core upon which bodily and neural re-enaction will take place." (Malafouris & Koukouti, 2018: 162). With MET, technology and tools are not the simple externalization of the maker's mental thought process, nor are objects merely preserved evidence of embodied routines or procedural skills as a type of action program made available conscripting later generations of humans to enact the same patterns or habits of action. The real potential for an extended mind is in the profound reconfiguration in thinking about the ways external resources cohabitate the cognitive lives of humans. The agency of materials and tools

conscript our bodies into a familiar pattern of behaviour is powerfully transformative in the re-enactment of mnemonic processes. As Malafouris explains: "[Materials] impose their own dynamics, consciousness, and temporality on our bio-cultural evolutionary continuum. […] They help us to move across the scales of time and to construct bridges between temporal phenomena that operate at different experiential levels." (2013: 246-247). Materials and tools offer up commonalities on an experiential level to subsequent generations. A Stieglerian approach recognizes the crooked knife for its ability to brings forth memories that are deeply rooted in the geography and of the forest itself. Indeed, one could conceive of the knife for its ability to relieve the canoe builder from having to remember anything at all. Even in the hands of the unskilled, it invokes a cumulatively tried and tested technique. But because the blade is just one participant of the entire ecological system that remembers, it becomes entirely possible to return to the same design of cutting implement even after it fell into disuse for thousands of years.

5.9 Conclusion

MET's focus on the active nature of cognition through our material engagements is less concerned with where memories might be located (or forgotten), and much more interested in understanding what environmental resources *do* in the flow of mnemonic acts of remembrance. By focusing too narrowly on the locus or emplacement of memory, storage models treat minds, bodies, and external resources as interchangeable vessels undermining how the relational practices matter throughout the mnemonic process. Declarative forms (e.g., my grandfather told me) are often imbricated and work simultaneously with the non-symbolic roles artefacts that are attended to by their sensory-tactile qualities. Procedural skills defined as the embodied skills committed to muscle memory run the risk of treating memory purely as individual achievement. Searching for memories in the body, and not as a generative process of our material engagements detracts from how our material inheritances are scaffolded within specific environments and transposed over generations.

Enactive conception of bodily memory challenges conventional forms of archival memory, because here our behaviours are understood to be every bit as likely elicited by the affordances in the environment (and not a pre-determined sequence, that has been committed to muscle memory). These affordances are also never static, for with every action there is bi-directional and ever-cumulative feedback of action and causal effects in a dynamic world are constantly offering up new series of affordances and events. An understanding of the way the body remembers and performs its practical skills, when working within a MET framework, then must allow for a strong component of pre-reflexive, immediate and direct sensory awareness of our surroundings, which involves proprioception – That is an innate and automatic ability to be in control of one's own body, but also to do so with a spatial awareness in relation to other bodies and objects (Malafouris, 2018: 10). In effect our procedural skills depend on our body's ability to constantly adjust itself within an ever-unfolding environment presenting cascades of new affordances. In MET Malafouris refers to this as "creative thinging" - the process in which humans think "with" and "through" things in action primarily by moving their bodies and their hands (Malafouris, 2014, 2019a, 2019b). Memory thus conceived must account for the materially generative processes of an extended and enactive mind.

Chapter 6

Conclusion

I designed my thesis around a participatory community-based research creation project building three traditional Algonquin birch bark canoes. In this research I set out to investigate the multimodal ways that memories flow from our ecological activity. Through my main research question, "How do people use their senses to transform materials into complex tools?" I explored how landscapes and natural resources transmit cultural memories over vast periods of time. My main method of investigation was sensory ethnography, and I argued for the need to bring an anthropology of the senses more prominently into the archaeological fold. Using theoretical frameworks in cognitive archaeology, I focused on complex aspects of memory that are often little understood. One conundrum, for example, is that an Indigenous ontology includes notions of memory where ancestral memories flow directly from the land, remarkably even after long periods of interruption. Multi-species relationships within living geographies of forests and waterways engender new philosophical questions about how these dimensions work together with human and non-human agents to transmit culture.

Central to discussions of transgenerational memory among Indigenous scholars is the concept of blood memory. Blood memory articulates how transformative spiritual powers can interact with histories and geographies on multiple levels to offer Indigenous people an inheritance of lifeways, culture, and art. As Mojica elaborates: "It regenerates my creative source by placing me on the life-giving land in an embodied research process that requires me to walk on, touch, feel, smell, and absorb the stories, to connect to the ancestors and to the peoples who still inhabit the region' (2012: 220). , Nishnaabeg activist and scholar Leanne Betasamosake Simpson attests: "Our relationship to the land itself generates the processes, practices, and knowledges that inform our political systems, and through which we practice solidarity." (Coulthard & Betasamosake Simpson, 2016: 254).

These notions of transgenerational memory that were taken so matter-of-factually in Indigenous ontology seemed slippery, elusive, and down-right counter-intuitive in continental philosophies of mind and existing conceptual models of memory in the cognitive sciences. Consequently, the ways in which Indigenous people re-enact, and re-member ancestral memories presents quite a blind spot within the cognitive sciences. My research works to address this blind spot. By setting aside these assumptions, I vigorously pursued the anthropological study of transgenerational dimensions of memory, and reached new and exciting conclusions about the enduring and indissoluble cognitive relations between landscapes and their inhabitants in cross-cultural contexts.

Theories on memory in the cognitive sciences have been constrained by intracranialist, brain-bound notions of mind. The root metaphor of the storage-and-retrieval platform, which remains ubiquitous in memory theory, is fraught with problems. The continued use of storage metaphors keeps researchers farther from understanding crucial aspects of memory. Even within 4E theories of mind, which purport to be cutting-edge and less reliant on brain-bound frameworks, the storage metaphor remains deeply entrenched. As such, 4E cognition is not up to the analytical task of explaining or even encountering the phenomenon of transgenerational memory. The extended and distributed approaches are further constrained by computational models that center around the flow of data or information throughout man-made technological systems. Indigenous notions of transgenerational memory defy human exceptionalism and complicate the usual inductive memory logic, which assumes a direct lineage of social transmission through a combination of psychical and physical mediums. Often glossed over or missed entirely, the deeply connected ways that memories flow from the land offers fragments of hope in a global environment that is increasingly ill-suited to traditional skills and lifeways.

My fieldwork experience working with Indigenous canoe builders in Canada taught me that hearing and touch are two of the main sensory modes that interacted with material agents to transmit ancestral knowledge. However, though potentially promising, the concept of 'sensing memories' did not in itself provide an alternate solution to the legacy of the storage-and-retrieval metaphors. Hamilakis (2013), for example, in the *Archaeology and the Senses*, develops a theory about sensorial assemblages. His theory is that memories arrive seemingly pre-loaded through sensory interactions with artefactual remains. He leans heavily on the idea of a sensory repository stored within the existing man-made material cultural record. But he is mute about the interactions with other living things outside of the built environment. From this work it is possible to glean absolutely nothing about the roles that natural materials have in sustaining the process of mnemonic flow. More difficult questions about our material engagements with the beings and substances of nonhuman nature, un-transformed by prior human intervention, have thus far not been given proper consideration in archaeological theory. It is here that my work makes its most crucial intervention.

I turned to MET for its multi-pronged interpretive framework as I worked through the ecology of birch bark canoe building and honed in on the trifecta of MET's tenets: 1) that of an extended mind, but not in the simple 'offloaded' storage sense but rather one that is deeply coupled and contiguous with our material surroundings; 2) that of material agency, which reinvigorates and rebalances causality between mental and physical realms; and 3) that of enactive signification, which not only thinks through things in action, but furthermore treats the material expressions as constitutive of the thinking itself. MET provided much of the analytical traction needed to dispel the awkwardness of talking about memory in the usual tropes of an extended and external exographic storage system or internal theoretical entities like memory traces. MET as an interpretive framework excels in this regard, and it has allowed me to study problems in archaeology and in cognition such as the little understood phenomena of transgenerational memory. These promising theoretical advancements in MET and the compelling results in their

application towards the study of memory, merit a thorough re-examination in archaeology of the interactions between people and material culture.

This prompted me to use MET from the theoretical vantage of an extended mind to reflect on what it means to harvest bark in this particular place and time, (i.e., on Indigenous territory in the age of wide-spread extractive capitalism) where the ecologies of the forest can still be immediately sensed. Accounts from my fieldwork that attest to the feelings of a deep ancestral connection when harvesting and preparing natural materials from the forest are juxtaposed with historical and environmental storytelling. Multi-vocal testimonials, including audio recordings from the sounds of the bark harvest, document the sensory interactions that occur between people and trees and in the extra-linguistic conversation between canoe makers and their materials. Environmental storytelling serves to call attention to the ways the colonial landscape has drastically mediated the embodied memories of Indigenous canoe builders. The premise being: If the lived environment is as deeply integrated and contiguous with mind and memory as my research demonstrates, then the destruction and desecration of traditional Indigenous territory and the forcible removal of Indigenous people from their land is not merely experienced as ecological or material loss but also a substantial loss of cognitive resources. These vibrant sensory experiences, which are indispensable to the ontology of memory for the Algonquin people, highlight the diverse ways Indigenous memory is grounded in the generative cognitive relations that occur between landscapes and sensing bodies in motion.

Turning to archaeoacoustics and listening to trees, I go on to use Feld's concept of *acoustemology* and Benjamin's concept of the *mimetic archive* to examine how landscapes, and their natural resources like rivers and forests, help to create the conditions for our mimetic faculties and bring about patterns of remembrance. My ethnography of splitting spruce roots and harvesting cedar revealed the ways memories are deeply sedimented in the sonic worlds of natural environments. Here, as we heard, mnemonic flow stems from our material engagements and the sensuous

similarities we find there with ancestral practices. This then allows other historic potentialities to press upon the present moment and leak out across vast periods of time.

The haptic dimensions of using hand tools like the *mocataugan* (crooked knife) serves also as a powerfully enactive memory generating resource. My analysis is based in MET's turn to enactivism and on Stiegler's notion of "memories of rupture" - a new vector or third kind of liberating memory, which he refers to as 'epiphylogenetics.' This type of memory, which exceeds an individual's or social group's memory span, is transmitted through prosthetic technologies that come into being out of the successive livelihoods that are mutually articulated within a dynamic physical environment. However, in this case, the archaeological record reveals that the single-bevel copper draw knives had fallen into disuse and re-emerged some 2500 years later with the introduction of trade iron. Working through the historical processes of tool-use with novice participants in the canoe building workshops reveals how memories of rupture cohabitate past and present moments of our cognitive becoming. Taken alongside my ethnographic insights, this creates a compelling case for how memories can be transmitted through the agency of material inheritances even after they have fallen into disuse for thousands of years.

The Algonquin model of memory offers another way of thinking and being in the world that is starkly different from the one cognitive science has erroneously assumed to be universal. In this thesis, I have dismantled some of our most basic assumptions about memory. Aided by MET, I have brought together diverse models from various fields to move into unchartered interdisciplinary territory. My hope is that this cross-cultural research may serve as the basis for further studies in sensory archaeology, where there is a great need for new methods in research on cultural recovery and revitalisation. The aspects of transgenerational memory that I have investigated here are conceptually challenging, and for that reason all the more vital to examine. The canoe building workshops create opportunities for Indigenous youth to extend their cognitive contact with the world and to construct new memories as they emerge from the

evocative ancestral relationships of shared sensory associations arising from their material engagements. Approaching the sensorium and the diversity of corporeal experiences in the natural and made environment, offers a different way of thinking about the causal and ontological relationships between memory and external resources and offers a different way forward in a world that is so badly wrapped up in extractive colonialism.

Fig. 25. Trinity and her teacher, memories articulated

References

Abram, D. (2017) Notes on Technology and Animism in an Era of Ecological Wipe-Out. Available at http://fore.yale.edu/files/Abram.pdf

Ackerman, D. (1990) *A Natural History of the Senses.* London: Chapman.

Adams, F. & Aizawa, K. (2008). *The bounds of cognition.* Oxford: Blackwell.

Addis, D.R., Wong, A.T. & Schacter, D.L. (2007) Remembering the past and imagining the future: Common and distinct neural substrates during event construction and elaboration. *Neuropsychologia, 45*: 1363-1377.

AFN (Dec. 8-10, 2015) Special Chiefs Assembly. *Support for an Algonquin of Barriere Lake – Canada Reconciliation Process.* [Gatineau, QC], https://www.afn.ca/uploads/files/draft_resolutions_to_2015_afn_sca.pdf

Ahissar, M. & Hochstein, S. (1997) Task difficulty and the specificity of perceptual learning. *Nature* 387: 401-406.

Allen, C. (1999) Blood (and) Memory. *American Literature: A Journal of Literary History, Criticism and Bibliography* 71(1): 92-116.

Altman, M. (1983) Seigniorial Tenure in New France, 1688-1739 : An Essay on Income Distribution and Retarded Economic Development. *Historical Reflections Vol. 10*(3) : 335-375.

Altmeyer, G. (1995) "Three Ideas of Nature in Canada, 1893-1914," in *Consuming Canada: Readings in Environmental History*, eds. Chad Gaffield and Pam Gaffield, Toronto: Copp Clark Ltd.

Angell, J.R. (1906) Memory. In *An Introductory Study of the Structure and Function of Human Conscious:* 184-202. Third edition, New York: Henry Holt and Company.

Arsenault, D. (2004) Analyzing and Dating the Nisula Site, Quebec. In *The Rock Art of Eastern North America: Capturing Images and Insights,* Corol Diaz-Granados and James R. Duncan (eds.) University of Alabama Press: Tuscaloosa, 344-360.

Arsenault, D., Gagnon, L., Martijn C. A. & Watchman, A. (1995) Le Projet Nisula : Recherche Pluridisciplinaire Autour d'un Site à Pictogrammes (DeEh-1) en Haute-Côte-Nord. In *Archéologies québécoises.* (eds.) A.M. Balac, C. Chapdelaine, B. Clermont and F. Duguay. Recherches Amérindiennes au Québec, Série Paléo-Québec no. 23. Montréal, Québec : 17-57.

Arsenault D. & Zawadzka D. (2014) Spiritual Places: Canadian Shield Rock Art Within Its Sacred Landscape. In: Gillette D., Greer M., Helene Hayward M., Breen Murray W. (eds) Rock Art and Sacred Landscapes. One World Archaeology, vol 8. Springer, New York, NY.

Baddeley, A. (1986) *Working memory.* New York: Oxford University Press.

Baddeley, A. (1997) *Human memory: Theory and practice.* Hove, East Sussex, UK: Psychology Press.

Barnier, A. J. & Sutton, J. (2008) From individual to collective memory: theoretical and empirical perspectives. *Memory, 16*(3), 177-182.

Barriere Lake Solidarity. (Dec. 10, 2008) *Press Release – Quebec judge imprisons Algonquin Chief for two months for peaceful protest: Crown asks for one year to send "clear message" to impoverished community.* [Barriere Lake, QC]. Accessed Nov 20, 2018. http://www.barrierelakesolidarity.org/2008/12/quebec-judge-imprisons-algonquin-chief.html

Barriere Lake Solidarity. (August 11, 2010) *Press Release – Barrier Lake Algonquins mount boycott of government-imposed election poll in face of threats of arrest by Quebec police* [Barriere Lake, QC]. Accessed Nov 20, 2018. http://www.barrierelakesolidarity.org/2010/08/say-no-to-canadas-armed-imposition-of.html

Barriere Lake Solidarity. (Aug. 21, 2012) *Press Release – Clarification from Barriere Lake Community Member Tony Wawatie* [Barriere Lake, QC]. Accessed Nov 20, 2018. http://www.barrierelakesolidarity.org/2012/08/some-clarifications-regarding-current.html

Bartlett, F.C. (1932) *Remembering: A study in experimental and social psychology.* Cambridge, UK: Cambridge University Press.

Basso, K. (1996) *Wisdom sits in places: Landscape and language among the western apache.* Albuquerque: University of New Mexico Press.

Bateson, G. (1972) *Steps to an Ecology of Mind: Collected Essays in Anthropology, Psychiatry, Evolution, and Epistemology.* Chicago, IL: University of Chicago Press.

Barbeau, M. (1914) Supernatural Beings of the Huron and Wyandot. *American Anthropologist, 16* (2): 288-313.

Bebber, M.R., Key, A.J.M., Fisch, M., Meindle, R., & Eren, M.I. (2019) The Exceptional Abandonment of metal tools by North American Hunter-Gatheres, 3000 B.O. *Scientific Reports.*

Bebber, M.R. (2021) The Role of Functional Efficiency in the Decline of North America's Copper Culture (8000–3000 BP): an Experimental, Ecological, and Evolutionary Approach. *J Archaeological Method and Theory* 28**:** 1224–1260.

Beeman, T. W. (1892) *Annual Archaeology Report 1891.* Minister of Education. 15-6.

Benjamin, W. (1999) On the Mimetic Faculty, in *Selected Writings, 1926-1934.* Eds. Michael Jennings, Howard Eiland, and Gary Smith. Cambridge, MA: Belknap Press.

Benjamin, W & Tarnowski, K. (1979) Doctrine of the Similar (1993). *New German Critique,* (17) 65-69.

Bergson, H. (2004 [1896]) *Matter and Memory,* trans. N.M. Hall N.M. and Palmer W.S. Dover Philosophical Classics.

Bergson, H. (1910) *Time and Free Will: An Essay on the immediate Data of Consciousness,* tr. F.L. Pogson, Montana: Kessinger Publishing Company.

Betasamosake Simpson, L.B. (2008) Looking after *Gdoo-naaganinaa*: Precolonial Nishnaabeg Diplomatic and Treaty Relationships, in *Wicazo Sa Review, 23*(2): 29-42.

Betasamosake Simpson, L. (2011) *Dancing on our Turtle's Back: Stories of Nishnaabeg Re-Creation, Resurgence, and a New Emergence*. Arbeiter Ring Publishing

Betasamosake Simpson, L. (2014) Land as pedagogy: Nishnaabeg intelligence and rebellious transformation. *Decolonization: Indigeneity, Education & Society 3:*3.

Biggar, H.P. (1901 / 1965) *The Early Trading Companies of New France: A Contribution to the History of Commerce and Discovery in North America.* New York: Argonaut Press.

Biggar, H.P. (ed.) (1925a) *The Works of Samuel de Champlain,* Vol II. Toronto: The Champlain Society.

Biggar, H.P. (ed.) (1925b) *The Works of Samuel de Champlain,* Vol III. Toronto: The Champlain Society.

Billet, S. (2016) Apprenticeship as Mode of Learning and Model of Education. *Education and Training. 58*(6): 613-628.

Binford, L.R., (1962) Archaeology as Anthropology. *American Antiquity, 28*, 2: 217-225.

Blackstock, C. (2015/16) Social Movements and the Law: Addressing Engrained Government-Based Racial Discrimination Against Indigenous Children. *Australian Indigenous Law Review* vol. 19 (1).

Bloch, M. (1996) Internal and External Memory: Different Ways of Being in History. In P. Antze and M. Lambek. (eds.) *Tense Past: Cultural Essays in Trauma and Memory.* 215-33. London: Routledge

Blumenberg, H. (1993) Light as a Metaphor for Truth: At the Preliminary Stage of Philosophical Concept Formation. In *Modernity and the Hegemony of Vision,* ed. D. M. Levin. University of California Press, Berkeley.

Bourne, E. G. (ed.) (1904) *The Voyages and Explorations of Samuel de Champlain 1604-1616*, Vol. I. New York: Allerton Book Co.

British Parliament [Reprint 1803], *Reports from Committees of the House of Commons*. Vol. II. Miscellaneous Subjects: 1738-1765, Appendix XIX, p. 257. "Report from the Committee appointed to enquire into the State and Condition of the Countries adjoining Hudson's Bay, and of the Trade carried on there." [originally printed in 1749]

Broadbent, D.E. (1958) *Perception and communication.* New York, NY: Pergamon Press.

Brooks, R. (1991). Intelligence without representation. *Artificial Intelligence Journal,* 47, 139-160.

Bull, M., Gilroy, P., Howes, D., & Kahn, D. (2006) *The Senses and Society*. Oxford: Berg Publishers.

Burton, J. (2008) Bergson's non-archival theory of memory. *Memory Studies 1* (3): 321-339.

Bushnell, E.W. & Baxt, C. (1999) Children's haptic and cross-modal recognition with familiar and unfamiliar objects. *Journal of Experimental Psychology: Human Perception and Performance, 25*: 1867-1881.

Canada. (1996) Report of the Royal Commission on Aboriginal Peoples vol. 2. *Restructuring the Relationship - Barriere Lake Trilateral Agreement, Quebec.* [Ottawa, ON] 1996.

Cartier, J. (2004 / 1545) Voyage de J. Cartier au Canada. La Bibliothèque Nationale de Québec, Project Gutenberg ebook, [accessed from] https://www.gutenberg.org/files/12356/12356-h/12356-h.htm

Casey, E. S. (1987) *Remembering: A Phenomenological Study.* Bloomington: Indiana University Press.

Chapman, O. & Sawchuk, K. (2012) Research-Creation: Intervention, Analysis and "Family Resemblances". *Canadian Journal of Communication* vol. 37.

Chase, P. G. (2008) Form, Function and Mental Templates in Paleolithic Lithic Analysis. Paper presented at the symposium *From the Pecos to the Paleolithic,* American Anthropology Meetings, Vancouver, BC 28 March 2008.

Chemero (2011) *Radical Embodied Cognition Science*, Cambridge, MA: MIT Press.

Clark, A. (1997) *Being There: Putting Brain, Body and World Together Again.* Cambridge, MA: MIT Press.

Clark, A. (1999). *Microcognition: Philosophy, Cognitive Science, and Parallel Distributed Processing.* Cambridge, MA: MIT Press.

Clark, A. (2005) Beyond the flesh: some lessons from a mole cricket. Artif. Life 11 (1-2), 233-244.

Clark, A. (2008). *Supersizing the Mind: Embodiment, Action, and Cognitive Extension.* New York: Oxford University Press.

Clark, A. (2010a) Material Surrogacy and the Supernatural: Reflections on the Role of Artefacts in 'Of-line' Cognition. In *The Cognitive Life of Things* ed. L. Malafouris and C. Renfrew. Cambridge: MacDonald Institute for Archaeological Research. 23-27.

Clark, A. (2010b) Memento's Revenge: The extended mind, extended. In R. Menary (ed.) *The Extended mind,* 43-66.

Clark, A. & Chalmers, D. (1998) The extended mind. *Analysis* 58(1): 7-19.

Classen, C. (1993) *World of Sense: Exploring the senses in history and across cultures.* London: Routledge.

Classen, C. (1997) Foundations for an Anthropology of the Senses. *International Social Science Journal* 153: 402-423.

Colson, A. (2007) What do these Symbols Mean? A Critical Review of the Images Found on the Rocks of the Canadian Shield with Specific Reference to the Pictographs of the Lake of the Woods. *Pan American Institute of Geography and History*, 25: 101-185.

Commanda, W. (2009) "Reflections in Correspondence to the Governor General and the Queen Regarding His Appointment to Officer of The Order of Canada and His Work" published at http://www.circleofallnations.ca

Commanda, W. (2010) “A Report on the Vision for the Asinabka National Indigenous Centre” A Circle of All Nations Report. [downloaded from] https://app06.ottawa.ca/calendar/ottawa/citycouncil/occ/2010/11-19/cpsc/02-%20report%20on%20the%20vision%20for%20the%20Askiabka.htm

Commanda, C., McDermott, L. & Nelson, S. (2019) (in press) “*Ginawaydaganuc*: Algonquin teachings of the birch bark canoe” in B. Erickson & S. Krotz (eds), *The Politics of the Canoe: Activism and Resistance through the Canoe.* University of Manitoba Press.

Connellier, (2011) *An Archaeology of Materials: substantial Transformations in Early Prehistoric Europe.* New York: Routledge.

Connerton, P. (1989) *How Societies Remember*. Cambridge University Press.

Connor, C. & Johnson, K. (1992) Neural Coding of Tactile Texture: Comparison of Spatial and Temporal Mechanisms for Roughness Perception. *The Journal of Neuroscience,* 12(9): 3414-3426.

Conway, T. (1985) *Ojibway Rock Art and Vision Quest Sites.* (Manuscript) Ontario Ministry of Citizenship and Culture, Toronto.

Conway, T. (1993) *Painted Dreams.* Minocqua, Wisconsin: Northwood Press.

Corbin, A. (1986) *The Foul and the Fragrant: odour and the French social imagination.* Cambridge, MA: Harvard University Press.

Cox, R., Irving, A., & Wright, C. (2014) *Beyond Text ‘unpublished manuscript’* Manchester, U.K.

Coy, M. W. (1989) *Apprenticeship: from Theory to Method and Back Again*. Albany, NY: Suny Press.

Coulthard, G. S. & Betasomosoke Simpson, L. (2016) Grounded Normativity / Place-Based Solidarity. *American Quarterly 68* (2): 249-55.

Croft, S. & Mathewes R.W. (2013) Barking up the Right Tree: Understanding Birch Bark Artifacts from the Canadian Plateau. *British Columbia. B.C. Studies*, no. 180.

Cuoq, J. A. (1893) “Anotc Kekon” Mémoires de la Société Royale du Canada.

Dams, L. (1984) Preliminary findings at the ‘Organ’ Sanctuary in the cave of Nerja, Malaga, Spain, *Oxford Journal of Archaeology 3*: 1-14.

Danzinger, K. (2008) *Making the Mind: A History of Memory.* Cambridge University Press.

Darnell, R. (1989) Correlates of Cree Narrative Performance. In R. Bauman & J. Sherzer (Eds.), *Explorations in the Ethnography of Speaking*, Studies in the Social and Cultural Foundations of Language: 315-336. Cambridge: Cambridge University Press.

Day, G. (1981) *Identity of the St Francis Indians*, Canadian Ethnology Service Paper no. 71 Mercury Series. Ottawa: National Museum of Canada.

Day, J. (2013) ed. *Making Senses of the Past: Towards a sensory archaeology.* Southern Illinois University Press: Carbondale.

Day, M. (2004) Religion, off-line cognition, and the extended mind. *Journal of Cognition and Culture*. 4(1), 101-21.

De Beaune, S. A. (2000) *Pour une archéologie de geste. Broyer, moudre, piler, des premiers chasseurs aux premiers agriculture.* Paris: CNRS Éditions.

De Beaune, S. A. (2004) The Invention of Technology: Prehistory and cognition. *Current Anthropology,* 45: 139-162.

De Beaune, S. A. (2008) *L'homme et l'outil. L'invention technique Durant la préhisotoire.* Paris: CNRS Éditions.

De Beaune, S. A. (2009) Technical invention in the Palaeolithic: What if the explanation comes from the cognitive and neuropsychological sciences? In eds Sophie de Beaune, Frederick Coolidge & Thomas Wynn *Cognitive Archaeology and Human Evolution.* New York: Cambridge University Press: 3-14.

De Brigard, F. (2014a) The Nature of Memory Traces. *Philosophy Compass 9*(6): 402-414.

De Brigard, F. (2014b) Is memory for remembering? Recollection as a form of episodic hypothetical thinking. *Synthese* 191 (2): 155-185.

Descartes, R. (1662 / 1972) *Rene Descartes: Treatise of Man.* trans. T.S. Hall Cambridge, MA: Harvard University Press.

Deetz, J. (1967) *Invitation to Archaeology.* American Museum Science Books. Natural History Press, Garden City, NJ.

Deleuze, G. (1993) *The fold: Leibniz and the baroque*. Minneapolis: University of Minnesota Press.

Derrick, T.J. (2017) Sensory Archaeologies: A Vindolanda smellscape. In E. Betts (ed.) *Senses of the Empire: Multisensory Approaches to Roman Culture.* London: Routledge.

Descola, P. (2014) All too human (still) A comment on Eduardo Kohn's How forests think. *HAU: Journal of Ethnographic Theory* 4 (2): 267-273.

Désveau, E. (1988) *Sous le Signe de l'Ours. Mythes et Temporalité chez les Ojibwa Septentronaux. Editions de la Maison de Sciences de l'Homme, Paris.*

Devereux, P. (2001) *Stone Age soundtracks: the acoustic archaeology of ancient sites.* London: Vega Books

Dewdney, S. (1960-66) *Selwyn Dewdney Collection.* The New World Archaeology Department, Royal Ontario Museum, Toronto, Canada.

Dewdney, S. (1970) Dating Rock Art in the Canadian Shield Region, *Royal Ontario Museum*, University of Toronto Press: Toronto, Canada.

Dewdney, S. (1978) Aboriginal rock paintings in Manitoba: A preliminary description of 27 sites east and northeast of Lake Winnipeg. In *Papers in Manitoba archaeology (Part II: Rock Art)* Winnipeg: Historic Resources Branch, Manitoba Department of Tourism, Recreation and Cultural Affairs: 105-134.

Dibble, H. L. 1987 The Interpretation of Middle Paleolithic Scraper Morphology. *American Antiquity* 52(1): 109-117.

Dickason, O. P. (1984) *The Myth of the Savage: and the Beginnings of French Colonialism in the Americas*. Edmonton: University of Alberta Press.

Dill, M. & Fahle, M. (1997) The role of visual field position in pattern discrimination learning. *Proc R Soc Lond B Biol Sci* 264: 1031-1036.

Dill, M. & Fahle, M. (1998) Limited translation invariance of human visual pattern recognition. *Percept Psychophys* 60: 65-81.

Dreyfus, H.L. & Dreyfus S.E. (1986) *Mind Over Machine: The Power of Human Intuition and Expertise in the Era of the Computer.* New York: Free Press.

Dreyfus, H.L. (1991) *Being-in-the-World: A Commentary on Heidegger's Being and Time.* Cambridge, MA: MIT Press.

Dreyfus, H.L. (2002) Intelligence Without Representation – Merleau Ponty's Critique of Mental Representation. *Phenomenology and the Cognitive Sciences.* 1: 367-383.

Dreyfus, H.L. (2004) The Five-Stage Model of Adult Skill Acquisition. *Bulletin of Science, Technology & Society. 24* (3): 177-181.

Fabian, J. (1983) *Time and the Other: how anthropology makes its object.* New York: Columbia University Press.

Fazenda et al. (2017) Cave acoustics in prehistory: Exploring the association of Palaeolithic visual motifs and acoustic response. *The Journal of the Acoustical Society of America* (142): 1332-1349.

Feld, S. (1982) *Sound and Sentiment: Birds, weeping, poetics, and song in Kaluli expression.* (first edition) Philadelphia, PA: University of Pennsylvania Press.

Feld, S. (1990) *Sound and Sentiment: Birds, weeping, poetics, and song in Kaluli expression.* (second edition) Philadelphia, PA: University of Pennsylvania Press.

Feld, S. (1994) From Ethnomusicology to Echo-Muse-Ecology: Reading R. Murray Schafer in the Papua New Guinea Rainforest. *Soundscapes Newsletter, World Forum for Acoustic Ecology,* no. 8: 6-8.

Feld, S. (1996) "Waterfalls and song: an acoustemology of place resounding in Bosavi, Papua New Guinea" in S. Feld and K.H. Basso (eds), *Senses of place,* 91-135. Santa Fe, New Mexico: School of American Research Press.

Feld, S. (2005) Places sensed, senses placed: towards a sensuous epistemology of environments. In D. Howes (ed.) *Empire of the senses: the sensual culture reader, 179-91.* Oxford: Berg.

Feld, S. (2015) Acoustemology, in D. Nowak and M. Sakakeeny (eds.), *Keywords in sound,* 12-21. Durham, NC: Duke University Press.

Feld, S., & Brenneis, D. (2004) AE Interview - Doing Anthropology in Sound. *American Ethnologist, 31*(4), 461.

Folkerth, W. (2003) *The sound of Shakespeare.* London: Routledge.

Foster, M. K. (2013) Another look at the function of wampum in Iroquois-white councils. In B. Neumann, & H. Leira (eds.), *International diplomacy* Vol. 4: 99-114.

Fournier, S. & Ernie, C. (1997) *Stolen from our embrace: The Abduction of First Nations Children and the Restoration of Aboriginal Communities.* Douglas & McIntyre Ltd.

Froese, T. & Di Paolo E.A. (2011) The enactive approach: Theoretical sketches from cell to society. *Pragmatics & Cognition* 19(1): 1-36.

Gadelha, M. J. N., da Silva, J. A., de Andrade, M. J. O., Viana, D. N. M., Calvo, B.F., & Santos, N. A. (2013) Haptic Memory and Forgetting: a systematic review. *Estudos de Psicologia, 18*(1): 131-136.

Gallagher, S. (2005) *How the Body Shapes the Mind* New York: Oxford University Press.

Gallagher, S. (2007) The natural philosophy of agency. *Philosophy Compass.* 2 (2): 347-357.

Galton, F. (1883) *Inquiries into human faculty and its development.* London: Macmillan.

Gapp, K. et. al. (2014) Implication of sperm RNAs in Transgenerational inheritance of the effects of early trauma in mice. *Nat Neurosci 17,* 5 667-9

Gebauer, G. & Wulf C. (1995) *Mimesis: Culture, Art, Society,* translated by Don Reneau. Berkley: University of California Press.

Gehl, L. (2017) *Claiming Anishinaabe.* Regina: University of Regina Press.

Gell, A. (1995) "Language of the Forest: Landscape and Phonological Iconism" In E. Hirsch & M. O'Hanlon (eds.) *The Anthropology of Landscape: Perspectives on Place and Space*. Oxford University Press, 232-254.

Gell, A. (1998) *Art and Agency: An Anthropological Theory.* Oxford University Press.

Geloso, V. (2019) Distinct within North America: living standards in French Canada, 1688-1775. *Cliometrica 13:* 277-321.

Geloso, V., Kufenko, V. & Villeneuve, R. (2016) Living Standards in Lower Canada, 1831. Schriftenriehe de Promotionsschewerpunkts Globalisierung und Beschäftingung, No. 50/2016, Universität Hohenheim, Stuttgart.

Gerrans, P. & Kennett, J. (2010) Neurosentimentalism and moral agency. *Mind* 119 (475): 585-614.

Geurts, K.L. (2003) *Culture and the Senses: Bodily Ways of Knowing in an African Community.* Berkley: University of California Press.

Gheorghiu, D. (2009) *Artchaeology: A sensorial approach to the materiality of the past*. UNArte: Bucharest.

Gibson, J. (1966) *The Senses Considered as Perceptual Systems.* Boston: Houghton-Mifflin.

Gibson, J. J. (1977) The theory of affordances. In *Perceiving, Acting, and Knowing,* ed. R.E. Shaw and J. Bransford. Erlbaum.

Gibson, J. (1979) *The Ecological Approach to Visual Perception.* Boston: Houghton-Mifflin.

Girard, C. & Brisson, C. (2014) *Nistassinan-Notre Terre: Alliance et Souveraineté Partagée du Peuple Innu au Québec – Des premiers contact a nos jours*. Québec: Les Presses de L'Université Laval.

Girard, C. & Perron, N. (1995) *Histoire du Saguenay-Lac-Saint-Jean. Québec*: Les Presses de l'Université de Laval et Institut national de la recherche scientifique (INRS-Culture et Société).

Glenberg, A.M. (1997) What memory is for. *Behavioural & Brain Sciences,* 20, 1-55.

Godelier, M. & Thom, M. (1986) *The mental and the material: thought, economy and society.* Verso London.

Gordon, B. (2008) Dating Pictographs and Petroglyphs with AMS Carbon-Dated Charcoal, Bone and Plant Specks Associated with Fallen Pigment Dust, Droplets or Rock Fragments: A Non-Destructive Field Technique Using High Resolution Photofiltering of 20x50 cm Rectangular Soil Peels Below the Rock Art. (Conference Papers) World Archaeological Congress. accessed on March 15, 2019 from https://carleton.ca/rangifercentral/?p=913

Gosden, C. (2001) Making Sense: Archaeology and aesthetics. *World Archaeology* 33 (2): 163-167.

Gowlett, J. A. J. (1986) Culture and conceptualisation: The Oldowan-Acheulian gradient. In *Stone Age Prehistory,* ed. G. N. Bailey and P. Callow. Pp. 243-260. Cambridge: Cambridge University Press.

Graham, G. & Stephens, G. L. (1994) Mind and mine. In *Philosophical Psychopathology.* ed. G. Graham and G. L. Stephens. Cambridge, MA: MIT Press.

Gross, R. (2005) *Psychology: The Science of Mind and Behaviour.* London: Hodder Arnold.

Guerelac, S. (2006) *Thinking in Time: An introduction to Henri Bergson.* Ithaca, N.Y.: Cornell University Press

Hakluyt, R. (1582) *Divers Voyages, Touching the Discovery of America and the Islands Adjacent,* Reprint. J. W. Jones (ed.) (1850) Hakluyt Society, London: 1850.

Hallowell, A. I. (1975) Ojibwa Ontology, Behaviour, and World View. In *Teachings from the American Earth. Indian Religion and Philosophy*, (ed.) D. Tedlock and B. Tedlock. Liveright, New York: 141-178.

Hamilakis, Y. (2013) *Archaeology and the senses: Human experience, memory, and affect.* New York, NY: Cambridge University Press.

Hansen, M. (2011) *Cinema and Experience: Siegfried Kracauer, Walter Benjamin and Theodor W. Adorno.* University of California Press.

Harris, J., Harris, I. & Diamond, M. (2001) The Topography of Tactile Working Memory. *The Journal of Neuroscience, 21*(20): 8262-8269.

Hastorf, C. (2016) *The Social Archaeology of Food: Thinking about eating from prehistory to the present.* Cambridge: Cambridge University Press.

Hayman, C.A.G. & Tulving, E. (1989) Is priming in fragment completion bason on a 'traceless' memory system? *Journal of Experimental Psychology: Learning, Memory, and Cognition,* 14: 941-56.

Head, H. (1920) *Studies in Neurology.* London, UK: Hodder & Stoughton.

Hebb, D. (1949) *The Organization of Behaviour: A Neuropsychological Theory.* New York, NY: John Wiley & Sons Inc.

Henderson, J. A. & Wakenham, P. (2009). Colonial reckoning, National reconciliation?: Aboriginal Peoples and the Culture of Redress in Canada. *ESC: English Studies in Canada, 35*(1): 1-26.

Henry, A. (1901) *Travels and Adventures in Canada and the Indian Territories between the Years 1760 and 1776,* (Reprint) Edmonton, M.G. Hurtig.

Herrnstein, R.J. & Boring, E.G. (1965) *A Source Book in the History of Psychology.* Cambridge, MA: Harvard University Press.

Hoffman, J. (2014) Q&A: Acoustic Archaeologist. *Nature* 506: 158.

Holmes, L. (2000) Heart knowledge, blood memory and the voice of the land: Implications of research among Hawaiian Elders. In G. Dei, B. Hall & D. Rosenberg (Eds.), *Indigenous knowledges in global contexts: Multiple readings of our world*. Toronto, ON: University of Toronto Press: 37-53.

Howes, D. (1991) Introduction: To Summon All the Senses. In (ed. D. Howes) *The Varieties of Sensory Experience: A sourcebook in the anthropology of the Senses.* (pp. 3-21). Toronto: University of Toronto Press.

Howes, D. (2003) *Sensual relations: engaging the sense in culture and social theory.* Ann Arbor: University of Michigan Press.

Howes, D. (2009) *The Sixth Sense Reader.* Berg: Oxford.

Howes, D. (2013) "The Expanding Field of Sensory Studies" (An Essay) Montreal: Center for Sensory Studies.

Howes, D. (2017) "Digging up the sensorium" conference lecture unpublished manuscript.

Howes, D. (2019) Multisensory Anthropology. *Annual Review of Anthropology 48:* 17-28.

Howes, D. & Classen, C. (2014) *Ways of Sensing: Understanding the Senses in Society.* London: Routledge.

Howes, D. & Classen, C. (2019) Sounding Sensory Profiles in Eds. A Schellenberg & T Krüger Sounding Sensory Profiles in the Ancient Near East, Atlanta, GA: Society of Biblical Literature Press 3-42.

Huang, H. (2006) Blood/Memory in N. Scott Momaday's *The Names: A Memoir* and Linda Hogan's *The Woman Who Watches over the World: A Native Memoir. Concentric: Literary and Cultural Studies 32,* 1: 171-95.

Hughes, H.C. (2001) *Sensory Exotica: A World beyond Human Experience*. Cambridge, MA: MIT Press.

Huitema, M. (undated) "Historical Algonquin Occupancy Algonquin Park" Report Prepared for Elders Without Borders.

Hutchins, E. (1995) *Cognition in the wild.* Cambridge, MA: MIT Press.

Hutchins, E. & Klausen (1994) Distributed Cognition in an Airline Cockpit. In Middleton, D. & Engström, Y. (eds.) *Communication and Cognition at Work.*

Hutto D. D. & Myin, E. (2013) *Radicalizing enactivism.* Cambridge, MA: MIT Press.

Hutto D.D. & Myin, E. (2017) *Evolving Enactivism: Basic minds meet content*. Cambridge, MA: MIT Press.

Hutto, D. D. & Peeters, A. (2018) The Roots of Remembering: Radical Enactive Recollecting. Ed. K. Michaelian, et al. *New Directions in the Philosophy of Memory,* Routledge: 97-118.

I.N.A.C. (Indigenous and Northern Affairs Canada). *Algonquins of Barriere Lake – Chronology 2009.* Accessed Nov 20, 2018. https://www.aadnc-aandc.gc.ca/eng/1100100016352/1100100016353#a3

I.N.A.C. (Indigenous and Northern Affairs Canada). *Algonquins of Barriere Lake – The 1991 Trilateral Agreement.* Accessed Nov 20, 2018. https://www.aadnc-aandc.gc.ca/eng/1100100016352/1100100016353#a3

Ingold, T. (2000) *Perception of the Environment*: essays on livelihood, dwelling & skill. Routledge.

Ingold, T. (2007) *Being Alive: Essays on Movement, Knowledge and description.* London: Routledge.

Ingold, T. (2008) When ANT meets SPIDER: Social theory for arthropods. In *Material Agency: Towards a Non-Anthropocentric Approach.* ed. C. Knappett, and L. Malafouris. Springer Science + Business Media.

Ingold, T. (2011) *Being Alive: Essays on movement, knowledge and description.* Routledge.

Jackson, M. (1989) *Paths Towards a Clearing: Radical Empiricism and Ethnographic Inquiry.* Bloomington and Indianapolis: Indiana University Press.

James, W. (1890) *The principles of psychology, Vol. 1 & 2* New York: Henry Holt and Co.

Jay, M. (1993) Downcast Eyes: The Denigration of Vision in Twentieth-Century French Thought.

Jenness, D. (1935) *The Ojibwa Indians of Parry Island, Their Social and Religious Life.* J.O. Patenaude, Ottawa.

Johnston, P. (1983) *Native Children and the Welfare System*. Toronto, ON: Canadian Council on Social Development and James Lorimer & Co.

Jones, A. (2007) *Memory and Material Culture.* Cambridge, MA: Cambridge University Press.

Jones, T. (1981) The Aboriginal Rock Paintings of the Churchill River. Saskatchewan Museum of Natural History. *Anthropological Series no. 4: Regina.*

Kellogg, L. P. (2002) Early Narratives of the Northwest 1634-1699.

Kelman, A. Y. (2015) Rethinking the Soundscape, *The Senses and Society,* 5:2, 212-234.

Kent, T. (1997) Birchbark Canoes of the Furtrade. Ossineke, Michigan: Silver Fox Enterprises

Kirsh, D. & Maglio, P. (1994) *On distinguishing epistemic from pragmatic action.* Cognitive Science, 18, 513-549.

Klatzky R. L., Lederman, S. J., & Metzger, V. (1985) Identifying objects by touch: An 'expert system' *Perception & Psychophysics, 37*: 299-302.

Knappett, C. (2002) Photographs, skeyomorphs and marionettes: Some thoughts on mind, agency and object. *Journal of Material Culture* 7 (1): 97-117.

Knappett, C. & Malafouris, L. (2008) *Material Agency: Towards a Non-Anthropocentric Approach*. Springer Science + Business Media.

Kolar, M. (2018) Archaeoacoustics: Re-Sounding Material Culture. *Acoustical Society of America 14*: 4, 28-37.

Kolers, P.A. & Roediger, H.L. (1984) Procedures of mind. *Journal of Verbal Learning & Verbal behavior, 23*(4): 425-449.

Krupat, (1989) *The Voice in the Margin: Native American Literature and the Canon*. Berkeley and Los Angeles: University of California Press.

Lacey, S. & Campbell, C. (2006) Mental representation in visual/haptic cross modal memory: evidence from interference effects. *The Quarterly Journal of Experimental Psychology, 59*: 361-376.

Lachance, L. (2018) The Embodied Politics of Relational Indigenous Dramaturgies (Doctoral dissertation, University of British Columbia, Vancouver, Canada). Available from: https://open.library.ubc.ca/cIRcle/collections/ubctheses/24/items/1.0363947

Latour, B. (1991) We Have Never Been Modern. Cambridge, Massachusetts: Harvard University Press.

Latour, B. (1999) *Pandoras Hope: Essays on the Reality of Science Studies.* Harvard University Press.

Law, J. (1992) Notes on the Theory of the Actor Network: Ordering, Strategy and Heterogeneity.

Lemaître, S. (1997) Du Plus Loin au Plus Proches : Notes Pour une Meilleure Observation de l'Art Rupestre Canadien. *Annales d'Histoire de l'Art et Archaeologie de l' U.L.B., XiX : 47-69.*

Lemmonnier, P. (1993) Technological Choices: Transformation in Material Cultures since the Neolithic. London: Routledge.

Leroi-Gourhan (1993) *Gesture and Speech.* Trans. A Bostock Berger, Cambridge, MA: MIT Press.

Levin, D. M. (1997) *Modernity and the Hegemony of Vision.*

l'Incarnation, M. (1967) *Word from New France, the selected letters of Marie de L'Incarnation.* ed. & trans. Joyce Marshall. Oxford University Press: Toronto.

Loader, D. S. (2013) Is my memory an extended notebook? *Review of Philosophy and Psychology,* 4, 167-184.

Lowenthal, D. (1985) *The Past is a Foreign Country.* Cambridge University Press.

Lozier, J-F. (2018) *Flesh Reborn: The Saint Lawrence Valley Mission Settlements through the Seventeenth Century*. Montreal & Kingston: McGill-Queen's University Press.

Lubman, D. (1998) Archaeological acoustic study of chirped echo from the mayan pyramid at chichén itzá. *The Journal of the Acoustical Society of America, 104*(3), 1763-1763.

Lund, C. (1981) The archaeomusicology of Scandinavia. *World Archaeology 12:* 246-65.

Lyons, W. (2001) *Matters of the Mind.* New York, Routledge.

MacGregor, G. (1999) Making sense of the past in the present: a sensory analysis of carved stone balls. *World Archaeology* 31: 258-271.

Malafouris, L. (2004) The cognitive basis of material engagement: Where brain, body and culture conflate. In E. DesMarrais, C. Gosden, & C. Renfrew (Eds.), *Rethinking materiality: The engagement of mind with the material world* (pp. 53-62). Cambridge: The McDonald Institute for Archaeological Research.

Malafouris, L. (2008) At the Potter's Wheel: An Argument *for* Material Agency. In *Material Agency: Towards a Non-Anthropocentric Approach.* ed. C. Knappett, and L. Malafouris. Springer Science + Business Media.

Malafouris, L. (2010) Knapping Intentions and the Marks of the Mental. In *The Cogntive Life of Things* ed. L. Malafouris and C. Renfrew. Cambridge: MacDonald Institute for Archaeological Research. 13-22.

Malafouris, L. (2013) *How Things Shape the Mind: A Theory of Material Engagement.* MIT Press.

Malafouris, L. (2014) Creative Thinging: the feeling of and for clay, *Pragmatics and Cognition,* 22(1): 140-58.

Malafouris, L. (2015) Metaplasticity and the primacy of material engagement, *Time and Mind*, 8(4): 351-71.

Malafouris, L. (2019a) Thinking as "Thinging": Psychology With Things. *Association for Psychological Science,* 29(1), 4-8.

Malafouris, L. (2019b) Mind and Material Engagement. *Phenomenology and the Cognitive Sciences 18,* 1-17.

Malafouris, L. (2020) How does thinking relate to tool making? *Adaptive Behaviour* (09): 1-15

Malafouris, L. & Koukouti, M. D. (2018) How the body remembers its skills: Memory and material engagement. *Journal of Consciousness Studies,* 25, 158-180.

March, P.L. & Glavneau, V. (2020) Craft in *Encyclopedia of Creativity* (3rd edition) S. Pritzker & M.Runco (eds.) Boston, MA: Elsevier: 215-21.

Manore, J. (2008) "Contested Terrains of Space and Place: Hunting and the Landscape known as Algonquin Park, 1890-1950" in *The Culture of Hunting in Canada*, eds. Jean Manore and Dale Miner, Vancouver: UBC Press.

Marchand, T. (2008) Muscles, Moral and Mind: Craft Apprenticeship and the Formation of Person, *British Journal of Educational Studies*, 56:3

Marchand, T. (2010) Making Knowledge: Explorations of the Indissoluble Relations Between Mind, Body and Environment. *The Journal of the Royal Anthropological Institute, 16,* 2.

Martin, K. (1976) "Bone Flutes and Whistles from Archaeological Sites in Eastern North America" (Masters Thesis) University of Tennessee, Knoxville, USA.

Martin, K. & Garrett, J. (2010) Teaching and Learning with Traditional Indigenous Knowledge in the Tall Grass Plains. *The Canadian Journal of Native Studies,* XXX, 2.

Martinovic, J., Lawson, R. & Craddock, M. (2012) Time course of Information processing in visual and haptic object classification. *Frontiers in Human Neuroscience, 6:* 1-11.

Mason, O. T. (1899) The Man's Knife Among the North American Indians: A study in the collections of the U.S. National Museum. Smithsonian Institution. Washington: Government Printing Office.

Mazzarella, W. (2017) *The Mana of Mass Society*. University of Chicago Press

McGhee, R. (1976) *The Burial at l'Anse-Amour,* Ottawa: National Museum of Man.

McGrath, L.S. (2020) *Making Spirit Matter: Neurology, Psychology and Selfhood in Modern France.* Chicago: University of Chicago Press.

McLuhan, M. (1962) The Gutenberg Galaxy: The Making of typographical man. University of Toronto Press.

McNabb, J., Binyon, F. & Hazelwood, L. (2004) The Large Cutting Tools from the South African Acheulean and the Question of Social Traditions. *Current Anthropology* 45(5): 653-657.

Mellars, P. (1989) Technological changes at the Middle-Upper Palaeolithic transition: Economic, social and cognitive perspectives. In *The Human Revolution,* ed. P. Mellars and C. B. Stringer pp. 338-365. Edinburgh, Edinburgh University Press.

Merleau-Ponty, M. (1962) *Phenomenology of Perception.* Translated by C. Smith. London: Routledge.

Michaelian, K. (2011) Is memory a natural kind? *Memory Studies* 4(2): 170-189.

Michaelian, K. (2016) *Mental Time Travel: Episodic Memory and Our Knowledge of the Personal Past.* MIT Press.

Mills, S. (2010) "The Contribution of Sound to Archaeology" *Teleorman County Museum Bulletin,* issue 2: 179-195.

Mills, S. (2014) *Auditory Archaeology: Understanding sound and hearing in the past*. Walnut Creek, CA: Left Coast Press.

Mithen, S. (2000) Mind, Brain and Material Culture: An archaeological Perspective. *Evolution and the Human Mind: Modularity, Language and Metacognition.* P. Carruthers and A. Chaberlain. Cambridge, Cambridge University Press: 207-217.

Miyagawa, S., Lesure, C., & Nóbrega, V. (2018). Cross-modality information transfer: A hypothesis about the relationship among prehistoric cave paintings, symbolic thinking, and the emergence of language. *Frontiers in Psychology, 9*.

Mojica, M. (2011) Stories from the Body: Blood Memory and Organic Texts*.* In *Native American Performance and Representation.* Ed. S.E. Wilmer. Tucson: University of Arizona Press: 97-109.

Mojica, M. (2012) In Plain Sight: Inscripted Earth and Invisible Realities. In *New Canadian Realisms,* eds. Roberta Barket and Kim Solga. 218-242.

Momaday, N.S. (1968) *House made of Dawn*. New York: Harper & Row

Momaday, N.S. (1987) "Personal Reflections" in *The American Indian and the Problem of History.* C. Martin (ed.) New York: Oxford University Press.

Moreira, M. I., Cabecinhas, R., & Macedo, L. (2013) (Post)-conflict Memories and Identity Narrative in the Documentary Series I Am Africa. *Observatorio (OBS) Journal.* 7: 115-128.

Morley, I. (2006) Mousterial Musicianship? The case of the Divje Babe I Bone. *Oxford Journal of Archaeology, 25*(4), 317-333.

Mowbray, M. (2009) "Mimetic Faculty" in *The Sixth Sense ABCDerium* (ed.) David Howes. https://sixthsensereader.org/about-the-book/abcderium-index/mimetic-faculty/ (accessed 01. 15. 2019).

Myers, G. (1914) *A History of Canadian Wealth vol. 1.* Charles H. Kerr & Company: Chicago.

Nabeta, T. & Kawahara, J. (2006) Congruency effect of presentation modality on haptic and visual false memory of real objects. *Memory, 14:* 307-315.

N.A.C. (National Archives of Canada), RG10, V 2401, File 83-203, Chief Peter Charbot letter to E. Bennett, Indian Agent, Castile, Ontario, 1896/02/22.

N.A.C. (National Archives of Canada), RG10, V 2401, File 83-203, Aubrey White, Assistant Commissioner of Crown Lands to Hayter Reed, Deputy Superintendent General of Indian Affairs 1895/11/16: 108230:1-3

National Inquiry into Missing and Murdered Indigenous Women and Girls: Truth-Gathering Process. Parts 2 & 3 Volume 3 accessed from [https://www.mmiwg-ffada.ca/wp-content/uploads/2019/04/20180912_MMIWG_Iqaluit_Colonial_Parts_2__3_Vol_3.pdf]

Niesser. U. (1996) Remembering as doing. *Behavioral and Brain Sciences* 19: 203-204.

Noë, A. (2004) *Action in Perception*. Cambridge MA: MIT Press.

Noë, A. (2009) *Out of our Heads: Why You Are Not Your Brain, and Other Lessons from the Biology of Consciousness.* New York, NY: Hill and Wang.

Norder, J. (2003) *Marking Place and Creating Space in Northern Algonquin Landscapes: the Rock-art of the Lake of the Woods Region, Ontario*. (Ph.D. dissertation), University of Michigan: Ann Arbor, MI.

Norder, J. (2018) Listen for the Echo of Drums Across the Water: Rock Art Sites as Engaged Community Research in Ontario, Canada. In Steven W. Silliman ed. Engaging Archaeology: 25 Case Studies in Research Practice. Hoboken, NJ: Willey, 71-78.

Norder, J. & Carroll, J. (2011) Rock Art in the Lake of the Woods Region of Ontario: An Applied Geospatial Approach. *International Journal of Applied Geospatial Research,* 2: 77-92.

Nowell, A., Park, K., Metaxis, D. & Park, J. (2003) Deformation modeling: A methodology for the analysis of handaxe morphology and variability. In *Multiple Approaches to the Study of*

Bifaceial Technologies. ed. M. Soressi and H. L. Dibble. Philadelphia: University of Pennsylvania Museum of Archaeology and Anthropology.

Ordinance respecting the Indian Trade, 13 April 1764. Canada Parliament, House of Commons Sessional papers, Vol. LIX, No. 9 Sessional Paper No. 29a: 196-197.

O'Regan, J. K. (1992) Solving the "real" mysteries of visual perception: The world as an outside memory. *Canadian Journal of Psychology, 46,* 461-488.

Ormiston, N. T. (2010) Re-Conceptualizing Research: A Indigenous Perspective. *First Peoples Child & Family Review*, 5 (1): 50-56.

Pallasmaa J. (2005) *The Eyes of the Skin: Architecture and the Sense.* Cornwall, UK: John Wiley & Sons Ltd.

Pasternak, S. (2017) *Grounded Authority: The Algonquins of Barriere Lake against the State* Minneapolis: University of Minnesota Press.

Pelegrin, J. (1993) A Framework for analysing Prehistoric stone tool manufacture and a tentative application to some Early Lithic industries. In A. Berthelet, J. Chavaillon (eds.) *The Use of Tools by Human and Non-Human Primates*. Oxford: Oxford University Press.

Pellini, J. R., Zarankin, A. & Salerno, M. (2015) *Coming to Senses: Topics in Sensory Archaeology.*

Pellisier, C. (1991) The Anthropology of Teaching and Learning. *Annual Review of Anthropology* 20: 75-95.

Pensky, A.E.C., Johnson, K.A., Haag, S., & Homa, D. (2008) Delayed memory for visual-haptic exploration of familiar objects. *Psychonomic Bulletin & Review, 15:* 574-580.

Perrot, N. (manuscript) Moeurs, Coutumes et Religions Des Sauvages de L'Amerique Septentrionale, Montréal, Presses de l'Université de Montréal, 2004 Collections de BAnQ.

Peters, M. (2008) Education and the philosophy of the body: bodies of knowledge and knowledges of the body. In L. Bresler (ed.) *Knowing Bodies, Moving Minds: Towards Embodied Teaching and Learning.* (pp. 13-28) London: Kluwer Academic.

Petition from Chiefs of the Algonquin and Nipissing Tribes of Indians at the Lake of Two Mountains to John Johnson. NAC RG10 Vol. 16: 12691-12694)

Piaget, J. (1971) The Theory of Stages in Cognitive Development. In D.R. Green, M.P. Ford & G.B. Flamer (eds.) *Measurement and Piaget.* New York: McGraw-Hill

Pilon, J-L., & Zacharias, S. (1984). Mocotagan, couteau croche algonquien: Techniques et origins. *Journal Canadien d'Archéologie, Vol. 10:* 17-37.

Pink, S. (2007) *Doing Visual Ethnography: Images, media and representation in research.* London: Sage.

Pink, S. (2015) *Doing Sensory Ethnography* (2nd Edition) London: Sage Publications.

Plato (1961) – *Theaetetus,* trans. F. Cornford, in E. Hamilton and H. Cairns (eds.) *The Collected Dialogues of Plato Including the Letters,* (pp. 845-919) Princeton, NJ: Princeton University Press.

Plegar, T.C. (2002) A brief introduction to the Old Copper Complex of the Western Great Lakes: 4000-1000 BC. Proceedings of the Twenty-seventh Annual Meeting of the Forest History Association of Wisconsin, Inc. 10-18.

Plegar, T.C. & Stoltman, J.B. (2009) The Archaic Tradition in Wisconsin. In R. Emerson, D. McElrath and A. Fortier. (eds.) *Archaic Societies: Diversity and complexity across the midcontinent*. State University of New York Press: New York: 697-724.

Primeau, K. & Witt, D. (2018) Soundscapes in the past: Investigating sound at the landscape level. *Journal of Archaeological Science* vol. 19: 875-885.

Pompeani, D.P., Abbott, M.B., Bain, D.J. DePasqual, S., Finkenbinder, M.S., (2014) Copper mining on Isle Royale 6500-5400 years ago identified using sediment geochemistry from McCargoe Cove, Lake Superior. *The Holocene:* 1-10.

Pompeani D.P., Steinman, B.A., Abbott, M.B., Pompeani, K.M., Reardon, W., DePasqual, S., Mueller, R.H. (2021) On the Timing of the Old Copper Complex in North America: A Comparison of Radiocarbon dates from different Archaeological Contexts. *Radiocarbon*, Vol. 63, Issue 2: 513-531.

Rajnovich, G. (1981) The Deer Lake Pictographs. In C. S. Paddy Reid & W. A. Ross (eds.) *Studies in West Patricia archaeology 2: 1979-1980.* Historical Planning and Research Branch, Ontario Ministry of Culture and Recreation Archaeological Research Report 16, Toronto: 281-308.

Reid, C. S. "Paddy" (1979) The Tranquil Channel Petroglyphs: Cultural Continuities in Lake of the Woods Rock Art, Papers from the Fourth Biennial Conference of the Canadian Rock Art Research Association, Victoria, British Columbia, *Heritage Record 8:* 245-53.

Reid, D. M. (1964) *Tales of Nanabozho.* Oxford University Press, London.

Renfrew C. (2001) Symbol before concept, material engagement and the early development of society, in I. Hodder (ed.) *Archaeological Theory Today.* (pp. 122-40) Cambridge: Polity.

Renfrew, C. (2004) Towards a theory of material engagement. In *Rethinking Materiality: The Engagement of Mind with the Material World,* edited by E. DeMarrais, C. Gosden, and C. Renfrew, pp.23-31. McDonald Institute for Archaeological Research, Cambridge.

Rexinkoff, I. & Dauvois, M. (1988) 'La dimension sonore des grottes ornees', *Bulletin de la soc. Prehist. Francaise* 85 : 238-46.

Robbins, P. & Aydede, M. (2009) *The Cambridge handbook of situated cognition.* Cambridge: Cambridge University Press.

Roediger, H.L. (1990) Implicit memory: Retention without remembering. *American Psychologist* 45: 1043-56.

Rogoff, B. (1990) *Apprenticeship in Thinking: Cognitive Development in Social Context*. New York, NY: Oxford University Press.

Ronda, J. (1979) "The Sillery Experiment: A Jesuit-Indian Village in New Francem 1637-1663" *American Indian Culture and Research Journal (3)* 1: 1-18.

Rose, S. (1993) *The Making of Memory: From Molecules to Mind*. New York: Anchor Books.

Rowlands, M. (2010) *The New Science of Mind.* MIT Press.

Rumelhart, D. & Norman, D. (1981) Introduction in G.E. Hinton and J.A. Anderson (eds.) *Parallel Models of Associative Memory*. Hillsdale, NJ: Erlbaum: 1-7.

Sacchetti, J.D. (1999) Rock gongs, bell rocks, ringing rocks, tocsin rocks, unknown in North America? Pity! *Arch Notes* N.S*.,* (4):5, 8-13.

Scarre, C. (1989) "Painting by Resonance" *Nature* 338: 382.

Scarre, C. & Lawson, (eds) (2006) *Archaeoacoustics.*Cambridge: McDonald Institute for Archaeological Research.

Schacter, D. L. (1996) *Searching for Memory: the brain, the mind, and the past.* Cambridge, MA: Harvard University Press.

Schacter, D. & Tulving, E. (1994) *Memory Systems.* Cambridge, Mass. : MIT Press.

Schacter, D. L., Addis, D. R., Hassabis, D., Martin, V.C., Spreng, R. N. & Szpunar, K. K. (2012) The future of memory: Remembering, imagining, and the brain. *Neuron* 76 (4).

Schafer, M. (1993) The Soundscape: our sonic environment and the tuning of the world. Rochester, VT: Destiny Books.

Schangler, N. (1994) Mindful technology: unleashing the *chaîne opèratoire* for an archaeology of mind. In *The ancient mind. Elements of cognitive archaeology*. eds. C. Renfrew and E. B. W. Zubrow. Cambridge: Cambridge University Press, pp. 143-51.

Shanon, B. (1998) Metaphorical Pluralism – not on the substantive level. *Behavioral and Brain Sciences* 21: 164-165.

Shapiro, L. (2011) *Embodied Cognition.* London: Routledge.

Sherman, P. (2008) "The Friendship Wampum: Maintaining Traditional Practices in Our Contemporary Interactions in the Valley of the Kiji Sìbì" in *Lighting the Eight Fire,* ed. Leanne Betasamosake Simpson, Winnipeg: ARP Press.

Shusterman, R. (1999) Somaesthetics: A Disciplinary Proposal. *Journal of Aesthetics and Art Criticism.* 57:3, 299-313.

Shusterman, R. (2012) *Thinking through the body: Essays in somaesthetics.* Cambridge, UK: Cambridge University Press.

Sinha, V. & Kozlowski, A. (2013) The Structure of Aboriginal Child Welfare in Canada. *The International Policy Journal, 4*(2): 3.

Simon, H. (1969) *The Sciences of the Artificial*. Cambridge, MA: MIT Press.

Skeates, R. (2010) *An Archaeology of the Senses: Prehistoric Malta.* Oxford: Oxford University Press.

Skorburg, J. A. (2017) Lessons and new directions for extended cognition from social and personality psychology. *Philosophical Psychology, 30* 4: 458-480.

Slafter, E. F. (ed.) (1880) *Voyages of Samuel de Champlain.* Vol I. Boston: The Prince Society.

Slafter, E. F. (ed.) (1882) *Voyages of Samuel de Champlain.* Vol III. Boston: The Prince Society.

Smith, M.M. (2007) *Sensing the Past: Seeing, Hearing, Smelling, Tasting, and Touching in History.* Berkley: University of California Press.

Smith, P. (2012) 'In the Workshop of History: Making, writing, and meaning'. *West 86th.* 19: 4-31.

Speck, F. (1915) “Myths and Folklore of the Timiskaming Algonquin and the Timagami Ojibwa”, Canada Department of Mines, Geological Survey, Memoir 71, No 9 Anthropological Series. Ottawa: Government Printing Bureau.

Spitzer, B. & Blankenburg, F. (2011) Stimulus-dependent EEG activity reflects internal updating of tactile working memory in humans. *Proceedings of the National Academy of Sciences, 108*(20): 8444-8449.

Stallybrass, P. Chartier, R., Franklin, J., Wolfe, M. & Wolfe, H. (2004) Hamlet’s Tables and the Technologies of Writing in Renaissance England. *Shakespeare Quarterly, Vol. 55* 4: 379-419.

Steinbright, J. (2001) *Qayaqs & Canoes: Native ways of Knowing.* Anchorage, AK: Alaska Native Heritage Center.

Steinbring, J. (1992) Phenomenal Attributes: Site Selection Factors in Rock Art. In Donald E. Weaver, Jr., ed. *American Indian Rock Art, volume 17,* 102-113.

Steinman, R.M. & Collewijn, H. (1980). Binocular retinal image motion during active head rotation. *Vision Research, 20,* 415-429.

Sterelny, K. (2004) Externalism, epistemic artefacts and the extended mind. In Richard Schantz (ed.), *The Externalist Challenge*. Walter de Gruyter, Berlin: 239-254.

Sterelny, K. (2010). Minds: extended or scaffolded? *Phenomenology and the Cognitive Sciences 9*(4)*:* 465-481.

Stern, D.G. (1991) Models of memory: Wittgenstein and cognitive sicence. *Philosophical Psychology* 4(2): 203-218.

Stiegler, B. (1998) *Technics and time, 1: The fault of Epimetheus.* (R. Beardworth & G. Collins, Trans.) Stanford, CA: Stanford University Press.

Stoller, P. (1989) *The Taste of Ethnographic Things: the sense in anthropology.* Philadelphia: University of Pennsylvania Press.

Stow, J. (1580) *The Chronicles of England*, London.

Suddendorf, T. & Corballis, M. C. (2007) The evolution of foresight: What is mental time travel and is it unique to humans? *Behavioral and Brain Sciences, 30,* 299-313.

Sudnow, D. (2001) *Ways of the Hand: A Rewritten Account,* (second edition) Cambridge, MA: MIT Press.

Sumrall, W. et al., (2016) A Review of Memory Theory *International Journal of Humanities and Social Science. 6(*5), 23-30.

Sutton, D. (2001) *Remembrance of Repasts: An Anthropology of Food and Memory*. Oxford: Berg.

Sutton, D. (2006) Cooking skill, the Senses, and Memory: The Fate of Practical Knowledge. In *Sensible Objects: Colonialism, Museums and Material Culture.* eds. E. Edwards; C Gosden; R Phillips. Oxford: Berg.

Sutton, J. (1998) *Philosophy and Memory Traces: Descartes to connectionism.* Cambridge: Cambridge University Press.

Sutton, J. (2006) Introduction: Memory, Embodied Cognition, and the Extended Mind. *Philosophical Psychology 19(*3): 281-289.

Sutton, J. (2008) Material Agency, Skills and History: Distributed Cognition and the Archaeology of Memory. In *Material Agency: Towards a Non-Anthropocentric Approach.* ed. C. Knappett, and L. Malafouris. Springer Science + Business Media.

Sutton, J. (2009). Remembering. In *The Cambridge handbook of situated cognition,* ed. P. Robbins and M Aydede, 217-235. Cambridge: Cambridge University Press.

Sutton, J. (2020) Place and Memory: History, Cognition and Phenomenology. In eds. Mary Floyd-Wilson & Garrett A. Sullivan. *Geographies of Embodiment in Early Modern England* Oxford Scholarship Online: 113-133.

Sutton, J. & N. Keene (2017) "Cognitive History and Material Culture" in D. Gaimster, T. Hamling & C. Richardson (eds.) *The Routledge Handbook of Material Culture in Early Modern Europe.* (pp. 44-56). London: Routledge.

Sutton J., Harris, C.B. Keil, P.G., & Barnier, A.J. (2010) The psychology of memory, extended cognition and socially distributed remembering, *Phenomomenology and the Cognitive Sciences, 9* (4): 521-560.

Sutton, J. & Williamson, K. (2014) Embodied remembering. In *The Routledge Handbook of Embodied Cognition,* ed. L. Shapiro. Routledge.

Szpunar, K. (2010) Episodic future thought: An emerging concept. *Perspectives in Psychological Science, 5*: 142-162.

Taussig, M. (1993) *Mimesis and alterity: A particular history of the senses.* New York: Routledge.

Taussig, M. (2015) Excelente Zona Social. In *The Corn Wolf.* Chicago: University of Chicago Press.

Thompson (2007) *Mind in Life: Biology, Phenomenology, and the Science of Mind.* Cambridge, MA: Harvard University Press.

Thwaites, R. G. (ed) (1899) *The Jesuit Relations and Allied Documents.* Vol 44, Relation of 1657-58. Cleveland: Burrows Brothers.

Till, R. (2009) "Songs of the stones: The acoustics of Stonehenge" in *The Sounds of Stonehenge. Centre for the History of Music in Britain, the Empire and the Commonwealth. CHOMBEC Working Papers No. 1,* ed. S. Banfield, British Archaeological Reports, British Series, No. 504: 17-42.

Tilley, C. (1994) *A Phenomenology of Landscape.* Berg: Oxford.

Toth, J.P. & Hunt, R.R. (1999) Not one versus many, but zero versus any: Structure and function in the context of the multiple memory-systems debate. In *Memory: System, process, or function?* eds. J.K. Foster and M. Jelicic, 232-272. Oxford: Oxford University Press.

Tribble, E. B. (2005) Distributing cognition in the Globe. *Shakespeare Quarterly, 56*(2): 135-155.

Trigger, B. (1990) The Huron, Farmers of the North. Wadsworth Publishing Co.

Trudel, M. (1976) The Seigneurial Regime. *The Canadian Historical Association Booklets,* No. 6

Truth and Reconciliation Canada. (2015). *Honouring the truth, reconciling for the future: Summary of the final report of the Truth and Reconciliation Commission of Canada*. Winnipeg: Truth and Reconciliation Commission of Canada.

Tsakiris, M. & Haggard, P. (2005) Experimenting with the acting self. *Cognitive Neuropsychology* 22(3/4): 387-407.

Tsakiris, M., Hesse, M.D., Boy, C., Haggard, P., & Fink, G.R. (2007) Neural Signatures of Body Ownership: A sensory network for bodily self-consciousness. *Cerebral Cortex, 17,* 2235-2244.

Tuck, J. (1976) *Ancient people of Port au Choix: The excavation of an archaic Indian cemetery in Newfoundland* (Newfoundland social and economic studies, no. 17). St. John's, Nfld.: Institute of Social and Economic Research: Memorial University of Newfoundland.

Tulving, E. (1983) *Elements of Episodic Memory.* Oxford: Oxford University Press.

Tulving, E. (2002) Chronesthesia: awareness of subjective time. In *Principles of Frontal Lobe Function*, ed. D. T. Stuss and R. C. Knight, New York: Oxford University Press, 311-325.

Tulving, E. & Markowitsch H. J. (1998) Episodic and declarative memory: Role of the hippocampus. *Hippocampus* 8, 198-204.

Vaccari, A. & Barnet B. (2009) Prolegomena to a Future Robot History: Stiegler, Epiphylogenesis and Technical Evolution. *Transformations Journal of Media and Culture. 17: 1-20* Accessed from: http://www.transformationsjournal.org/wp-content/uploads/2017/01/Vaccari-Barnet_Trans17.pdf

Van Dyke, R.M. (2019) Archaeology and Social Memory. *Annual Review of Anthropology.* 48: 207-225.

Varela, F.J., Thompson, E. & Rosch, E. (1991) *The Embodied Mind: Cognitive science and human experience.* Cambridge: MIT Press.

Vastokas, J.M. The Peterborough Petroglyphs: Native or Norse? In *The Rock Art of Eastern North America: Capturing Images and Insight.* C. Diaz-Granados and J.R. Duncan eds. pp. 277 - 289. Tuscaloosa: University of Alabama Press.

Vastokas, J.M. & Vastokas, R.K. (1973) *Sacred Art of the Algonkians: A Study of the Peterborough Petroglyphs.* Mansard Press: Peterborough, Ontario

Vimont, B. (1645) "Treaty of Peace Between the French, the Iroquois and Other Nations" In *The Jesuit Relations and Allied Documents 1610-1791*. (ed.) Reuben Gold Thwaites, Cleveland, OH: Burrows Brothers, 1896-1901, 27: 247-53.

Vizenor, G. (1991) *The Heirs of Columbus*. Hanover, N.H.: Wesleyan University Press.

Von Neumann (1958) *The computer and the Brain.* New Haven: Yale University Press.

Wagoner, B. (2013) Bartlett's concept of schema in reconstruction. *Theory & Psychology 0* (0): 1-23.

Wallace, A.D. (1993) *Walking, Literature and English Culture.* Oxford: Clarendon.

Waller, S. J. (1993) "Sound and Rock Art", *Nature* 363: 501.

Waller, S.J. (2000) Spatial Correlation of Acoustics and Rock Art Exemplified in Horseshoe Canyon. In Frank G. Bock, ed. *American Indian Rock Art, volume 24,* 85-94.

Wallin, N. I., Merker, B. & Brown, S. (2000) *The Origins of Music.* Cambridge Mass: MIT Press.

Walls, M. (2015) Making as Didactic Process: Situated cognition and the *chaîne opératoire*. *Quaternary International,* vol. 405: 21-30.

Watson, A. & Keating, D. (1999) Architecture and sound: An acoustic analysis of megalithic monuments in prehistoric Britain. *Antiquity* 73: 325-336.

Weaver, J. (2001) *Other Words: American Indian Literature, Law, and Culture.* Norman: University of Oklahoma Press.

Wegner, D. M. (2004) Precis of the illusion of conscious will. *Behavioral and Brain Sciences* 27: 649-692.

Welch, J. (1974) *Winter in the Blood.* New York: Viking.

Wheeler, M.E. & Petersen, S.E. & Buckner, R.L. (2000) Memory's echo: Vivid remembering reactivates sensory-specific cortex. *Proceedings of the National Academy of Sciences of the United States of America, 97*: 11125-11129.

Williamson, J. A. (1962) The Cabot Voyages and Bristol Discovery Under Henri VII. Hackluyt Society at the University Press: Cambridge.

Wilson, M. (2002) Six views of embodied cognition. *Psychonomic Bulletin and Review, 9,* 625-636.

Wittgenstein, L. (1980) Remarks on the Philosophy of Psychology, vol. I, ed. G.E.M. Anscombe and G.H. von Wright, trans. G.E.M. Anscombe, Oxford: Blackwell.

Wulf, C. (2017) Production of Body Knowledge in Mimetic Processes. *Aisthesis* 1(1):7-20.

Wynn, Coolidge (2011) The implications of the working memory model for the evolution of modern cognition. *International journal of evolutionary biology* vol. 2011: 1-12.

Younging, G. (2009) "Inherited History, International Law, and the UN Declaration." In G. Younging, J. Dewar and M. Degagné (eds.) *Response, responsibility and renewal: Canada's truth and reconciliation journey.* (pp.323-36) Aboriginal Healing Foundation.

Zawadzka, D. (2007) "Canadian Shield Rock Art and the Landscape Perspective" (Masters Thesis) Trent University, Peterborough, Ontario, Canada.

Zawadzka, D. (2010) Canadian Shield Rock Art as *Gesamtkunstwerk:* Aesthetics of Place and Landscape. Estética e Arte Rupestre (Aesthetics and Rock Art) Congresso Internacional da IFRAO 2009: Piaui, Brazil.