AFTER ICE

Cold Humanities for a Warming Planet

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Prologue: Iceland

It takes a few hours of driving from Reykjavik to arrive at Langjökull (the long) Glacier. A classically bland parking lot is the staging point for a rickety bus to pick up our group. The driver is from Lublin, in Poland, and this is seasonal, summer work for him – ferrying people up and down the access road from the small town of Husafell up to the edge of Langjökull, Iceland's second-largest glacier, which is roughly fifty-five kilometres long and twenty wide. He drives expertly and quickly, taking steep bends on the gravel road without slowing down much. Like on the rest of the island, particularly in the vicinity of Reykjavik, tourism's entrepreneurial, infrastructural tentacles have made their way to Iceland's glaciers. Once the bus pulls in, we all disembark and get ready to board buses of another kind – converted NATO rocket launch vehicles that will take us up onto the glacier (see Figure 0.1). With special wheels that can detect the firmness or softness of the ice and snow under its tread and deflate or inflate according to need, they are both out of place and perfectly suited for traversing the glacier's incline. The group disaggregates and morphs into smaller sets of five to ten who will be accompanied by an individual guide. You have the option of donning a one-piece snowsuit and warm boots. However, Langjökull is a temperate glacier, caressed by the Gulf Stream, whose temperature hovers around zero degrees Celsius, with the density and pressure of the ice increasing as it gains

0.1 Into the Glacier vehicle on Langjökull Glacier. July 2017. | Rafico Ruiz

0.2 Lit tunnel within Langjökull Glacier. July 2017. | Rafico Ruiz

0.3 LED-lit bench within Into the Glacier tunnel system. July 2017. | Rafico Ruiz

depth. And that is precisely what this vehicular incursion has led us to – an opportunity to go "Into the Glacier."

The attraction, which opened in 2015, is the largest system of human-made ice caves in the world. Glaciologists and engineers had envisioned a perfect circle traced through the ice; however, when the two groups began tunnelling in opposite directions, what they ultimately formed is a somewhat imperfect and skewed heart (see Figures 0.2 and 0.3). Since glaciers are, of course, defined by their mobility, the lifespan of each tunnel is in the range of ten years, with individual tunnels requiring annual maintenance to account for a range of motion of approximately fifteen metres. LED lights are embedded in the walls and ceilings, with plastic matting ensuring a stable footing. With a chapel and rooms enhanced with lighting effects, one gets a feeling of unease, of definite trespass, that your warm breath passing over the walls is unwelcome, that the integrity of the glacier has been compromised in some way. And yet, the bare, glacial attractive force of seeing moulins from a few feet, of experiencing the blue drop of crevasses that pass through the ice like ovoid lightning strikes – both give you a feeling akin to vertigo; you reel, not sure which way is up, and the slightly toxic if useful LED glow enhances the effect of a blue so blue it swallows you entirely. You get a sense that the glacial ice is moving and you cannot quite feel it or see it.

This, of course, is not the first human claim made on Langjökull – its meltwater provides the city of Reykjavik with 80 percent of its drinking water; its downward motion powers a hydroelectric plant. Warming air masses and decreased precipitation are thinning it as well. It is too easy to see its twisted heart as the sadly perfect outcome of the planet's damaged and warming cryosphere.[1]

Langjökull's unnatural cracks and fissures are suggestive of the social complexities that the cold humanities articulate not as a simple disciplinary apparatus but rather as a specific orientation within the field of the environmental humanities that can address an increasingly "liquescent politics" – neither ice nor water, a phase transition that is constantly in transition toward another state.[2] This is present in urgent and material ways across the Arctic in particular, which is a geographic focus of this collection. Iceland amplifies and registers the planet's waning capacity to cool. It is connected to places such as Upernavik in northwestern Greenland, which, as Mark Nuttall describes, is contending with uncertain forms of melt but that nonetheless remains fundamentally icy, and in that state retains all the rights, responsibilities, and knowledges of "cryohuman" relations – ones that should take precedence over experiences of and often economic claims

made on ice undertaken by corporate, governmental, and other carbon emitters of the Global North. If, as Nicole Starosielski contends, "temperature is a mode of environmental description attuned to the speed and rhythm of movement, the densities of substances, and their sensory effects," the work of describing experiences of waning ice-derived cool falls on the cold humanities as a heavy burden but also as its foundational premise.[3]

How then to define cold experiences emerging from ice on a warming planet? This is a guiding question for the *After Ice* collection. Ice melts in a phase transition to water. It is always on the move. It is an open relation to other states, location, and matters. Ultimately, it makes room for elemental encounters premised on its ability to cool material. Cooling establishes a causal and temporal relationship with the phase of matter that is ice. However, water is matter that contains the potential of ice and is a synecdoche that today is broken through the reach of global warming. The cold humanities emerge from the fate of ice on our planet defined by the effects of global warming. They are anchored by commitments to largely Indigenous communities across northern latitudes but also to a more diffuse array of cold experiences that emerge globally in relation to ice's capacity to cool. We put forward the term "cold humanities" as a way to gather together diverse approaches to ice as a phase state of water. In becoming a less typical phase, ice (and water) is undergoing accelerated material and social changes due to the broad environmental and cultural effects of global warming. This condition generates the uncertain "after" in the collection's title. What does the future hold? Will it be "ice-free" or will this be understood more as being "ice-less"? How has waning cold become an experience linked to at-risk ice, especially in northern Indigenous communities? How does the temporal and experiential horizon of diminishing ice become manifest in an array of cold cultural practices, from refrigeration as social care to notions of archival loss premised on low temperatures (Hogan and Roberts, Chapter 6, this volume)?

A New Cryosphere

What comes after ice? Once, the answer would have been water. However, in our carbon-defined present, with its disrupted hydrological cycle and climate warming, ice is no longer the reliable feature of higher latitudes or winter seasons. Of course, an element such as water was and is always in transition. Under variable temperature conditions, it is a unique medium that either tips toward temporary frozen stasis or bubbles into vaporous moisture. The cryosphere, from Greek κρύος, *kryos*, "cold," "frost," or "ice,"

and σφαῖρα, *sphaira*, "globe, sphere," traditionally and, particularly across Western, imperial contexts, meant those areas of the planet where water is frozen, including all forms of snow, ice, and permafrost. Today, the cryosphere has shifted out of its semantic designation as ice geographies. In this sense, a new cryosphere is emerging. It exceeds frozen water to encompass cold experiences that are tempered by the uncertain horizons of melting ice. This collection examines the implications of the end of reliable cycles of freezing and thawing and the future of the cryosphere becoming increasingly determined by human actions and behaviour. Often this comes to the detriment of Indigenous peoples across the Arctic with long, complex lifeways in situ and across the material complexity of icy environments.[4]

Scale can obscure narratives and forms of Indigenous survivance. The majority of humans on this planet neither inhabit nor directly experience the cryosphere of the changeable and damaged ecosystems of the poles, high latitudes, or mountain heights. In these sometimes sacred places, the presence of phase transitions from ice to water is most clear. Yet, glacial ice's intimate, elemental counterpart, sea-level rise, traces relations between the maintenance of cold polar ecosystems and the hydrological and meteorological regimes that the entire planet relies on. We argue that ice and the cryosphere are more than temperature-based matter or regions. Ice and cold have long had a social and political life; they generate and maintain social conditions that produce a spectrum of human and nonhuman responses, and ones that are becoming more urgent and detrimental, intimate and global through the reach of atmospheric and oceanic warming, with a notable amplification and urgency for Inuit and other Indigenous lives that are ongoing in the Arctic. Bound together by the poles like bookends, we are all, human and nonhuman, dependent on cooling and cold as much as on warmth for atmospheric and ocean circulation, for refrigeration, and for body cooling. Yet the stakes of cooling, and its bodily and environmental effects, are uneven and unequal.

This collection's title signals three lines of inquiry for a cold humanities. The first pivots around what seems at first glance to be a qualification with regard to time – the "after" of ice. This after signals the transformed understanding of ice into a social and material composite. This is the broken hydrological cycle – one in which ice no longer holds the potential to cycle through water and gas. Through this lens, ice becomes a material that is deeply anthropogenic and relational, particularly as it is tied to the waning ability of the planet to maintain a steady temperature range and to social interventions and support.[5] We propose a "postmaterial" approach that

argues that the humanities are central to material sciences. Materials need to be understood in the ways they are profiled according to their social relevance, dependencies, and use. As a rubric, "after ice" encompasses a tragic state of elemental affairs. We turn the attention of the environmental humanities toward the human and nonhuman consequences of attenuated cooling. The collection is not so much an attempt to follow the demise of ice, as we do not subscribe to declensionist narratives around ice, particularly as they obscure ongoing and largely Indigenous modes of sovereignty that depend on its presence. Rather, we see this as a critical occasion to track its *social elementality*: we are after ways of defining the temporal, spatial, and material registers of cold experiences on our warming planet.

Our second research front attends to the work of defining the cold humanities. The contributors to this volume suggest that cold is a social condition that is emerging from a post–global warming understanding of ice. Its crisis is what generates the conjuncture of the cold humanities. It is this specificity that distinguishes the cold humanities from recent calls for an "Arctic Humanities" or for more broadly situated cryohumanities that are intimately tied to the varied ices of the cryosphere.[6] The cold humanities are anchored by a concern for largely Indigenous communities across the Arctic and by extension the changeable elemental understandings of ice and its waning capacity to cool. While our focus is the Global North, we do not intentionally exclude the Antarctic or the wider array of high alpine sites across the cryosphere. They are of course linked as part of a single "cryoscape" infused with human social practices on and with ice.[7] If anything, Antarctica in particular has lent itself most favourably to thinking through the encounter between a notion of modernity reflected in the environmental damage wrought by the Anthropocene and the accelerating changes of ice on a continental scale.[8]

While contributors to this collection maintain a spectrum of disciplinary commitments – environmental history and science and technology studies, game studies and cultural anthropology, information studies and cultural theory, Indigenous studies and philosophy – they share a position around cold as an affective encounter that involves humans yet also recursively loops back to nonhumans and to the accelerated phase transitions of global warming. The environmental humanities and its scholarly apparatus of journals, associations, and so forth are a sound commitment to the political ecological project across a wider spectrum of cultural phenomena – how human-induced environmental violence is a mode of inscription that registers across both media and environments as media. But perhaps substituting

"elemental" for "environmental" in this coupling can accomplish a more honest materialist and political ecologization of the humanities? The cold humanities is an effort to follow where ice as a relationship-building phenomenon leads. Previous humanities research has focused mostly at the edges of the cryosphere, where ice transitions toward water, where its cooling effects are most manifest.[9] These edges have moved to higher latitudes and mountain altitudes as the climate warms. By way of contrast, the cold humanities are invested in the relational constitution of ice as a material that holds the capacity to cool and that generates a wide array of cultural encounters across media and geographies.[10]

Third, and perhaps most evidently, is the open question of how to define, describe, and materially *characterize our warming world*. If cooling is in decline, dryness at certain places on the planet is also at risk. Ice sheets, the result of millennia of accumulated and frozen precipitation, are deserts thinning one crystalline layer at a time. In this sense, melting ice can also mean attenuating dry environments.[11] Global warming thus includes a reconstitution of matter and its elemental manifestations. While warming seems to suggest variance amidst a possible range, this is no longer the case. "Warm" is now a temperature mean that will affect how humans and nonhumans cocreate and relationally define worlds and "thermocultures."[12] This will impact how and in what ways "cold" is assumed as a cultural right, a bodily state, and a natural condition. If we are all warming, then this also means that we are all experiencing redefinitions of cooling: Inuvialuit in Nunavut with air and ocean currents that are too hot, Southern Californians with soil that is too dry.

This is a collective scholarly project that attempts to situate ice as a state of matter currently subject to drastic phase change through warming. It considers how the environmental dimensions of melt and warmth express varied forms of political economic power and human stories. Ice is both a phase of water and a milieu for the creation of semantic and embodied worldmaking and sensemaking. This dual understanding of ice, as both elemental and social, positions the cold humanities as an extension of the environmental humanities that both mobilizes often overlooked ice-driven historical inquiry while also charting the relationships that will arise between humans, nonhumans, and emergent understandings of temperature in light of global warming. It has the potential to become a robust and collaborative subfield that can build on political ecology's early indictment of the political, human affairs that so often absorb land, atmosphere, water, and ice as property, modes of production, and repositories for the chemical

by-products of profit. At the same time, the cold humanities can also attend to the narrative labour performed by post–global warming environments and elements. Whether in their incarnations as blue (oceanic) or green (more broadly concerned with waste), the humanities persist as a commitment to tracing the elemental imprint of human activities – these are just as much narrative modes of inscription, the stories we tell, as a raft of forms of pollution, from plastics to pesticides; both impact our planet's ecosystems in profound ways. Researchers with an investment in the environmental humanities can engage with the cold humanities through the wide spectrum of conditions enacted by waning coldness and melting ice. Water in its liquid state in particular has generated a range of exciting directions within the field, attending to questions of posthumanism, critical race theory, and gender.[13] Many of the chapters in this collection consider ice as a temporary solidification of liquid water and will further theorize phase transitions as a crucial processual condition to follow when characterizing ongoing relations between particular environments and human activities.

Contributors to this collection offer the affective and sensorial "cold" as a means of creating common experiences on our warming planet, particularly in relation to the site specificity of certain climate change narratives. How might we reflect on the experiential dimensions of ice? The scholars assembled here outline the positionality of the cold humanities working outward, temporally and spatially, from the material, semantic, and sensorial environmental knowledges and ontologies that cold and lifeworlds after ice create.

The Changing Politics of Ice

Ice has always been a mobile phase of matter. Its mobility depended on ambient temperature conditions – glaciations and ice ages were the result of stable temperature ranges across particular biomes.[14] Ice, in the form of glaciers, is subject to gravitational forces that make these volumes of ice into dynamic bodies, fields of action that shape-shift and move. The adjective "glacial," under contemporary conditions of ice loss, is no longer necessarily tied to views of incremental and gradual time but rather to accelerating ecological change.[15] It is this double cultural bind of ice that structures many of the approaches to cold experiences across this collection. Ice and a steady cold state that can maintain freezing are temporal markers of preservation and stasis. Yet, ice is also capable of transitioning across multiple phase states in response to temperature change and thus can be a medium that registers immediate and abrupt variance.

This collection emerges in the wake of the consolidation of social science terms such as "cryopolitics." These depart from the geological and geographical or the medical uses of "cryo" as a suffix, such as "cryotherapy," "cryobiology," or "cryosurgery." Michael Bravo and Gareth Rees originally deployed this term in the context of an Arctic grappling with contemporary issues of resource rights and divergent claims to maritime sovereignty and access.[16] The term was subsequently recast by Emma Kowal and Joanna Radin to take into account the biopolitical dimensions suspended within the technical maintenance of low temperature. They paid particular attention to the fate of biological specimens and the ethics and power dynamics of temperature-dependent understandings of science and technology – an ambient condition that "produces a zone of existence where beings can be made to live and are *not allowed to die*."[17] As Kowal and Radin address in their foreword to this collection, the work of temperature maintenance produces a manipulable time axis, often structured by the poles of life and death in an assemblage where Foucauldian biopolitics permeate decision-making processes, technical systems, and acceptable ways of living and dying that do away with dichotomies on a spectrum. In their own volume, they astutely observe how some forms of anthropogenic environmental violence have also pushed nonhuman phenomena into a "state of not being allowed to die." They inhabit a phase state of indefinite "suspension," subject to carbon-defined temperature variance. "It has come to apply to glaciers and sea ice," they write, "the melting of which threatens human survival both directly through rising sea levels and indirectly by endangering life forms that sustain human foodways."[18]

It is this gap between the material dimensions of situated, melting ice and life and death, or deferral of both, that animates our contribution to thinking across this cryopolitical seam in a warming contemporary conjuncture. As Bravo observes, "Cryopolitics is arguably nothing less than a struggle over the temporalities of the globe's frozen states and our growing industrial-scale consumption of them."[19] In the roughly half-decade since that collection, "after ice" has become more evident – the natural capacity to generate cold is waning. We build on Bravo's call to revalue cooling and the planet's cryosphere as an essential lifeworld and as a set of climate generating systems that retain their own modes of integrity and existence. These are independent of largely Western (or "southern" in relation to the view from the circumpolar north), agrarian views of ice as antithetical to growth, production, and surplus value. Reflecting on "temperate normativity," Jen Rose Smith has commented, "The call to invent a new cryopolitics asks that we

show greater appreciation of the importance of our frozen states and how they are created, destroyed, and preserved in their industrial, laboratory, and planetary ecological settings."[20] *After Ice* thus takes inspiration from this cryopolitical orientation and seeks to immerse itself in the relational temporalities that ice is not only part of but continuously creating. As Esther Leslie puts it in her chapter, "To think in polar or thermal terms, through ice and without ice, is to think in entwined fashions and dialectically."

Arctic Coldness

Competing definitions of "coldness" emerge across *After Ice*. These focus on different experiential and affective permutations of ice. The definitions in turn entail calls to action, "cryohuman relations," that are both exculpatory and funereal (Howe) ecologies as means of understanding temperature variation (Chang). Ice and cold have become unreliable natural phenomena. Indigenous communities across the circumpolar world are essential holders of knowledge of the cryosphere – and often the first human communities to be burdened with the need for climate "adaptation." Sea ice in particular is a domain of hunting and transit and retains its own agential "social life" in Inuit and Iñupiat storying and experience.[21]

The experiential time that the accelerated phase transitions of ice currently make available is inevitably anchored by intergenerational obligations – the near future will no doubt be a warmed present. Following Eve Sedgwick, *After Ice* seeks a mode of analysis that thinks "beside" the nonlinear phase transitions of ice, encountering it as material that is open to "textural" relationships that run along its melting surface and register its substantive, elemental, historical weight.[22] Sedgwick's characterization of this relationality captures a mode of engagement that appreciates the micro affordances of ice as an elemental phase of water as well its macro relations with institutionalized forms of coldness. By contrast, Sheila Watt Cloutier's well-known claim to the "right to be cold" is a claim by northern residents and their leaders to a sovereign, northern environmental understanding of first-order carbon effects.[23] For Indigenous citizens of Kalaallit Nunaat (Greenland), Qablunaat (non-Indigenous, largely southern and white) views on ice as a lifeworld are a colonial overlay on *pinngortitaq* – a multidimensional environment of all that is, has been, and will become.[24] Qablunaat are responsible for the creation of "dark ice," the thinning, darkening edges of the Greenlandic ice sheet, that can be made out pixel by pixel in the five hundred square metre areas of square shapes that correspond to the resolution of satellite images.[25] It is in the midst of this agential responsibility that

this collection is immersed – in the primarily southern, Qablunaat responsibility for carbon emissions.

Hunters in Northwest Greenland describe how, on occasion, a small iceberg in a bay, seen at a distance and under the right light conditions, can fool you into thinking that it is a polar bear, still and looking back at you. This bear is trying to draw you out onto the ice.[26] This collection assumes a similar shape-shifting role for ices across their phase transitions. These shifting, mobile ices can recalibrate how carbon-intensive societies are accountable to a wide range of cooling phenomena in a warming world. *After Ice* draws out the accountability of carbon-intensive social formations in order to create moments of exposure – a feeling akin to walking across cracking, thinning sea ice. It recalls the opening moment of Yankton Dakota writer Zitkala-Sa's memoir when she realizes that she has been forced to live within a settler colonial world under the sign of the "paleface day."[27] The contributors to this collection seek to write back against the foreshortening of narratives of southern responsibility, complicity, and restitution. Permafrost, sea ice, glacial tongues, ices have become unreliable through warming air and ocean currents. Southern societies are indeed "beside" the textural conditions of ice they have created – moored to their accelerated phase transitions by warming carbon dioxide and, to a more abrupt and grave effect, methane.[28] If, as Maud Barlow suggests, settler societies in particular are in need of a "new freshwater narrative," the phase transition of ice to water and its attendant capacities to cool are also ready for a more just set of stories that subtend southern political economic regimes.[29] A Schwab Capital Markets slogan says: "Water is hot."[30] Yes, it is; however, the Atlantic Meridional Overturning Circulation, which carries heat originating near the equator all the way up to the high latitudes of the North Atlantic, will slow in response to the cool water flowing from the melting Greenlandic ice sheet. It is already having consequential effects on the planet's climate system, with the heatwaves in Europe being one of its clearest manifestations.[31]

Today, around 400,000 Indigenous people live permanently in the Arctic region.[32] However, apart from Indigenous peoples in the circumpolar sphere, melting ice and a life "after ice" intrudes intimately on the lives of other Indigenous groups, who, while being geographically very distant from each other, share the experiences of a changing climate and melting cryospheric environments. Islanders' lifeworlds on the seas and with rising sea levels are also dissolving in a literal sense as they are reshaped and washed away by changes in the cryosphere.

Chapter Overview

After Ice flows across three interrelated parts: Cold Humanities for the Arctic; Warm, Cool, Icy: Changing Cold Social Conditions; and the Cultural Afterlives of Ice. While thematic concerns weave across the full spectrum of chapters that make up the collection, each part nonetheless has core concerns. Each chapter brings "after ice" into higher resolution – each is an attempt to still the relational dynamics of ice and give dimensionality to what is so often seen as a precarious, temporary phase of matter.

Part 1: Cold Humanities for the Arctic

The first section approaches ice *as a source of cultural praxis* for Indigenous communities across the Arctic and introduces the specifically human commitments of the cold humanities. The initial chapters examine how humans centre ice and its affordance of cold across diverse practices, from tracking glacial death in Iceland to thinking more cyclically with the seasonality of ice, settler colonialism, mobility, and disease. These practices push ice and coldness across registers: semiotic, material, and more diffusely environmental. The chapters seek to characterize how these practices are articulated through settler colonialism's claiming of icy environments and narratives, including what could be thought of as the most contemporary colonial force: carbon-driven warming.

In the opening chapter, Cymene Howe examines how the phase transitions of glacial ice are intimately tied to rates of social and cultural change in Iceland: transformations that not only allow for the local to be thought at once with the global but that also become evidence of how "dead ice" can coshape particular cryohuman relations. Howe opens with a funeral for the Icelandic glacier Okjökull. A brass plaque marking where the glacier once flowed bears "a letter to the future" that notes the atmospheric concentration of carbon dioxide at the time of its liquescence. She foregrounds how Icelanders live and die alongside glaciers and how such commemorative cultural practices also serve to build a collective sense of social purpose in the face of warming global temperatures that become manifest through a range of "proxies for glacial life" – rare polar bear interactions on the island, the rhythm of winter waves where cracking sea ice once echoed. Howe tracks across the affective registers glaciers produce for Icelanders who live in proximity to their now unnatural changeability. She attends to the simple fact that in melt "we find heat absorbed." However, this process of absorption is mediated by affective, cryohuman relations that, even within the relatively homogenous microcosm of Iceland, refract the complexity of ice's

crystalline structure. Iceland, with small and reactive glaciers, becomes a sort of "uncontrolled experiment," both human and glaciological, for southern carbon effects.

While Howe foregrounds the memorialization of a glacier, Hester Blum analyzes the first published Inuvialuit autobiography, *I, Nuligak* (1966), written by an Inuvialuk man from what is now called the Inuvialuit Settlement Region of the Northwest Territories in Canada. Its translation and editing by a French missionary exemplify the dominant temporal regularity and linearity that Qablunaat have imposed on the temporalities of Indigenous peoples. While the original biography provides insight into Inuit Qaxujimajatuqangit, or Traditional Knowledge, as well as strategies for living in an anthropogenic timescale, the repeated misapprehensions in the Qablunaat interpretation illustrate the collision of the Indigenous and Qablunaat forms of temporal regulation. Settler time has been institutionalized and imposed upon Indigenous temporalities within discourses of climatic extremes in the Arctic. Blum highlights Yupik Elder Mabel Toolie's insight that "the Earth is faster now" and uncovers the consequences of mistranslation for contemporary Indigenous knowledges in the Arctic.

Extending an analogous line of memory work around the temporalities facilitated by ice as material and lifeworld, Liza Piper takes readers onto the Mackenzie and Yukon Rivers between 1860 and 1930 in what is today known as the Yukon and Northwest Territories in the settler state of Canada to examine how the freeze-up and breakup of river ice instituted a seasonal rhythm of circulation that was experienced in distinct ways by settlers and Indigenous communities. They focus attention on the role these seasonal moments of ice crystallization and dissolution played with the spread of epidemics. Piper observes how traders, missionaries, and representatives of the Canadian state gradually mimicked and followed the cryosphere's patterns of temperature-based, cyclical change with a view to extending what were often global networks of commodification. River travel became a practice that could spread or curtail disease (scarlet fever in the mid-nineteenth century, influenza in the 1920s), with the most devastating effects felt by Indigenous communities who were most directly touched by southern-based economies of colonization. Freeze-up and breakup provide seasonal frameworks to understand how these communities were not merely, as Piper contends, "sites of vulnerability" but rather integral parts of broader colonial ecologies that could sometimes resist the settler flow of goods and disease. Indigenous ice thus implies epistemologies that are bound by the scales of time and space. Julie Cruikshank famously asks through Dene and

other sited narratives, "Do glaciers listen?"[33] They do, and southern humans should also attune their senses, evidentiary and otherwise, to glaciers' prominent role in the nonhuman amplification of our environmental impacts.[34]

Part 2: Warm, Cool, Icy: Changing Cold Social Conditions

Ice is an obvious materialization of coldness. Ice gives the concept and sensation of cold a presence and weight. Ice is also a semantic concrescence of cold that is available for metaphoric use and whose historical cultural associations weigh on and also obscure other approaches, such as Indigenous understandings of and ways of being with cold. If one important dimension of our relation to ice is the thermal dimension, a second is the manifestation of basic thermodynamics in the phase change from solid to liquid, from ice to water, in melting. While the history of using ice as a coolant dates back to ancient times, the historical quality of ice as a bearer of coldness links it not just to cooling or food preservation but to human aspirations of gaining control over their world. Ice is more than low temperatures; it has cryopolitical implications.

The transformation into techno-scientifically mastered systems of controlling low temperatures that occurred in the nineteenth century was revolutionary. A range of scholarly work has observed how the networked systems for artificial refrigeration and cooling objects and spaces have created an artificially produced, networked coldscape where coldness is capitalized through the transformation of energy flows into a tradeable commodity.[35] In the twentieth century, "Cold War" was the widely used metaphor for the geopolitical conflicts of the post–Second World War period. This metaphor pointed to the static, frozen hostilities between the parties without "hot" military actions.[36] But major demands for cooling arose in science and in the operation of digital technologies that involved the miniaturization of integrated circuits. While the warming planet is losing its naturally occurring source and manifestation of coldness as ice, the desire of humans to consume energy-intensive, artificially produced coldness happens on an industrial scale. Currently, the roughly 3 billion appliances for producing coldness (refrigerators, air conditioners, heat pump systems) worldwide consume about 17 percent of overall global electricity, and this demand is projected to exceed energy demand for heating within the next decades.[37] Through fossil-fuel based artificial refrigeration, the "development of systems for manufacturing and regulating cooled and frozen states [is at] the heart of global thermodynamics in the Anthropocene."[38]

The chapters in the second part consider an array of *cold sites, knowledges, and power relations*. Their specificity, as each contributor shows, is crucial to understanding how cold and its cooling effects are becoming a social condition that is locked into site-specific cryohuman relations. The experience of cold and cooling, as the chapters draw out, can be mediated through archaeological evidence or atmospheric gases such as methane. Ice and the cryosphere, very much like land, can be made subject to what Tania Murray Li describes as "inscription devices" – "the axe, the spade, the plow, the title deed, the tax register, maps, graphs, satellite images, ancestral graves, mango trees" – all of which have the purpose of making that land into an available resource.[39] The phase transitions of ice, as Ruiz has shown, can be similarly commodified, and rendered profitable.[40] Yet as each contributor makes clear, these modes of inscription can also be designed and read against the grain – for example, by valuing care practices of refrigeration or by tracking what archives emerge through melt.

The historical backdrop for our present-day consumption of coldness in energy-intensive societies is highlighted by Rebecca J.H. Woods in this part's opening chapter. The nineteenth century witnessed a scientifically based ontological transformation of the concept of cold into a reconfiguration of cold as a commodity and a technique for producing stasis. The commodification of coldness materialized in the creation of cold chains that became one transforming driver of global food systems and the rise of commerce in perishable products such as meat.[41] In her chapter, Woods excavates the natural historical dimension of the refrigeration revolution in the nineteenth century. She explores how the revelation of intact mammoth flesh in Siberian rock ice was linked to the public understanding of refrigeration as an application of thermodynamics and how it fed into the heated debates around the British Empire's pressing challenges to secure meat provisioning for its increasing population. The chapter shows how the frozen mammoth became a reference point for the case of preservation in conditions of extreme cold and the introduction of mechanisms to apply this coldness to secure an increased food supply.

Juan Francisco Salazar and Jessica O'Reilly sketch a politics of twenty-first-century methane release due to melting permafrost. Permafrost is a layer of gravel and soil bound by ice that lies a metre or more below the ground or under deep water. It may be cyclical, melting and freezing seasonally, or at more insulated depths, it may be hundreds of thousands of years old. When it melts, the ground collapses, endangering the stability of

landscape features such as hillsides and undermining the foundations of buildings erected on this ground. However, beyond the socioeconomic impacts of permafrost melting, to see methane as political is to remove it from the scientific and technical discourses and practices of permafrost geologies and organic chemistry and place it in a postmaterial optic, or perhaps what is more often called "new materialism." Methane is a climate-changing force of increasing urgency given this source, sequestered under and in permafrost layers that are now melting. Once it is released, it has the ability to trap heat within the atmosphere to an extent that far exceeds that of carbon dioxide and other greenhouse gases. Salazar and O'Reilly build this material politics up by relaying together the scales that are implicated in its release – from the work of microbes to the material constitution of mud and ice that have entombed methane – and are careful to track how this is a vital process of co-constitution of nonhuman, material, and thermal change. They move away from a horizontal analytics of material constitution to pay attention to the open-ended and multidimensional stakes that emerge from the atmospheric and terrestrial implications of methane as a greenhouse gas. Their analysis is largely grounded in Siberia, a region experiencing accelerated permafrost melting. However, this problem affects all northern and high mountain regions. They ask us to attend to these materials and microbes released by thawing permafrost and to increasingly soft, muddy ground as the everyday occurrences of global warming. "The politics of these materials are entangled in thermal regimes of cold, hot and warm," they write, "where mud is one consequence of melt and melt is one cause of surging lifeforms." This material politics weaves the nonhuman and human together to describe how temperature variance moves like a gusty breeze – affecting some lives more than others, intensifying here and not there, and always present if not felt.

Finally, Mél Hogan and Sarah T. Roberts extend the changing social conditions of ice in three cases of failed cryotechnical preservation that accidentally allowed seeds, carcasses, and embryos to thaw. With warming an ever more acute threat, they work through the semantics of "meltdown" as it relates to sites of storage that are set apart for future use – cold storage that melts, archives that no longer hold, and other sites and examples of hegemonic cultural expectations of reproduction, Western futurity, and valences of death itself. Such practices of indefinite cold storage enact a politics of time and scale. Whether "natural" cold in permafrost or technically produced artificial refrigeration, cold is a physical state and ideal that can never really be maintained within human time. It is a false abstraction that

will always be tinged with a sense of existential threat. Melt becomes, following Elizabeth DeLoughrey, a case of anticipatory mourning, where the phase transitions of ice and concomitant states of variable coldness hold within themselves fears of thawing to come.[42] Focusing on attempts to stop meltwater from entering the Svalbard Global Seed Vault or designing ever more reliable forms of embryo preservation that can sustain capitalist reproductive regimes, their chapter draws out the important biopolitical consequences of Kowal and Radin's understanding of cryopolitics to show how our attempts to freeze time as a human praxis in the face of uncertain temperature variation will ultimately come to an end.

Part 3: The Cultural Afterlives of Ice

The chapters in this section grapple with the *cultural meanings of the melting cryosphere*. Ice is a register of the passage of time – not only its duration, the time it takes to melt, but also the strata that are laid down as ice builds up over eons in glacial sheets. The shift from a cycle between these two forms of ice temporality toward a steady melting of glacial and polar ice confronts us with one of the most dramatic large-scale alterations caused by climate heating. For southerners, this is a far-off change that we experience second- or third-hand as out of sync weather patterns and rainfall effects. However, seeing the rapid retreat of mountain glaciers, for example, outpaces and exceeds inherited knowledge within which ice has been known. The chapters in this section both theorize and derive methodological insights for exploring the ontological transitions and changes in phase state that are taking place. They share an interest in relational thought that considers the inseparable entanglements of science and culture, capital and nature, environment and society. These are precisely the domains that have been kept apart in classical scientific disciplines and that underpin the setting apart of disciplines such as glaciology.

In this section's first chapter, Alenda Y. Chang focuses on digital and analog games. Game play is a mediating practice that allows for contested understandings of the cultural effects of mass melting. She draws on examples that push "southern," metropolitan, Qablunaat game players into a certain polar imaginary, occasionally informed and designed by Indigenous experiences of the cryosphere. This experience can reveal how southerners' "landscape of expectation" must respond to current climatic changes across the circumpolar world. Chang constructs an "ecology of games" that crosses a spectrum from physically embodied sports to digital media. At one end of this continuum, warming climate conditions threaten the long-running

Arctic Winter Games hosted in Northern Canada, Alaska, and Greenland since 1970. At the other end of the continuum, digital gaming media are "indexes" of global phenomena that are deeply bound up in the environmental concerns of "after ice," including game situations of loss of control, fragility, and isolation. Her chapter considers how a cultural form such as games, like the realist novel or a documentary film, can either enable or constrain a contested understanding of environmental change under the conditions of global warming. She contends that games pursue narratives that are often counterfactual and speculative, more akin to the genre conventions of science fiction, and thus make room for critiques based on experimental scenarios and futures. By equating climate action with prominent definitions of game play, such as "the voluntary overcoming of unnecessary obstacles," Chang asks us to make out how play is fundamental to crafting a shared future for cold in planetary experience.

Esther Leslie considers how a rapidly changing climate and cryosphere outstrip the pace of history, memory, and our cultural expectations. She surveys ice and cold in cultural productions, including Bertolt Brecht, *Mutt and Jeff*, Alexander Kluge, and Gerhard Richter. Does the instability of ice as an object provide a methodological lesson for our unpredictable age? Just as ice melts into water, so this volatility suggests metaphors of endless change. This also works in temporal terms. For, after the cryosphere as we know it is gone, perhaps what we are left with is ice as an exotic memory and "afterthought."

Leslie draws on Theodor W. Adorno and Alexander Kluge as theorists of the cold indifference of capitalist society. Each of these theorists produced an enormous body of work, though Kluge is less well known to Anglophone readers. Adorno anchored the tradition of the Frankfurt School before the Second World War and Kluge extended its critical theory to filmmaking and literature in the postwar period. Once called the German Godard, Kluge was a member of the New German Cinema, and won numerous awards for films such as *Yesterday Girl* and for short stories and poetry. He founded German studios and production companies and continued to actively produce films into the 1980s.[43] Leslie focuses particularly on Kluge's interest in metaphors of coldness, introduced by his literary titles such as *December*, a book of poems illustrated by Gerhard Richter, and his collaboration on the long-term effects of coldness with the poet Ben Lerner, *The Snows of Venice* (2018).[44] Kluge engages with the art and images of ice as both terrifying and romantic, as a frozen archive of events and effects. As Leslie asks, "What is possible for its afterlife on the basis of its material qualities and its historical imbrications?" After ice implies a flawed, fraught future.

With climate warming, as Jeff Diamanti notes in his chapter, the background of human history has become the foreground. He proposes a materialist political ecology and performance theatre of melting glaciers, reflecting on moraines as the deposited remnants of glaciers, an index of melt and the material history of the glacier. Using the case of the Sermeq Kujalleq Glacier in Ilulissat, he reflects on the status of Greenland as a site of anthropogenic climate change caught by multiple forms of media representation such as satellite photos, magazine covers, and ice cores. In an attempt to capture the contradictions evident at such sites and in these representations, he adopts Edward Said's notion of a contrapuntal vision. This sees the history of industrial capitalism imbricated within melting ice. This chapter chronicles attempts by video and performance artists to engage with and represent the epochal changes occurring in Ilulissat. Diamanti concludes that a relational approach is vital if we are to understand the multiplicity of global climate warming and the local effects of the melting cryosphere. He introduces the notion of "enjambment" or jamming up and altering the situation as a methodological approach to animated objects such as glaciers and to an ecology in flux.

Zsolt Miklósvölgyi and Márió Z. Nemes consider the rhetorics and metaphorical use of "hibernation" as not only a state and technology but also an ecology of meanings concerning frozen bodies such as crystallized water. This also concerns flows and passages, mobility and fixity, such as in the idea of hibernation as preservation and archiving, slowing aging and time itself. There is a certain paranoia about loss that drives preservation and a certain fear for the future of the cryosphere that captivates our attention. Cryopreservation, they note, implies a cryopolitics and a cryoethics. They consider discourses on climate change beginning with the work of Fernand Braudel, who speculates on the relationship between historical, social, and climate change. They then move to more contemporary sources that consider the closure of this gap between the social and the natural worlds so that we come to see ourselves as directly involved and affected by our environment. This again implies a relational approach, although Miklósvölgyi and Nemes see this as a matter of hauntings that so trouble the relationship between life and death that humanism faces a paradigmatic challenge.

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The three sections work in concert to chart the relationships between the phase transitions of water that coalesce in ice and an array of human activities, effects, and phenomena – a spectrum that we summarize in the

term "cold humanities." To be "after ice" is not to leave it behind as a phase transition of matter; rather, it is to be set in relation with a long (cold) chain of ways of being, understanding, manipulating, and using ice. The cold humanities demonstrate how settler colonial claims to ice still reverberate today. Despite its apparent solidity, ice has never been a static phase of matter. Dependent on ambient temperatures, it is always in flux. This collection highlights the narrative work performed by humans to make claims on ice and cold: claims that demand further attention and analysis through the cold humanities.

This collection makes claims on the positionality of ice and the politics of its mediation as a cold knowledge. We seek ways of supporting a more just form of polar thought that embeds southern accountability within northern experiential conditions and calls for Indigenous sovereignty. We highlight southern societies' dependency and commitment to ice as an unstable materiality that depends on physical chemistry and nonlinear cultural praxis that are subject to carbon-based warming. That there is an ethics of engagement across all three claims is self-evident – cool is a spectrum of social and temperature conditions that also demands careful cultural definition. As Jody Berland notes in comparing challenging weather to noise: "Bad weather is weather that makes itself audible, that introduces noise to the body's interface with the world, that threatens to demolish the disciplines of everyday routine with no reason or need to explain."[45] For communities such as Upernavik, weather challenges are the new norm. *After Ice* is one response to this southern projection of the phase transitions of water.

NOTES

1 Core Writing Team, Hoesung Lee, and José Romero, eds., "Summary for Policy-Makers," in *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (Geneva: IPCC), 1–34. https://www.ipcc.ch/report/ar6/syr/.

2 Mark Nuttall, "Icy, Watery, Liquescent. Sensing and Feeling Climate Change on North-West Greenland's Coast," *Journal of Northern Studies* 13, 2 (2019): 71–91. The issue of *Journal of Northern Studies* and the present volume have their origins thanks to postdoctoral research and a symposium in 2018 sponsored by the University of Alberta Tory Chair, Department of Sociology; UAlberta North; the Government of Canada's Banting Postdoctoral Fellowship Program; and the Social Sciences and Humanities Research Council of Canada's Communication Grant Program.

3 Nicole Starosielski, "The Materiality of Media Heat," *International Journal of Communication* 8 (2014): 2504.

4 For their case against declensionist narratives of polar decline, see Klaus Dodds and Jen Rose Smith, "Against Decline? The Geographies and Temporalities of the Arctic Cryosphere," *Geographical Journal* 189, 3 (2023): 388–97.
5 Jennifer Gabyrs, "Plastiglomerates and Speculative Geologies," February 20, 2020, https://www.jennifergabrys.net/2014/10/plastiglomerates-speculative-geologies/.
6 Sverker Sörlin, "Cryo-history: Narratives of Ice and the Emerging Arctic Humanities," in *The New Arctic*, ed. Birgitta Evengård, Joan Nymand Larsen, and Øyvind Paasche (Cham, Switzerland: Springer, 2015), 327–39; Sverker Sörlin, "The Emerging Arctic Humanities: A Forward-Looking Post-Script," *Journal of Northern Studies* 9, 1 (2015): 93–98.
7 Marcus Nüsser and Ravi Baghel, "The Emergence of the Cryoscape: Contested Narratives of Himalayan Glacier Dynamics and Climate Change," in *Environmental and Climate Change in South and Southeast Asia: How Are Local Cultures Coping*?, ed. Barbara Schuler (Leiden: Brill, 2014), 138–56.
8 Peder Roberts, Adrian Howkins, and Lize-Marié van der Watt, "Antarctica: A Continent for the Humanities," in *Antarctica and the Humanities*, ed. Peder Roberts, Lize-Marié van der Watt, and Adrian Howkins (London: Palgrave Macmillan, 2016), 1–23.
9 Philip Steinberg, Berit Kristoffersen, and Kristen L. Shake, "Edges and Flows: Exploring Legal Materialities and Biophysical Politics of Sea Ice," in *Blue Legalities,* ed. Irus Braverman and Elizabeth R. Johnson (Durham, NC: Duke University Press, 2020), 85–106.
10 This approach distinguishes it from Klaus Dodds's call for an "ice humanities."
11 Nigel Clark draws a parallel between out of control planetary fire and human attempts to contain fire through the internal combustion engine; see "Infernal Machinery: Thermopolitics of the Explosion," in "Thermal Objects," ed. Elena Beregow, special issue, *Culture Machine* 17 (2018), https://culturemachine.net/vol-17-thermal-objects/infernal-machinery/. See as well Stephen Pyne, *Fire in America: A Cultural History of Wildland and Rural Fire* (Princeton, NJ: Princeton University Press, 1982).
12 Nicole Starosielski, "Thermocultures of Geologic Media," *Cultural Politics* 12, 3 (2016): 293–309.
13 See, for example, Astrida Neimanis, *Bodies of Water: Posthuman Feminist Phenomenology* (London: Bloomsbury Academic, 2017); Elizabeth DeLoughrey, "Shipscapes: Imagining an Ocean of Space," *Anthurium* 16, 2 (2020): 1–12.
14 For an assessment of how this affected the southern hemisphere, and Australia in particular, see Ruth A. Morgan, "The Continent without a Cryohistory: Deep Time and Water Scarcity in Arid Settler Australia," *Journal of Northern Studies* 13, 2 (2019): 43–70.
15 Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Cambridge, MA: Harvard University Press, 2013), 13.
16 Michael Bravo and Gareth Rees, "Cryo-politics: Environmental Security and the Future of Arctic Navigation," *The Brown Journal of World Affairs* 1, 13 (2006): 205–15.
17 Joanna Radin and Emma Kowal, "Introduction: The Politics of Low Temperature," in *Cryopolitics: Frozen Life in a Melting World* (Cambridge, MA: MIT Press, 2017), 6.

18 Radin and Kowal, "Introduction," 9–10.
19 Michael Bravo, "A Cryopolitics to Reclaim Our Frozen Material States," in *Cryopolitics: Frozen Life in a Melting World,* ed. Joanna Radin and Emma Kowal (Cambridge, MA: MIT Press, 2017), 37.
20 Jen Rose Smith, "'Exceeding Beringia': Upending Universal Human Events and Wayward Transits in Arctic Spaces," *Environment and Planning D: Society and Space* 39, 1 (2021): 52.
21 Igor Krupnik, Claudio Aporta, Shari Gearheard, Gita J. Laidler, and Lene Kielsen Holm, *SIKU: Knowing Our Ice; Documenting Inuit Sea Ice Knowledge and Use* (Dordrecht: Springer, 2010).
22 Eve Kosofsky Sedgwick, "Introduction," in *Touching Feeling: Affect, Pedagogy, Performativity* (Durham, NC: Duke University Press, 2003), 8, 14–15.
23 Sheila Watt Cloutier, *The Right to Be Cold: One Woman's Fight to Protect the Arctic and Save the Planet from Climate Change* (Minneapolis: University of Minnesota Press, 2018).
24 "*Pinngortitaq* – refers to all that has come into existence (not just 'environment'); all that is around, above, below, underneath and within, and which is still taking shape; always coming into being, forming and reforming"; Nuttall, "Icy, Watery, Liquescent," 77–78.
25 Eli Kintisch, "The Great Greenland Meltdown," *Science*, February 23, 2017; http://www.sciencemag.org/news/2017/02/great-greenland-meltdown.
26 Mark Nuttall made this observation, in conversation with Rafico Ruiz, over the course of "Unnatural Resource: The Stories People Tell about Polar Environments," Conversations North, University of Alberta, November 1, 2017.
27 Cited in Avery Slater, "Fossil Fuels, Fossil Waters: Pipelines and Indigenous Water Rights," in *Saturation: An Elemental Politics*, ed. Melody Jue and Rafico Ruiz (Durham, NC: Duke University Press, 2021).
28 Salazar and O'Reilly, Chapter 5 in this volume.
29 Maud Barlow, *Our Water Commons: Toward a New Freshwater Narrative* (Ottawa: Council of Canadians, n.d.), https://www.blueplanetproject.net/documents/water%20commons%20-%20web.pdf.
30 Cited in Barlow, *Our Water Commons*, 6.
31 Josh Willis, Eric Rignot, R. Stephen Nerem, and Eric Lindstrom, "Introduction to the Special Issue on Ocean-Ice Interaction," *Oceanography* 29, 4 (December 2016): 19.
32 Hans-Otto Pörtner, Debra C. Roberts, Valérie Masson-Delmotte, Panmao Zhai, Melinda Tignor, Elvira Poloczanska, Katja Mintenbeck, Andrés Alegría, Maike Nicolai, Andrew Okem, Jan Petzold, Bardhyl Rama, and Nora M. Weyer, eds., *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate,* IPCC 2019, https://www.ipcc.ch/srocc/download-report/.
33 Julie Cruikshank, *Do Glaciers Listen? Local Knowledge, Colonial Encounters, and Social Imagination* (Vancouver: UBC Press, 2005).
34 See Melody Jue and Rafico Ruiz, "Time Is Melting: Glaciers and the Amplification of Climate Change," *Resilience: Journal of the Environmental Humanities* 7, 2–3 (2020): 178–99.

35 See, for example, Robert G. David, "The Ice Trade and the Northern Economy, 1840–1914," *Northern History* 36, 1 (2000): 113–27; Terje Finstad, "Cool Alliances: Freezers, Frozen Fish and the Shaping of Industry-Retail Relations in Norway 1950–1960," in *Transformations of Retailing in Europe after 1945*, eds. Ralph Jessen and Lydia Langer (Surrey, UK: Ashgate Publishing, 2012), 195–210; Jonathan Rees, *Refrigeration Nation: A History of Ice, Appliances, and Enterprise of America* (Baltimore, MD: Johns Hopkins University Press, 2013); Paula Schönach, "Natural Ice and the Emerging Cryopolis: A Historical Perspective on Urban Cold Infrastructure," *Culture Machine* 17 (2019): 1–25; Nicola Twilley, "The Coldscape: From the Tank Farm to the Sushi Coffin," *Cabinet* 47 (Fall 2012); http://www.cabinetmagazine.org/issues/47/twilley.php.

36 David Seed, *American Science Fiction and the Cold War: Literature and Film* (London: Routledge, 1999).

37 IIF-IIR, D. Coulomb, J.L. Dupont, and A Pichard, *The Role of Refrigeration in the Global Economy*. 9th Informatory Note on Refrigeration Technologies (International Institute of Refrigeration, 2015), http://www.iifiir.org/userfiles/file/publications/notes/NoteTech_29_EN.pdf

38 Bravo, "Cryopolitics to Reclaim," 43.

39 Tania Murray Li, "What Is Land? Assembling a Resource for Global Investment," *Transactions of the Institute of British Geographers* 39, 4 (2014): 589.

40 Rafico Ruiz, *Phase State Earth: Ice at the Ends of Climate Change* (Durham, NC: Duke University Press, forthcoming).

41 Rees, *Refrigeration Nation.*

42 Elizabeth M. Deloughrey, *Allegories of the Anthropocene* (Durham, NC: Duke University Press, 2019), 4.

43 Alexander Kluge and Oskar Negt, *History and Obstinacy* (New York: Zone, 2014); Alexander Kluge and Oskar Negt, *Public Sphere and Experience: Toward an Analysis of the Bourgeois and Proletarian Public Sphere* (New York: Zone, 2014).

44 Alexander Kluge and Gerhard Richter, *December: 39 Stories, 39 Pictures* (New York: Seagull Books, 2012).

45 Cited in Jonathan Sterne and Dylan Mulvin, "Introduction: Temperature Is a Media Problem," *International Journal of Communication* 8 (2014): 2498.

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