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Sensing Asymmetries in Other-than-human Forms

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Abstract

This essay is an examination of how sensing capacities can draw in, and from, other-than-human entities—both animate and inanimate. Based upon ethnographic field research in Iceland, it describes sensory encounters that are realizable through the bodies, sensations, and ontological status shifts of other beings and entities, namely, in bears and ice and earth. As anthropogenic impacts deepen, the essay argues, sensing ought to be practiced as a collaborative effort among human and other-than-human entities. Sensing by other means entails sensing through others' means and beyond the human sensorium.

Keywords

Anthropocene, environment, sensing, futures, alternative life forms, climate change

Lost ice is the key index of polar temperature increase with the Intergovernmental Panel on Climate Change taking glacial diminishment to be one of

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the "highest confidence temperature indicators in the climate system" (Houghton et al. 2001; 35). New research released in December 2018 from the Geological Survey of Greenland and Denmark overviews nearly fifty years of satellite data as well as local sea-level measurements, demonstrating that the Arctic region is *the* leading contributor to sea-level rise, and it is Arctic glaciers that are having the most impact upon the world's rising waters (Box et al. 2018).[1] Greenland's ice sheet, for instance, while only one-tenth the size of Antarctica, is currently contributing twice as much to overall global sea-level rise.[2] Scientists have also concurred that the rate of melt in polar zones has been considerably underestimated (www.theguardian.com/environment/climate-consensus-97-per-cent/2013/nov/13/global-warming-underestimated-by-half), and future calculation efforts will need to account for unprecedented conditions that may not conform to historical models. Quantitative accounts of diminishing cryospheres are an essential tool conveying the effects of shifting environmental conditions, and the sociotechnical apparatuses of glaciologists, climate modelers, and geophysicists, among others, have provided an important and ongoing assessment of these transformations. However, there are also other ways of knowing—or sensing—the world's ice in its ebb and, increasingly, flow.

The mutations of the world's ice serve as powerful indicators of what Timothy Morton has called the "Age of Asymmetry" (Morton 2013, 161), an era created by the advent of consumerist modernity, the swell of industrial capitalism, and an epochal environmental shift that some are calling the Anthropocene. As environmental precarities intensify, and as asymmetries are amplified, a dynamic set of possibilities has also been put into motion: an exploration of how we "know" or "sense" ecological transformations that are occurring across the planet in scales both grand and minute. As Gabrys and Pritchard (2018) have elaborated, practices of sensing are expanding and moving from exclusively human-centered acts of decoding to more-than-human forms of sensory encounter (see also Gabrys 2016). Diverse forms of "sensing practices"—whether through tools, such as tidal gauges or biological bodies, like indicator species—offer a heuristic for understanding how effects are materialized for the entities and subjects, contexts, and processes that are implicated in environmental precarity. In this essay, I examine how sensing capacities can draw in, and from, other-than-human entities—both animate and inanimate. Can other-than-human modes of sensing establish different parameters to the arrangement of conditions, inputs, and causalities that refuse capture through any one metric, experience, or time horizon? Do other-than-human capacities to sense differently enlarge the boundaries of human comprehension, perhaps

especially in times when climatological shifts may feel increasingly unfathomable?

In a time of deep anthropogenic impact, I will argue, sensing ought to be practiced as a collaborative effort among human and other-than-human entities. That is, sensing by other means entails sensing through others' means and beyond the human sensorium. In this model, sensing practices are shifted from the expected categories of expert knowledge to include other-than-human bodies of knowing. Such a maneuver calls upon sense-ability in the way that Haraway (2007) has pictured "response-ability," the capacity to cultivate sensitivity toward others—through bodily and somatic means—as a form of ethical comportment (p. 71). As environmental precarity continues to destabilize earth systems, understanding sensing as a coproduced practice, wherein humans call upon other-than-human modes of experience, may allow us to realize a more robust encounter with changing ecosystems. The sensory encounters I describe here are realizable only through the bodies, sensations, and ontological status shifts of other beings and entities, namely, in bears and ice and earth.

My ethnographic field research has been sited primarily in Iceland, where some of the most substantial glacial retreat on earth has occurred in part because the Arctic region is heating at about twice the rate of the rest of the world. Iceland is a place where climate change may be sensed especially well because few places have experienced cryospheric diminishment more dramatically. Glaciers cover about 10 percent of the country's surface, and Iceland is home to the largest glacial mass in Europe. Since settlement in 874, glaciers have played an important role in Iceland's history and culture, often as a dangerous presence threatening to displace villages with encroachment and massive floods (Jóhannesson 2005). Because of climate change, however, the cultural valence of glaciers is changing as they become vulnerable and apparently in need of protection. Iceland's (approximately) 300 glaciers now lose 11,000,000,000 tons of ice per year and scientists predict that by 2170, all of Iceland's glaciers will be gone.

While scientists and media outlets have drawn attention to the risks of receding glaciers and melting ice sheets, another figure of demise has also occupied the popular imagination of climate change: the polar bear.

Egill Bjarnason was the first to spot the bear in the northwestern Icelandic town of Sauðárkrókur in the summer of 2016. He was in no doubt that it needed to be killed immediately, as it was close to a farm where children had been playing. Polar bears are not native to Iceland, but drift over on sea ice or swim from Greenland as their own cryoscapes elapse.[3] This was the first polar bear to have come ashore in Iceland since 2010. It is national

policy to kill polar bears on sight as they are inevitably hungry when they land (often in remote parts of the country) and therefore considered a danger to residents and livestock. After the dead bear's carcass was dissected, it was clear that the female bear had been both swimming for many miles and floating on drift ice. The shortest distance between Greenland and Iceland is 186 miles. But the distance between Greenland and the shore where this bear was first seen is twice that distance, about 373 miles. The bear, it was discovered, was also a mother who was still lactating, meaning it could not have been long since she was accompanied by her cubs.

The shooting of the mother bear induced an outpouring of affect across the country in the days that followed, seen especially on social media sites like Facebook. Reactions were divided along two general lines: (1) Icelanders must protect themselves and their livestock and it is up to local farmers or marksmen to ensure the safety of local residents. Or, (2) Icelanders ought to revisit the shoot-on-sight polar bear policy and put into place more humane responses to bear landings, given that they will likely increase as ice continues to melt in neighboring Greenland. Jon Gnarr, the former mayor of Reykjavík, who had campaigned (partly facetiously) on a platform that included hosting a polar bear at the Reykjavík zoo, saw future bear migrations as a potential boon for the country. "Why not make a tourist attraction of a polar bear haven?" he asked. Jon Gunnar Ottosson, head of the Icelandic Institute of Natural History, along with many others, decried the shooting of the bear, saying that it could have been shot with a tranquillizer rather than killed. A spokesman for PolarWorld, a German group dedicated to the preservation of polar regions and the creatures that inhabit them, called the bear's death "an avoidable tragedy," adding, in full irony, "this is another great day for mankind."

The bear's body, and the taking of her life, produced diverse responses both affectively and rhetorically. In the first instance, the slain bear exemplified humans' ability to protect themselves from itinerate wild animals. In the second instance, her death was seen as an excess of human cruelty. Across each of these responses lays the fact that the mother bear's very presence was the outcome of anthropogenic impact upon ice in the Arctic where polar bears have, in the past, flourished. The bear's death provoked emotive responses from the humans involved, but more than this, I would argue, her death drew attentions to the diminishing cryosphere that was the cause of her journey and, ultimately, her demise. The bear's body became a sensing apparatus for people to know a climatological fact of warmer waters and less ice; a fact that had lethal effects upon the bear herself. In other words, dead bears are one way of sensing lost ice, for humans and for bears.

Sea ice, which forms and melts each year in the Arctic, has declined more than 30 percent in the past twenty-five years. In November 2016, ice levels hit a record low (https://www.theguardian.com/environment/2016/dec/06/arctic-antarctic-ice-melt-november-record), causing Arctic climate experts to declare that "we are now in uncharted territory." "The trend has been clear for years," explained one, "but the speed at which it is happening is faster than anyone thought." Unlike on the Antarctic continent, melting sea ice in the Arctic exposes dark, open ocean beneath, absorbing more sunlight and thus warming Arctic conditions further. Dark waters absorb heat, and the reflective "albedo" effect, which bounces sunlight off the surface of white ice sheets and glaciers, is also reduced with each phase of melt. This, in addition to weather patterning, is why the Arctic is heating up much faster than the rest of the planet by some estimates as much as four times the average in the Northern Hemisphere. And of course, melting sea ice, as well as land-based ice, is affecting weather all over the world, especially as ocean currents are modified and their waters heated.

Helga Edmundsdottir remembers the sea ice when she was a girl growing up in a little village in the Northwest of Iceland. It terrified her at night. Ghostly moans were emitted as floating mountains of ice rubbed up against each other, aching out a frictional chorus. That is heard much, much less now. "Now," Helga explained, "I hardly ever hear that screeching sound of ice at sea. Or the sounds of it hitting up against the ships in the harbor. And while it scared me then, I do miss it now . . . ." Like a requiem, the absence of sea ice rings silently. Disappeared sounds strike Helga as a past passed, a memory more than a presently sensible experience. Lacking the eerie sound of sea ice, the coasts are quieter now than before. Sensing silence, then, might be taken as further confirmation of a melting north. Where cryoforms once wailed, their sonic disintegration signals wider, darker seas and coastlines more sparsely dotted with drifts of frozen water. Since sea ice also serves as bulwark and barrier to storm waves and the erosive powers of the world's oceans upon glaciers and land forms, the silencing of sea ice is also a signal of more disintegrations to come.

Alaimo (2016) reminds us that thinking the stuff of the world also means grappling with what she calls "the strange agencies" of ordinary objects. From her feminist, new materialist perspective, objects are not separate from human subjects but instead exist in a corresponding position to sense or know one another. The subject is, in this configuration, already part of the substances and systems of the world. I find parallels in lost ice, dead

bears, and a fading soundscape because in these sensory encounters, we are attuned not only to what has transpired but to the impending possibility of the might-be. This is sensing in the future subjunctive.

Guðfinna Aðalgeirsdóttir has just returned from Sólheimajökull, a glacial tongue about two hours southeast of Iceland's capital, Reykjavík. Guðfinna is a professor of glaciology at the University of Iceland and each year she takes a troupe of students to Sólheim glacier where they use a steam drill to bore through glacial ice, which she describes as operating like a hot knife through butter. A long wire line is dropped down the drill tube, dangling ten meters into the belly of the glacier. As the ice on the surface of the glacier melts away, the line will show more of itself. It is a simple, low-impact technology for measurement.

The ice lost on the surface is just one element of a glacier's movement from one condition to the next. Guðfinna explains that glaciers are anything but static; they are, by definition, in motion. In fact, Guðfinna says, glaciers are best understood as operating like a conveyor belt. They move themselves and they move material. Snow and ice accumulate in the higher altitudes of the glacier and are depleted in the lower reaches. There is a circulation of snow and ice from high to low, and from one point to another, just as there is movement from semisolid (snow) to solid (ice) to liquid (meltwater). Glaciers likewise store things; embedded in them are empirical records of the air, soils, and chemospheres of many millennia.

Icelandic glaciers are especially well-documented compared to many others in the world. The country has amassed several centuries of records, with very precise measurements beginning in 1902 (Kargel et al. 2014, 422). The Little Ice Age, which reached its full extent around 1890 in Iceland, saw the greatest areal extent of glacial forms in the country. Since then, glaciers have been retreating to their present-day positions, punctuated by a few variable periods of relative cool or warmth. Looking back over the twentieth century, Guðfinna notes that in the 1930s, it was warmer and glaciers retreated further. In the 1960s and 1970s, it became cooler and glaciers grew. "However," she assured me, "Iceland's glaciers continue to retreat and lose volume"; the country's ice caps are also losing about one meter of surface ice each year. This is ice that is not expected to return anytime in the near future. Since the mid-1990s, Guðfinna affirmed, glaciers have only gone in one direction and that is toward "ablation."

Ablation is the technical term for lost ice. In English, the word is defined, in the first instance, as "the surgical removal of body tissue." (And, in fact, the first person to carefully map the glaciers of Iceland was, by trade, a surgeon.) In its second definition, ablation denotes the melting, calving, or

evaporation of snow and ice. About half of ablation events occur through glacial and ice sheet calving; the other half occur through melting. While there have always been advances and retreats of glaciers, Guðfinna explains that Icelandic glaciers have now withdrawn much further back than in the warm 1930s. She describes that in the west Fjords, on the Northwestern peninsula, they are now finding vegetation growth indicating newly exposed terrestrial surfaces. Earth that has been covered in ice for at least 2,000-3,000 years is now being brought to light for the first time in human reckoning. This is effectively "new land" now uncovered by melt.

Guðfinna and I talk for some time about what she calls "glacial response." She explains that Earth systems have not yet fully reacted to the last two centuries of intensive carbon dioxide penetration into the atmosphere. She puts it quite plainly when she says, "This is the largest uncontrolled experiment that we have ever done. What we are doing now is we are pushing Earth systems into a regime that we have not been in naturally before. Not ever."

As billions of tons of glacial ice melt and fail to refreeze across Iceland, a different kind of response is occurring: the land is being depressurized and rising up at an intensified rate. This is called "isostatic rebounding." While many small island nations in the era of climate change appear to be sinking due to sea-level rise, Iceland is actually experiencing the inverse. It is pushing up out of the sea, at a rate of over one inch per year. Less ice on the island results in less weight on its surface. And in a place of geologic volatility, this results in more impactful subsurface movement of magma, steam, and other pressures. Due to their location on the tectonic plate boundary of the mid-Atlantic seismic ridge, many Icelandic glaciers also lie atop active volcanoes. An increase in volcanic eruptions, perhaps thirty times as many, is expected and appears to be multiplying, over the last twenty years. Vatnajökull, the largest ice mass in Europe, is covering at least four active volcanoes. Glaciovulcanism—the study of the interaction between magma and ice in any form (including snow and meltwater)—is a relatively new science with data gathering occurring primarily in Antarctica and Iceland. The volatility of geos (in the form of active volcanoes) and cryos (in the form of melting ice formations) has encouraged the installation of a system of highly attuned seismometers in Iceland that can quickly sense and respond to potential eruptions or subsurface melting events and their ensuing floods. These sensing devices allow for human accounting of geo/hydrological transmogrifications. But it is critical, too, that technical tools can only capture that which is in motion in the choreography between melting ice and molten Earth. In scenes such as these, sensing can be

recognized as an explicitly collaborative practice between geologic motion, cryospheric diminishment, and the human apparatuses meant to detect changing climatic conditions.

In 2013, the Icelandic Meteorological Office released the first map showing all of the country's glaciers in a single, detailed documentary image, the Glacier Map of Iceland (*Jöklakort af Íslandi*). Oddur Sigurðsson, with whom I spoke in 2017, served as the lead glaciologist in the map's creation in collaboration with the US Geological Survey and the Iceland Geosurvey. The map was brought to life by layering several decades of data from the Danish Geodetic Survey, US Army maps produced at the end of World War II, and Landsat and SPOT satellite images from the last four decades. It is a picture of a receding present, set in the context of a well-known past, and in the subjunctive form of an uncertain future. The cartography of Iceland's glaciers is a rendering and visualization, a laudable attempt at the "big picture." But, in other-than-human sensing practices, we also find other "pictures" of the world being unmade in particular ways.

Sensing Asymmetries

Both Stengers (2010, 2015) and Tsing (2015) have advocated for an attention to the different kinds of world-making practices and sensoria that are made available in times when environmental asymmetries cannot be ignored. For Stengers (2015), the history of humanity has been predicated on a relatively stable global context of coevolution with nonhuman others; for her, microorganisms have been especially engaged "actors" in the play of life on earth (p. 44).[4] For Tsing, the "blasted landscapes" that condition the present are not omens, but invitations to imagine and to sense differently within the fissures and gaps that compose an unbalanced world. Comprehending the multiple and shifting conditions of global climate change demands ways of sensing differently. In thinking about that difference, I have come to pose a composite question: through which sensing practices is the world being made? And, perhaps more specifically: how is the world's unmaking being sensed?

What is it that becomes executed in the bodies of shot bears, changing cryoforms, or new forms of Earth, unearthed? First, in dead bears, we become attuned to a pair of affective responses that derive from impulses of protection: one for the preservation of polar bears and the other for the protection of human populations. Perhaps more importantly, however, dead bears allow for sensing a greater impulse to care: for the multiple species endangered by anthropogenically affected systems that may strike polar

creatures first, but certainly not last. The affective pairing of bear/human fates in the case of the migrant bear may indicate the interlocked futures of humans and other species in a time when extinctions, adaptations, and migrations are becoming coeval conditions. Second, in ice lost through acts of ablation, we can sense temperature differently. Heat that is normally understood through tactile, metabolic reactions is now made visible through surface ice disappeared. And, it is made audible in drift ice silenced. With this process comes a metaphorical shift (in real time). Where we may have once subscribed to the notion that something "moving at a glacial pace" indicated a frustratingly slow event, glacial velocity would now seem to indicate a frighteningly rapid process. Finally, in places where Earth is moving and being newly exposed as ice recedes, geological time is experienced in ways that were not previously knowable within a single human lifetime. The slow life of geos that usually unfolds in the hundreds of thousands, or hundreds of millions, of years has suddenly gotten much, much faster. Geologic exposures of new earth uncovered by lost ice and magnified magma activity operate as an apt metaphor in their own rite:[5] speaking to an accelerated continuum in space/time/matter in ways that models and measures may not.

In melting ice, we have an epistemological device, a way of knowing the often inexplicable sensation of "climate." Glaciers and ice sheets have long told of a past, but now they appear to portend a future as well (Howe 2016). If ways of sensing climatological shifts are to become an increasingly critical practice, as I believe they can be, then it is imperative to ask what worlds are made or unmade through sensing and which sensory labors are being materialized. Approaching sensing practices through the capacities of other-than-human bodies,[6] we might better recognize the collaborative nature of sensing as a set of practices that occurs among humans and technological apparatuses as well as other entities. The sensing capacities of other-than-human forms—like bears and ice and earth—have the potential, I have suggested, to reveal aspects of a changing ecosphere in new ways. Sensing, feeling, and knowing the massive and yet enigmatic processes known as "climate change" means interpreting the world through human capacities but not necessarily through humans alone.

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Notes

1. While the Antarctic continent contains far more ice, its contribution to sea-level rise has not begun to approach the rates being documented in the Arctic region.
2. The Arctic region is currently shedding its cryosphere at a rate of 447 billion tons of ice per year, meaning that about 14,000 tons of water have been pouring into the ocean every second from 2005 to 2015; whereas in the years from 1986 and 2005, only 5,000 tons per second were being discharged into the world ocean. In only ten years, the quantity of Arctic melt has more than doubled compared to the twenty years prior (see Box et al. 2018).
3. Throughout recorded history, there have only been a few hundred recorded sightings of polar bears in Iceland. The oldest of these was in 890, sixteen years after the first settlers arrived on the island. During the Middle Ages, polar bears were frequently tamed; but since that time, no bear has been captured alive in Iceland.
4. Stengers (2015) writes that "the globally stable context of our histories and our calculations, is the product of a history of co-evolution, the first artisans and real, continuing actors of which were the innumerable populations of micro-organisms" (p. 44).
5. I am intentionally using the term "rite" as opposed to the more conventional colloquialism, "in its own right," in order to draw attention to the near-ritual qualities of these processes as they are played out in human dramas of media and apocalyptic foreshadowing.
6. Such an attunement to sensing otherwise also indexes the relationship between human perception and other "sentiences." These other sentiences, as Myers (2017, 75) has shown us, may "require cultivating subtler sensitivities" among humans as well.

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