

SCENES OF TRANSVALUATION IN THE CRYOSPHERE

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The cryosphere is a paradoxical domain, at once a geological archive where the history of the planet is frozen and preserved as though primed for an objective study, and at the same time it is a transient terrain that is subject to the discursive framing of climate change and other modes of political ecology. It is therefore a terrestrial ground on which a reconsideration of the industrial history of capitalism leading to global warming is taking place. But because it is a ground that is dynamic—indeed, because it is melting—the cryosphere prompts a rethinking of the production of climate knowledge.

As they study the ice, glaciologists and climate scientists encounter the political investments, cultural and labor histories, and postcolonial struggles of circumpolar Inuit communities. These encounters are also confrontations with value (use-value, surplus value, and exchange-value), and might be seen in terms of a paradigm shift from the toxic era of the Anthropocene to a more self-reflexive mode of existence, or what Bernard Stiegler describes as a “Neganthropocene.”¹ In this article, I consider the emergence of the cryosphere as the site at which such a transvaluation of value is possible. I connect this transvaluation to Stiegler’s concept of “negentropy.” Stiegler’s analysis of the Anthropocene rests on his characterization of this era as part of a systemic movement towards a *totalizing end* in energetic collapse. The Anthropocene is not simply an epoch that was technologically determined; it is an epistemic crisis underwritten by the perpetual loss of energy, or entropy. It is the outcome of a thermodynamic machine that originated in the Industrial Revolution, and which has so commanded all forms of organization, from the social to the technical to the ecological, that its metabolic perturbations anticipate and condemn the futurity of life. The entropy of this episteme can only be countered by reversing its trajectories through processes of negentropy, a reassembly of energy, creativity, information, and will that would counter the Promethean paradigm by which energy is harnessed and then expended, and the matrix of ecological organizations left to exhaustion.

Negentropy, and its corollary mode of reflexive thinking, *neganthropology*, allow for a transition into a new epoch, the Neganthropocene.

In what follows, I discuss four scenes of ice from West Greenland to consider the entropy and negentropy acting upon and through the cryosphere: the geo-assemblage, glaciology, a performance by Greenlandic artist Jessie Kleemann, and, finally, a political organization called *Pikialasorsuaq* that governs the North Water Polynya in Baffin Bay. To suggest that we might locate processes of transvaluation in *scenes* of ice is to suggest something of the fundamental transformation at play in the cryosphere. I posit that glacier melt is an ecological *expression*, and must therefore be read not only through a techno-scientific lens, but also epistemologically, aesthetically, and by abiding with cultural specificity. It is in this sense that processes of negentropy also require anthropological reflection, or what Stiegler calls *neganthropology*. Glacier ice can be analyzed in multiple modes: studied for observable information about environmental change, but also as an actant that transforms and is transformed by lived conditions and the ways such conditions are culturally interpreted. Melting glacier ice has exchange-value for scientists, local communities of the Arctic, politicians, corporations, and the art world, whether as a knowledge commodity, an affectively charged materiality, or a resource commodity (water for mining or bottled water). Yet it is also an actant that can be read “crookedly” (to use Bruno Latour’s term); it has the potential to transform the procedures of its own exchange.²

I will consider how epistemological gaps in the production of climate knowledge demand further consideration of the expressivity of the cryosphere and the ways it elicits new forms of relationality. To establish the cryosphere as a site of transvaluation, I return to Karl Marx’s understanding of the transvalue of use-value, suggesting that Marx allows us to rethink ecological entanglement across knowledge objects, aesthetic experience, and the systemic operations of industrial capitalism. It is precisely this alternative movement of transvalue that permits us to see how ecology demands alternative forms of observation as operations of transvaluation in their own right. In other words, the observation of ice as planetary expression, and across epistemic positions (across the epistemes of science, art, and Inuit knowledge), is a crucial form of transvaluation.

However, it is precisely in attempts to counteract the momentum of entropy, and its capitalist rationale, that the challenges of transvaluation

become evident. Entropy not only obscures the lens through which climate conditions are viewed, but also constitutes that lens and expresses itself through the technics of observation. In other words, the diminishing returns of capitalism intercede on our capacity to see climate change through alternative and transvaluing epistemes. It is therefore essential to examine both the lens and the object of study in the constitution of the cryosphere, as well as its potential to prompt the transitivity of value. If we read capitalism's entropy by way of its systemic ecological expression, it becomes possible to see and interpret the ways entropy intervenes on the *protention*, or carrying forward, of knowledge, as per Stiegler's analysis. Further, it becomes possible to disarticulate knowledge from its tendency to extract energy from its object of study (the entropic drive of knowledge production), and to embrace the transvaluation of value enabled by reconsidering the mediation of ice in geo-aesthetic terms.

The Transvalue of Use-Value: Second-Order Labor System as Negentropy

In his description of the production of surplus value, Marx characterizes labor as both a living sphere of production—an organism—and an energy—a consuming fire that transforms materials and destines their function. In *Capital*, Chapter 7 section 1, “The Production of Surplus Value,” Marx writes:

Whether a use-value is to be regarded as raw material, as instrument of labour, or as product, this is determined entirely by its function in the labour-process, by the position it there occupies: as this varies, so does its character... Iron rusts and wood rots. Yarn with which we neither weave nor knit, is cotton wasted. Living labour must seize upon these things and rouse them from their death-sleep, change them from mere possible use-values into real and effective ones.³

Here, material, tool, and product are forged in the fires of “living labor.” They are also defining functions of a consuming labor process. Marx continues:

Bathed in the fire of labour, appropriated as part and parcel of labour's organism, and, as it were, made alive for the performance of their functions in the process, they are in truth consumed, but consumed with a purpose, as elementary constituents of new use-values, of new products, ever ready as

means of subsistence for individual consumption, or as means of production for some new labour-process... Labour uses up its material factors, its subject and its instruments, consumes them, and is therefore a process of consumption.⁴

The labor system is not merely a first-order system in which labor (energy) is applied to materials, yielding their use-value to generate a product. More precisely, it is also a second-order system in which the use-value of material, instrument, and product doubles as *transvalue*, which enables the expansion of the system itself. It is this doubling of use-value as transvalue that lends labor its alchemical power. The transitivity of value endows labor with the character of energy consumed by an organism in an environment, whereby the entire assemblage of the laborer's body, tools, materials, and labor force (i.e., the "means of production") operates in concert to generate an energy exchange by which the system lives and expands. The labor process that produces use-value also auto-produces the power of transvalue through the recursive incorporation that takes place between the product and the laborer's body within the labor system. In Marx's words, "The process disappears in the product, the latter is a use-value... Labour has incorporated itself with its subject: the former is materialised, the latter transformed... The blacksmith forges and the product is a forging."⁵

Marx's formulation of transvalue specifies a bi-directional coextensiveness between materials (transformed through labor, which in turn transforms the laborer), instruments (which transform materials into products through labor, and transform labor into a product in and of itself), and the laborer (whose energy produces use-value and gleans use-value, to and from materials and instruments). The Earth here is both the "original larder" and the "original tool house" for the laborer's body; taken together, they constitute a value-producing and value-internalizing planetary system.⁶ Marx's outline of the means of production thus invokes the self-organization of the value production process: the system of value-production effects the use-value of the system.

Because labor takes place in and through the consumption of fiery energies, Bernard Stiegler suggests reading Marx in the service of ecology by addressing labor's integration into a thermodynamic system of perpetually diminishing returns.⁷ His recharacterization of the Anthropocene as the "Entropocene" (the age of entropy) suggests that the origin of anthropogenesis is to be found in the technological harnessing of fire exemplified by the steam engine. Combustion—the process by which engines convert and consume

energy—is the broader form of systemic entropy that has brought about ecological disequilibria. Stiegler argues, “The question of fire—that is, of combustion—is thus inscribed in the perspectives of both physics and ecological anthropology, at the heart of a renewed thought of cosmos *qua* cosmos.”⁸ For Stiegler, fire commands inventiveness and the domain of futurity; it travels at light speed illuminating the trajectory of thinking. The regime of combustion thus governs the protention (the carrying-forward) of thinking into the future.

If the Anthropocene’s distinguishing drive is combustion—the entropic loss of energy and life—it becomes necessary to countervail it with processes of *negentropy*. Such a logic requires its own form of inquiry, which Stiegler terms a *neganthropology*, an anthropology of the technological seizure and expenditure of fire’s energy. He calls for reflection on the scene of value production, and its transitive potential to reverse the entropic loss of energy. This neganthropology would intervene on the seeming inevitability of the Anthropocene’s hold on life through the energy system of labor. In proposing a neganthropology, Stiegler thus challenges sweeping narratives that purport to hold a geological perspective by questioning the artifice of fire (a point to which I will return).

Stiegler’s return to Marx is important for rethinking climate change in the following three ways. First, in considering the relationship between labor and the Earth through the terms of transvaluation (whether entropy or negentropy), it becomes possible to see how Marx anticipates the concept of the *geo-assemblage* in ways that enable critical interventions into the political ecology of climate change. Second, one might make such an intervention by showing how transvaluation is a possible outcome of geo-assemblages that currently mediate the cryosphere. The geo-assemblage is not merely a rendering of techno-scientific knowledge as a product, nor a discrete mediation of climate change, but rather an intervention into the possible entropy of glaciology. In other words, glaciology need not be merely the study of glacier melt (the inevitable expenditure of energy due to global warming), but might rather be a neganthropology of ice as a planetary expression read through an alternative, non-entropic episteme. Third, where Marx originally conceives of the labor system as fiery transformation that inaugurates an epoch ruled under the sign of Prometheus, it is important to rethink how transvaluation occurs in and through glacier ice, and as I will later embellish, under the sign of Sedna.

In other words, I address the cryosphere as a prime site and system in which the transvaluation of contemporary climate change and its entropic labor takes place.

Marx argues, “It is not the articles made, but how they are made, and by what instruments, that enables us to distinguish different economic epochs.”⁹ In this vein, I am positing a two-fold argument: the cryosphere is a labor system that *produces* glacier ice, and this production articulates climate change as an expression of an economic epoch. This is not to suggest that climate change is an economic rather than an ecological phenomenon, but rather to foreground, as Jason W. Moore does in his conceptualization of the “Capitalocene,” that the specific economic organization of a historical period is constitutive of its ecology.¹⁰ Following Moore, I suggest that the cryosphere is a site where we might observe the economic instruments that produce ice, and where we might consider how other mediations, representations, and interventions on ice chart a neganthropological pathway to understanding diverse human relationships with ice. In other words, the cryosphere is the site where an emergent Neganthropocene is underway.

The Production of the Cryosphere as Geo-Assemblage

The cryosphere designates the frozen areas of the planetary surface, including the polar ice sheets, their surrounding ice caps, glaciers, permafrost, and the seasonal formation of sea ice. It is neither a singular place nor a stable object, but rather a distributed topographic domain subject to seasonal shifts, periods of geological expansion and contraction (for example, during an ice age), and, since 1997, accelerated melt due to rising global temperatures.¹¹ The Greenland Ice Sheet is an exemplary object of the cryosphere. It is the second largest planetary mass of ice, and it is currently being studied by glaciologists and other climate scientists for the variability in its surface mass balance. The melt of Greenland’s ice sheet is a concern not only because it indexes warming temperatures, but also because it is a predictor of positive feedback loops and ice behaviors such as calving, surface imbalance, and sea rise due to meltwater at glacier terminals.

The concerns of the cryosphere vis-à-vis climate change are manifold. However, they are not always what one might expect. While glaciers are considered endangered entities subject to extinction, and therefore often painted with the same brush as endangered animal species, this framing

of ice perhaps obscures the robustness of the cryosphere and its dynamics of growth and melt. For example, the Ilulissat Ice Fjord, which flows from the Greenland Ice Sheet, was designated a UNESCO World Heritage Site in 2004. While the Ice Sheet and surrounding ice caps have been melting and receding at an accelerated pace, and at unprecedented rates since the late nineties, there is not such a shortage of ice that the Ice Sheet must be protected through techniques of conservation. In fact, the Greenland Ice Sheet ranges from roughly one to two miles thick and covers an area three times the size of Texas (660,000 square miles). From year to year the density of the Ice Sheet can increase depending on snowfall and the relative accumulation or loss of the firn layer, a buffer zone that insulates the sheet from fluctuating air temperatures. Though meltwater runoff transforms the coastal townships of West Greenland annually, glacier melt cannot be subsumed by the concept of extinction as easily as plant, animal, and insect species can. The Greenland Ice Sheet is a variable entity whose glacier terminals demonstrate idiosyncratic and often unpredictable behaviors.¹²

It would seem that glacier melt is a primary symptom of climate change, but it is also one that situates Greenland as a potentially resource-rich nation in the brave new world of climate change. The volume of water issuing from Ice Sheet runoff positions Greenland to profit from new hydrological commodities, such as bottled water, as well as a seemingly infinite natural supply of water for water-intensive mining.¹³ The Ice Sheet is primed to become a resource for what Moore calls “Cheap Nature.”¹⁴ Moreover, the exposed moraines of glacier terminals yield new earth materials, such as glacier rock flour, discovered by geologist Minik Rosing to be a rich fertilizer that can be used for crops in South America.¹⁵ But the development opportunities unlocked by the melting Ice Sheet do not account for the more complex behavior of the cryosphere and its effects on livelihoods in the Arctic. The annual decrease in sea ice formation has meant numerous changes in the hunting territories of the Arctic Inuit. As Shari Fox has argued, sea ice is the linchpin of Arctic life—not only for hunters who need it for transport by dog sled or Skidoo, but also for whole communities for whom decreasing sea ice means going out on the land less frequently and therefore changing the seasonal patterns that bind families and relationships.¹⁶ Changes to animal migration patterns and physiology are likewise producing secondary effects such as compromised sealskins and unpredictable hunting routes.¹⁷ These changes, coupled with the European Union’s 2009 ban on the seal trade, have meant

the exertion of a set of political, economic, and environmental pressures on Arctic Inuit that destines them to choose between increased poverty, new forms of resource development, or some combination of the two. In other words, glacier melt appears to be an encompassing form of climate change entropy that makes further precarity a seemingly inevitable outcome.

Although the history of the Arctic was shaped by colonial expeditions, which plundered resources and occupied the coasts with European, American, and ultimately Danish settlements, such vying for territory has given way to new social, political, and ecological dynamics. Greenland still struggles in the wake of Danish colonial paternalism and polar geopolitics that, in recent decades, have significantly changed the terrain of resource-based power. Yet Greenland achieved home rule in 1979 and self-government in 2008, and it has so far resisted becoming a global resource provider of oil and rare earth minerals, despite facing pressure from multinational companies speculating for both. Though environmentalist discourses of glacier ice precarity might invoke an impetus to conserve ice and Inuit livelihood under the same rubric, the Greenlandic cryosphere is by no means a threatened wilderness that can be subsumed by the lens of colonial science and exploration.

Indeed, anthropologists Klaus Dodds and Mark Nuttall characterize Greenland's ecological predicament somewhat differently. On the one hand, Greenland appears to be vulnerable to a postcolonial "scramble" for resources on the part of global powers. Yet Dodds and Nuttall nevertheless situate Greenland in a dynamic nexus of pressures, actors, and forces that they term a *geo-assemblage*.¹⁸ Importantly, geo-assembly can be understood as both the nexus and the practice of interpretation by which materialities, objects, and networks of knowledge are understood in their emergence, circulation, and at times their collapse. In other words, geo-assembly names both a complex of relations and a discipline of reading these relations through one another. Narratives of geo-assembling are thus an enactment of the geo-assemblage. The anthropology of the ways relationships are geo-assembled in Greenland is its own practice of geo-assembling that invigorates an alternative framing of environmental relations. Dodds and Nuttall thereby forge an example of neganthropology as Stiegler would have it.

As Dodds and Nuttall narrate Greenland through the activity of geo-assembling, they uncover new narratives of liveliness and collectivity, as well as alternative understandings of environmental sustainability that include local and global actants. They argue for a heterogeneous and materialist understanding

of sustainability in Greenland, in contrast to the social and spatial models of sustainability inherited from the colonial administrators and postcolonial governments of Greenland prior to its transition to self-government in 2008.¹⁹ They offer a comparison between a colonial conception of the cryosphere in Greenland and a more complex conception of sustainability that geo-assembles in and through the formation of sea ice in transnational waters. The historic relationship between Denmark and the United States military reinforced Denmark's sovereignty over Greenland and secured its alliance with NATO during the Cold War period. In 1997, Dodds and Nuttall recount, Denmark released US Army documents from the 1950s on the *Strategic Value of the Greenland Icecap*. The reports included detailed plans for "Project Iceworm," a system of railroads designed to transport American nuclear missiles underneath the Greenland Ice Sheet 150 miles from "Camp Century" to the Thule Air Base in West Greenland.²⁰ The project never came to fruition, in no small part due to the instability of the ice. But the plans demonstrate how inland ice was understood strategically in relation to the reterritorialization that animated the relationships between global powers. During the Cold War, the Greenland Ice Sheet was mobilized to forge a "bilateral security relationship" by which the US entrenched Denmark's claim over Greenland by way of colonial protectionism, and the US deflected criticism that Denmark was not investing enough in military capability. This history predetermined environmental sustainability as the securitization of Greenland. The cryosphere was therefore positioned as a geological ground for the symbiotic relationship between colonial rule and global security. The stockpiling of destructive energies that animated the Cold War remains the primary rationale for this form of "sustainability."

However, Dodds and Nuttall read the emergence of a more complex form of sustainability through the "geo-assembling" that can be observed in connection with the variations in sea ice from year to year. In contrast to the militaristic and colonial mobilization of ice, they follow the shipping container through its passages of transport along the archipelago of West Greenland, reflecting on the social bonds it convenes, the dependency of settlements on its cargo, and the ways the supply chain is upheld in relation to the formation of sea ice. They argue, however, that the sustainability of this geo-assemblage enabled by sea ice is subject to breakage due to climate change. The presence and movement of sea ice is therefore the material expression of sustainability. Here, Dodds and Nuttall make a crucial distinction between the colonial spatial paradigm of the Cold War and the

geo-assembling of communities convened around sea ice that must be read through the relative mobility and immobility of the shipping container.

The geo-assemblage highlights the transitive dynamics of value at stake in charting the concerns of ice. The detailed plans for Project Iceworm, understood in the context of the Cold War, present what Stiegler calls a “geocratic” perspective by which ice was mobilized as a terrestrial formation to shelter the stockpiling of missiles and to anchor the tactical positions of nation-states and their colonies in preparation for a massive expenditure of energy (nuclear war).²¹ But Dodds and Nuttall cultivate a sensibility for the transvaluation of ice as an elemental condition that sustains communities, transport, sea life, and Greenlandic independence. From their analysis, it becomes clear how energy systems that have led to climate change threaten the more subtle vectors that constitute the lively activity of geo-assembling with sea ice. Sea ice nevertheless persists as a site of transvaluation that resists the momentum of colonial entropy. Yet climate change, as an extension of the imperial industrial episteme, perturbs the formation of sea ice and the many relations it sustains.

The Mediation and Protention of Ice Towards a Neganthropology

If sea ice is a dynamic but nevertheless crucial component of a neganthropological interpretation of the cryosphere, the ice core sample is its counterexample. Ice core sampling is one of several forms of glaciological monitoring that produces climate data. An ice core is procured by drilling miles into the ice sheet and extracting a cylindrical cross section. The ice core contains pockets of carbon dioxide that contain a wealth of information about climate conditions spanning from decades to hundreds of thousands of years ago. Ice core archives are the principle means by which scientists measure climate change variability, and thus periodize carbon emission-based global warming. Core sampling is expensive—labor- and equipment-intensive—and often undertaken in situ to maintain the samples in sub-zero temperatures. Otherwise, core samples are transported and stored in one of only a few global ice core facilities. Yet the extraction of glaciological data, and its use in the production of a global discourse of sustainability, inherits a colonial and military history and infrastructure of knowledge exchange. The tendency of ice core sampling to position the cryosphere as endangered, and

as an archive of the planet's climate history, implicates its scientific instruments in a broader history of colonial labor and energy depletion.

Glaciology is a proliferating science with dozens of emerging specializations. It would seem to represent the persistence of the historic authority of science. Yet the ice core, as a prime sample studied by glaciologists, is rooted in a paradigm and a topology determined by flows of human activity, epistemological relationships, and geological survey media. The scientific knowledge of ice that informs claims regarding climate change is produced through remote sensors, satellite imaging, and a continuous flow of data between research groups, all of which contribute to a perspective of the cryosphere in its transformation. The mediation of ice is geared towards isolating an important periodization of climate change (the date at which human-based climate change can be said to have had a causal effect on glacier melt). It also informs efforts to model the surface mass balance of the Greenland Ice Sheet so that glaciologists can predict its behavior through detailed comparisons of the relationship between winter snowfall and summer runoff.²² Yet while it is a highly mediatized science, glaciology continues to develop modalities of knowledge production, increasingly in collaboration with Arctic Inuit communities.

The technological mediation of ice perhaps obscures the transitive potential of glaciology. In the same way that Marx observes that “the blacksmith forges and the product is a forging,” one might say that the glaciologist observes, and the product is glaciological observation. Or, with greater sensibility for the scientific instrumentation, the glaciologist mediates, and the product is a glaciological mediation of the cryosphere. But insofar as glaciology produces knowledge of ice, its production is two-fold. Not only does glaciology mediate ice as it produces scientific knowledge, it also produces scientific knowledge itself as a mediation of planetary observation. Glaciology studies ice and delivers its mediation as an integral part of its production. Ice is discursively framed by the life sciences in relation to the ways it preserves and nourishes biodiversity. Yet we might ask, via Stiegler, whether the production of glaciology fortifies the geo-assembling of sustainable communities that depend on ice, including Inuit communities along the west coast of Greenland, or whether it depletes them in its production of knowledge. How does glaciology's observation of ice anticipate future relations, communities, dependencies, and vitalities through ice? Or is the threat of climate

change so total that it forecloses any observation and anticipation of such geo-assembling? What are the possibilities for a neganthropology of ice under the conditions of climate change?

Art historian Birgit Schneider analyzes scientific diagrams illustrating the effects of climate change in global maps. She suggests that the recurrent use of red tones to convey warming temperatures has a history in the *cosmogram*: imagery of the planet under the duress of apocalyptic heat, fire, and destruction.²³ Climate cosmograms “materialise and visualise the worldview of the Anthropocene” in the production of a fictional yet possible future.²⁴ Schneider recognizes that the key failure of the burning world cosmograms is their alarmist use of color, which appears as a distorted attempt to represent the potential impacts of climate change in the future rather than as factual conditions in the present. While the color red has frequently been used to denote warmth within visual media for centuries, in Schneider’s view the use of red in diagrams submitted to the Intergovernmental Panel on Climate Change is conspicuously charged and lacks a certain level of scientific objectivity, while it nevertheless discloses a fundamental concern with global warming and its effects. The covert visual history of cosmograms, which has unknowingly found its way into scientific diagrams and the representation of climate data, calls for a more sophisticated analysis of the images that represent the planetary condition.²⁵ The representation of the planet’s condition anticipates its future. One might further suggest that the cosmogram discloses the secret but obvious condition of scientists: they are living beings trying to create a worldview while at the same time registering and representing the very real danger they are in as they represent it. The neganthropological question might therefore become how to produce an image of a geo-assemblage that might intervene on the entropy of climate change from within its very conditions. How might glaciology reflect on its own conditions of representation while nevertheless anticipating the heterogeneous possibilities of the future?

In her analysis of the monitoring of the Pacific Garbage Patch, Jennifer Gabrys argues that sensing technologies have become an integral part of the mobile and traveling “society of objects” created by the aggregation of organic and inorganic materials in the ocean gyre.²⁶ Scientific speculation occurs in a processual system in which it informs the ocean environment, alongside plastic garbage and other debris, as much as it extracts information from this environment. Geo-speculation is therefore a sensing practice that concretes in a nexus of materialities to formulate a scaffolding

by which it makes sense of the environment. In a similar vein, we might consider how glaciology is not just a science but an episteme forged in the processual movement of mediatized ice observation. Glaciology produces an environmental infrastructure through which its knowledge production takes place. In other words, the observation of ice is both enabled and obscured by the instrumentation of glaciology. In its production of ice cores, glaciology produces facts, which serve as knowledge commodities that are stockpiled as an archive. But given the intensive mediation of ice through glaciology's apparatus of geo-speculation, one might nevertheless ask how its system of observation either consumes its own energies (specifically, how the scientific assemblage invests its energy into transforming both glacier melt and climate change discourse into a form of profit, thus re-confirming the authority of glaciology), or redirects its energies towards a perspective of climate change that invigorates the geo-assemblages that sustain and are sustained by ice. In other words, how might glaciology integrate a critical reflection of its own production of ice knowledge into its very processes of mediation?

For Stiegler, the protention of thought—the carrying forward of systemic thinking from memory into the future—is the site at which entropy becomes apparent as a co-extant technological and environmental condition. The speed of technical thinking makes the depletion of energy seem inevitable, such that entropy is entrenched in and through the production of technical knowledge, particularly predictive knowledge of the environment. Once integrated into a technical, psychic, and collective system in which thoughts have been mediatized in and through the environment, the depletion of that environment's energy appears to be a foregone conclusion. The concrescence of mediatized observation in the environment is not merely processual, but also anticipatory and causal: “It is what we are causing as the project of becoming that our... condition no longer allows us to succeed in trans-forming into a future.”²⁷ Stiegler characterizes this movement as a giant digital Leviathan that exerts its power over the entire Earth by penetrating the reticulation of thought (the ways in which we conceive of processes that have already transpired) and thus prefacing the ways of thinking forward.²⁸ According to this analysis, the production of digital information about ice would be a way in which we anticipate the future of the cryosphere through our technological formulation of it. Our knowledge of climate change therefore risks becoming a cause of climate change in its very obstruction of other possibilities of protention.

Stiegler suggests that it is only by intervening on the automaticity of this Leviathan through an “organology of will” that it becomes possible to intervene on the entropy of knowledge production.²⁹ Such a formation of collective will would recognize the bi-directionality of thinking in and through technical assemblages. Its intervention would be the selection of what knowledge is retained in order to pretend into the future. In this regard, Dodds and Nuttall’s sensibility for the complex geo-assemblages of sea ice would stand as a negentropic intervention in the exchange of knowledge. While fully attuned to the global apparatus that is mobilizing Greenland and its cryosphere, they redirect attention to a cross-disciplinary perspective of ice in such a way that glaciology is only one integrated facet of a system that is sustained through both local and global ecologies.

Ice Under the Sign of Sedna

Insofar as Stiegler calls for a neganthropology, a reflection on the relative depletion or invigoration of energy that takes place in the technical mediation of knowledge production, we might consider how the representation of the cryosphere in artistic practice offers a different perspective of geo-assembling, and how this perspective intervenes on the entropy of a colonial history of ice. Contemporary Greenlandic artists, for example, foreground a politicized and culturally specific sensibility for the ice. In so doing, they enact an alternative form of geo-assembling that intervenes on the totalizing and entropic discourse of climate change that would observe ice in isolation from the relations it sustains and the mediations by which it is measured. Greenlandic artist Jessie Kleemann’s performances have been read for their capacity to articulate the ambivalent colonial history connecting Greenland and Denmark.³⁰ Like other artists of her generation, such as Pia Arke and Niviaq Korneliusen, Kleemann enacts the fractured identities produced between a Greenlandic culture (and experience of place) and the intrusion of Danish paternalism. But Kleemann’s performances also introduce an emergent planetary sensibility by which Greenland’s cryosphere is expressed and sensed by way of myth.

In her performance, *Sassuma Arnaa* (“Mother of the Deep”) at the 2012 Liverpool Biennale, Kleemann animated a version of the myth of Sedna, the Inuit goddess of the sea.³¹ The legend of Sedna varies from region to region across the Arctic, but her story is essentially that of a young woman who refuses to be married. As the myth unfolds, Sedna is

tricked into a marriage agreement with a man who is secretly part fulmar (an Arctic sea bird). Although the man had promised the young woman that he was a successful hunter and would provide her plenty of food, when she arrived at her new home she discovered the truth about the birdman: not only was he not a hunter at all, but he only ate fish and his home was covered in smelly fish skins. When her father came to visit her and saw how unhappy she was, he killed the birdman and tried to bring her home in his kayak. However, the two were swarmed by a flock of vengeful fulmars. The birds beat their wings and stirred up the ocean until, terrified, Sedna's father flung her overboard as a sacrifice. When she clung to the edge of the boat, her father cut off her fingers all the way to their stumps. Her fingers sunk down into the ocean and became the sea creatures: walruses, seals, narwhals, and whales. The etymology of Sedna's Greenlandic name, Aiviliajok, has been traced to its roots *aiv* meaning "giving," *iliaq* to denote a temporal doing, *iaq* meaning "plenty," and *joq* "one who" to constitute the full connotations of the goddess and her function as "the one who periodically brings plenty of useful things."³² In times of duress, when Sedna is said to be angry, an Inuit shaman must turn into a fish and travel to the ocean underworld to clean and braid her hair since she cannot do it herself with her disfigured hands.

Over the course of the *Sassuma Arnaa* performance, Kleemann enacted different aspects of the Sedna myth. The performance was demarcated by hanging beakers of seal blubber and set to haunting vocals by singer Iben Mondrup and sound by Niels Lyngsø. Kleemann moved through the space, in and out of the crowd. Initially covered in a white textile, she covered her body and writhed underneath it to simulate metamorphosis. She eventually disrobed and heightened the facets of exposure, aggression, and abandonment that characterize the story of Sedna. Taking one viewer's glass of red wine, she poured it over herself to infer bloodshed. She then took a handful of ice cubes and painfully rolled them over her fingers, letting them fall to the ground in a gesture suggesting Sedna's dismemberment. In this way, Kleemann connoted the mechanism of sacrifice on which sea life and Inuit livelihood rely.

As art historian Kirsten Thisted argues, Jessie Kleemann's performances express the ambivalent position of Greenlanders, who were stigmatized by the colonial lens of the Danes and other Europeans who disdained Inuit practices of hunting and cooking, especially their use of pungent smelling blubber.³³ In the postcolonial era, there has been an impetus to counteract the colonial lens

and to affirm the beauty of Inuit identity with an embrace of the practices of drumming and dancing. Yet Kleemann's performances surface the more complex feelings of shame, loss, and inferiority that are the inheritance of the colonial view of indigeneity. Her performances are also vectors by which to view how the geo-assemblage of the cryosphere and its sustainability are interwoven with Inuit life, identity, and performative expression. *Sassuma Arnaa* not only retells the myth of Sedna; it calls on that myth as specifically relevant to the struggle for independence for Greenlanders, as well as their abandonment and disfigurement at the hands of colonialism.

As Kleemann exerts her body to animate the myth of Sedna and thereby demonstrate the postcolonial and ecological struggles of the Arctic Inuit, one can begin to imagine how the Inuit relationship with Sedna is at once an affirmation of the Inuit value system and a form of self-regulating energy exchange with its vital, icy underworld. Kleemann's performance represents as well as activates the materialities, mythologies, and postcolonial ecologies that inform the geo-assembling of the cryosphere. She provides an alternative modality of expressivity by which to visualize the complex relations that sustain and depend on Arctic ice and its inhabitants. In short, Kleemann invokes the historical perturbations of Arctic ice and undertakes their transvaluation under the sign of Sedna.

Conclusion: Pikialasorsuaq

I have argued that the cryosphere is the site of a rethinking of knowledge production itself, whereby anthropologists, glaciologists, and artists can be seen to undertake practices of transvaluation as they evaluate, mediate, historicize, and enact relationships that are forged in and through the ice. Though scientific observation produces its own mediation of the environment, the protention of glaciological knowledge is also mitigated with changing approaches to ice analysis, through concepts such as the geo-assemblage, which account for the relationships between material flows, local and global actants, and their social binding. As much as glaciology centers on concerns about climate change, melting glacier ice, and the diminishing formation of sea ice, the cryosphere must be conceptualized more broadly, since it is also lived and observed across systems of knowledge and experience. I would suggest that a performance like Jessie Kleemann's, which repositions ice through

myth, bodies, materials, and gestures, offers a glimmer of the possible cross-disciplinary and cross-cultural modalities at stake in neganthropological thinking.

The cryosphere, particularly in Arctic waters, is experienced, observed, and governed by the Inuit of Greenland and Canada, and by the cultural economy of their practices of geo-assembling. One might even suggest that such geo-assembling upholds the myth of Sedna's generosity. From this perspective, it becomes possible to understand how Greenlandic culture and forms of knowledge intervene on the use of environmental energies that were inherited from colonial and military practices. To conclude, then, I propose another Neganthroposcene of ice: *Pikialasorsuaq*.³⁴ This Greenlandic word means "the Great Upwelling," and refers to the area of Baffin Bay shared by Greenland and Canada. *Pikialasorsuaq*, also known as the North Water Polynya, is a diverse ocean microclimate that is seasonally surrounded by sea ice and home to narwhal, beluga, bowhead whales, walrus, and other land and sea life on which Inuit hunters rely.

The name "the Great Upwelling" calls forth the plenitude of life offered by Sedna's sacrificed fingers; it is an area animated by generations of stories and knowledge, as well as a sensibility for contemporary climate change. Currently, the North Water Polynya is being monitored by an international commission of Greenlandic and Canadian Inuit who consult with surrounding communities to oversee and report on its changing condition. *Pikialasorsuaq* is defined co-extensively as a political body, a scientific assemblage, and a transnational Inuit domain where sea animals are so plentiful that they burst forth from the water's depths and nourish the people who live from its transforming shores. *Pikialasorsuaq* observes sea ice in its plenitude while it oversees how the ice sustains relations, actants, and energy. Importantly, it does not simply observe ice or monitor the effects of climate change, though the commission is acutely attuned to these. More specifically, it protends into a sustainable future precisely through the way it understands relationships with the ice as its form of governance. Such a vision of ice redirects the economy of climate change that enforces a depleted and depleting perspective. Instead it sustains the vigor of these relations through a coextensive form of governance, mediated monitoring, and cultural representation.

NOTES

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- 2 Bruno Latour, *An Inquiry into Modes of Existence: An Anthropology of the Moderns*, trans. Catherine Porter (Cambridge, MA: University of Harvard Press, 2013), 126.
- 3 Karl Marx, *Capital Volume 1*, trans. Samuel Moore and Edward Aveling (Hertfordshire: Wordsworth Editions Limited, 2013), 124-125.
- 4 Ibid., 125.
- 5 Ibid., 122-123.
- 6 Ibid., 128.
- 7 Stiegler, *Neganthropocene*, 38-39.
- 8 Ibid., 40.
- 9 Marx, *Capital*, 122.
- 10 Jason W. Moore, "The Capitalocene, Part I: On the Nature and Origins of our Ecological Crisis," *The Journal of Peasant Studies* 44, no. 3 (2017): 595-630.
- 11 Brice Noël, Willem Jan van de Berg, J. Melchior Van Wessem, et al., "Modelling the Climate and Surface Mass Balance of Polar Ice Sheets Using RACMO2 – Part I: Greenland (1958–2016)," *Cryosphere* 12, no. 3 (2018): 811-831.
- 12 See "Greenland Ice Sheet Today," National Snow and Ice Data Center, accessed July 10, 2020, <http://nsidc.org/greenland-today/>.
- 13 See The Government of Greenland Ministry of Industry and Energy, *Greenlandic Ice Cap Water Heading for the World Market* (Greenland, 2018), [https://naalakkersuisut.gl/~media/Nanoq/Files/Publications/Erhverv/Is og Vand strategi og markedsfoering/Pjece om eksport af is og vand UK.pdf](https://naalakkersuisut.gl/~media/Nanoq/Files/Publications/Erhverv/Is%20og%20Vand%20strategi%20og%20markedsfoering/Pjece%20om%20eksport%20af%20is%20og%20vand%20UK.pdf).
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- 15 Ole Bennike, Jørn Bo Jensen, Frederik Næsby Sukstorf, and Minik T. Rosing, "Mapping Glacial Rock Flour Deposits in Tasersuaq, Southern West Greenland," *Geus Bulletin* 43 (2019).
- 16 See Martha Dowsley, Shari Gearheard, et al. "Should We Turn the Tent? Inuit Woman and Climate Change," *Études Inuit Studies* 34, no. 1 (2010): 151-165; Shari Gearheard, Matthew Pocernich, Ronald Stewart, et al., "Linking Inuit Knowledge and Meteorological Station Observations to Understanding Changing Wind Patterns at Clyde River, Nunavut," *Climatic Change* 100 (2010): 267-291; Shari Gearheard and Jamal Shirley, "Challenges in Community-Research Relationships: Learning from Natural Science in Nunavut," *Arctic* 60, no. 1 (2007): 62-74.
- 17 Dowsley et al., "Should We Turn the Tent?", 156-157.
- 18 Klaus Dodds and Mark Nuttall, *The Scramble for the Poles* (Cambridge, UK: Polity Press, 2016).
- 19 Klaus Dodds and Mark Nuttall, "Geo-assembling Narratives of Sustainability in Greenland," in *The Politics of Sustainability in the Arctic: Reconfiguring Identity, Space and Time*, eds. Ulrik Pram Gad and Jeppe Strandsbjerg (New York: Routledge, 2019), 224-241.
- 20 Dodds and Nuttall, *Scramble for the Poles*, 231.

- 21 Stiegler, *Neganthropocene*, 36.
- 22 Michaela King, Ian Howat, Songsu Jeong, et al., “Seasonal to Decadal Variability in Ice Discharge from the Greenland Ice Sheet,” *Cryosphere* 12, no. 12 (2018): 3813-3825.
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- 24 Ibid., 12.
- 25 Ibid., 13.
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- 27 Stiegler, *Neganthropocene*, 43.
- 28 Ibid., 47.
- 29 Ibid., 49.
- 30 See David Winfield Norman, “Jessie Kleemann between Orsoq and Turpentine,” in *A Cultural History of the Avant-Garde in the Nordic Countries, 1975-2000*, eds. Laura Luise Schultz and Tania Ørum, (Leiden: Brill, 2019).
- 31 *Sassuma Arnaa*, performed by Jessie Kleemann with vocals by Iben Mondrup and sound by Niels Lyngsø, Liverpool Biennial, Liverpool, England, 2012.
- 32 Harriet Newell Wardle, “The Sedna Cycle: A Study in Myth Evolution,” *American Anthropologist* 2 (1900): 570.
- 33 Kirsten Thisted, “The Hate in the Body: Language, Gender, and National Affiliation in New Greenlandic Literature,” *The History of Nordic Women’s Literature*, October 12, 2016, <https://nordicwomensliterature.net/2016/10/12/the-hate-in-the-body-language-gender-and-national-affiliation-in-new-greenlandic-literature/>.
- 34 I am grateful to Mark Nuttall for proposing *Pikialasorsuaq* and its full connotations as an exemplary way to understand the concerns of ice in the era of climate change at a workshop I held in Ilulissat, Greenland in June 2019.