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'We Are the Monitors Now': Experiential Knowledge, Transcorporeality and Environmental Justice

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Abstract: Residents of pollution hotspots often take on projects in 'citizen science', or popular epidemiology, in desperate, last-ditch efforts to marshal the data that can prove their experience of the pollution to the relevant authorities. Sometimes these tactics, such as pollution logs or bucket brigades, take advantage of residents' spatially-ordered and finely-honed experiential and sensory knowledge of the places they inhabit. But putting that knowledge into conversation with law requires them to mobilize a new, 'foreign' set of tools, primarily oriented to the observation, measurement, and sampling of pollution according to conventional scientific standards. Here, I employ qualitative empirical methods in two case studies of communities 'downwind' of Canada's contested tar sands region to demonstrate that the knowledge that is crucial to these citizen science strategies is not only local, situated, and 'experiential' in origin, but also collectively generated and held. I draw on the notion of transcorporeality, emanating from feminist theory of the body, to demonstrate that the knowledge offered to law through these efforts often represents a fluid merger of experiential and conventional ways of knowing, posing a productive challenge to the strictly positive notions of science and evidence dominant in legal proceedings.

Keywords: environmental justice; feminist theory; experiential knowledge; air pollution; popular epidemiology; transcorporeality; feminist epistemologies; sensory knowledge; expert evidence.

In contemporary environmental justice struggles across Canada, contests are being waged over data and knowledge, through claims of expertise and counter-expertise. An entrenched reliance on formal science elevates the data generated by accredited experts, especially in legal proceedings, leaving little or no room for ordinary people to put forward alternative accounts. In response, we are witnessing not only a growing tension between those who are allowed to have 'knowledge' and those who are not, but also an active re-negotiation of those categories (Wiebe 2013). Environmental justice activists have staked out a normative claim for valuing the expertise of residents living 'downstream' or 'downwind' in detecting and measuring pollution and its effects on environmental health (Brown 1992; Cole and Foster 2001; Di Chiro 1998; Steingraber 1998; Sheppard et al. 2002; Sze 2007). But even as experiential knowledge comes into vogue in academic and activist circles, formal law and its institutions do little to resist the notion that the most legitimate ways of knowing about bodies and environments require the instruments, practices and institutions of conventional science. In this project, I employ qualitative empirical methods to document the tactics of environmental justice activists deploying techniques of 'popular epidemiology'

based on experiential knowledges or 'smellscapes', through two case studies involving activist-residents collecting data in communities downwind or 'downstream' of the extraction in Canada's contested tar sands region.

"Downwinders", residents of pollution hotspots, are people who live downwind and downstream of large industrial complexes and suffer the environmental health impacts that go with it. These residents often take on projects in 'citizen science', or popular epidemiology, in desperate, last-ditch efforts to marshal the data that can prove their experience of the pollution to the relevant authorities. Sometimes these tactics of popular epidemiology, such as pollution logs or bucket brigades, take advantage of residents' spatially-ordered and finely-honed experiential and sensory knowledge of the places they inhabit. But putting that knowledge into conversation with law often requires them to also mobilize a new, 'foreign' set of tools, primarily oriented to the observation, measurement, and sampling of pollution according to norms developed outside the community, and structured according to conventional scientific standards. I argue that the knowledge that is crucial to these citizen science strategies is not only local, situated, and 'experiential' in origin, but also collectively generated and held. In fact, the knowledge offered to law through these efforts often represents a fluid merger of experiential and conventional ways of knowing, posing a productive challenge to the strictly positive notions of science and evidence dominant in legal proceedings.

The article consists of four parts. In *Part I: Transcorporeality and the Dissolving Body Boundary*, I introduce the notion of transcorporeality emerging from feminist theory of the body. In *Part II: The Nose Knows*, I outline the resistance tactics grounded in citizen science that are undertaken by environmental justice activists downwind and 'downstream' of the tar sands in two case studies. In *Part III: Translating Stench: Reception of Experiential Knowledge in Legal Proceedings*, I survey the way that experiential knowledge claims made by resident-activists are received in legal proceedings in each of my two case studies. Finally, in *Part IV: Fluid Mergers*, I present the argument that the evidence gathered through

these popular epidemiology tactics is experiential knowledge that emerges from an intersubjective milieu that is specific to place. In the process, the notion of "epistemologies of mastery" (Code, 2006) that continues to ground legal standards of 'expert evidence' in legal proceedings -- universally translatable truths found by individual, interchangeable, autonomous subjects working alone -- is further discredited. In fact, all knowledge is situated, partial, and generated according to shared norms and local customs. This gives rise to a call for a "negotiated empiricism", following Lorraine Code. In this negotiated empiricism, we find space for a fluid merger of conventional scientific practices with experiential knowledge gained by a collective. The merger of scientific and experiential knowledge can be uncomfortable, but residents really have no choice: science and experience each are strategically deployed, depending on the context, the proceeding, and the ultimate aims. Our constructions of what counts as reliable evidence in law need to shift in response.

This research project employs qualitative empirical methods, including in-depth, key informant interviews and participant observation, to learn about the resistance tactics of the resident-activists in both case studies.[1] In each case, while I zero in on the actions of particular resident-activists, I also conducted

[1] I interviewed Ada Lockridge in Aamjiwnaang in 2008 and again in 2013, and I spent quite a lot of time in the Aamjiwnaang community and Sarnia area over the intervening years. Participant observation in Aamjiwnaang involved participating in "toxic tours", working with the Health and Environment Committee of the Band to organize a series of "community forums" on pollution, and acting as an academic advisor to a youth group called 'the Green Teens of Aamjiwnaang'.I have spoken and corresponded many times with Ada about pollution questions over several years, but for the purposes of this paper, I relied on transcripts from the 2 interviews identified (as well as publicly available sources, such as her affidavit filed in court proceedings). I interviewed Diane Plowman and Donna Dahm together in July 2014 during a week-long stay in Peace River. The interview lasted approximately 90 minutes, and was taped and transcribed. In terms of sampling, since my research question focussed on the actions of resident-activists themselves, I specifically sought out key informants based on their involvement in resistance actions and/or regulatory proceedings. I also learned about the significance of the actions of these three resident-activists from other members of their communities. In each case, I interviewed at least 4 other individuals actively engaged with local air pollution problems, with most interviews lasting between 60 and 90 minutes. Data was analysed through a process of analytic induction, and quotes were subsequently selected as most illustrative of the point to be made.

interviews with and spent time with many other residents of the two communities.[2] Those residents' own resistance may have been expressed in other ways, venues or at different points in the struggle. The data gathered through these methods was supplemented by thorough review of the publicly available documentary record.

Part I: Transcorporeality and the Dissolving Body Boundary

Feminist thinking about materiality has gained momentum in the past decade and is contributing in exciting new ways to literatures on environmental health and environmental justice (Barad 2007; Grosz 1994; Sandilands 1999; Alaimo 2010). Material feminists are reacting to the fact that, "for the most part, contemporary feminisms requir[e] that one distance oneself from the tainted realm of materiality by taking refuge within culture, discourse and language" (Alaimo and Hekman, 2008: 1). Thus, material feminists venture boldly into the fraught territory that lies between biological reductionism and social constructionism, perhaps on the suspicion that reducing all to a social construction inevitably "colludes with commercialism in the long-term industrialist project of replacing the natural by the artifactual, defining a form of human existence which claims independence from natural processes and rhythms" (Alaimo, 2010: 352, citing Kidner 2000). According to these feminists, there is a material basis to life: an immediate, potent materiality that challenges all that the apparently autonomous, bounded, monadic liberal legal subject would like to disavow (Alaimo 2010:4). There is some convergence around Elizabeth Grosz' insistence that 'nature' exerts some resistance to our constructions of it (1994:190). In fact, Stacy Alaimo's "transcorporeality", which I take up below, is a theoretical site where "human corporeality, in

[2] While I do disclose the identity of the three resident-activists most central to my telling of the pollution battles waged in these places, I do not do so lightly, nor do I think it assists the argument. In each case the women agreed to be identified by name on account of the fact that any quick search of publicly available sources would easily identify them based on the other information provided here. Further, I am committed to recognizing the important work performed by these three women activists in their communities.

all its material fleshiness, is inseparable from "nature" or "environment"" (2008: 238). The emphasis is on movement and exchange between and across human bodies and nonhuman nature.

A critique of the liberal legal subject is common to many, if not all, strands of feminism and thus several important theoretical interventions laid the groundwork for the notion of transcorporeality to emerge. These include the set of interventions intended to socially-embed the subject, such as relational approaches put forward by Jennifer Nedelsky (1989; 1993), Martha Minow (1990) and others. These seek to emphasize that human beings exist in social relationships, which are relationships of power that impact the exercise of agency. "The self is relational", according to Nedelsky, because we become who we are – we shape our identities, capacities, and desires – "through the relationships in which [we] participate" (2011: 4). Nedelsky includes not just personal or intimate relationships, but also larger structural ones.

Some of the interventions by relational feminists, such as Martha Fineman's important "Vulnerability Project", attempt also to recognize *embodiment* (Fineman, 2008; Koggel 2009). In Fineman's words, the "vulnerable subject approach does what the one-dimensional liberal subject approach cannot: it embodies the fact that human reality encompasses a wide range of differing and interdependent abilities over the span of a lifetime… [it] recognizes that individuals are anchored at each end of their lives by dependency and the absence of capacity" (2008: 12). But Fineman's acknowledgment that "we are born, live, and die within a fragile materiality that renders all of us constantly susceptible to destructive external forces and internal disintegration" (Ibid.) produces an embodiment still eerily unhinged from ecology. To recognize that we inhabit our bodies, it seems, is not necessarily to place those bodies into an ecological matrix that can further influence – constrain or expand - agency and capacities (Scott 2009).

Feminist epidemiologists, among others, however, have explicitly layered this kind of ecological immersion onto the social-embeddedness of the subject. Nancy Krieger's conception of embodiment refers "to how we literally incorporate, biologically, in societal and ecological context, the material and

social world in which we live" (2012:937). On this account, burdens of disease vary amongst populations based on "the ways of living afforded by their current and changing societal arrangements of power, property, and the production and reproduction of both social and biological life, involving people, other species, and the biophysical world in which we live" (Ibid).

Alaimo's notion of transcorporeality (2008; 2010) zeroes in on the porosity and permeability of bodily boundaries made visible through this recognition. It focuses attention squarely on the "fleshy realities of socio-ecological interdependence" (DiChiro 2008: 279), noticing how bodies "always bea[r] the trace of history, social position, region and the uneven distribution of risk" (Alaimo, 2008:261). What is written there, "inside the fibres of our cells and our chromosomes – is a record of our exposure to environmental contaminants" (Steingraber, 1997:236). As such, transcorporeality "counters and critiques the obdurate, though postmodern, humanisms that seek transcendence or protection from the material world" (Alaimo 2010:4), and in so doing, marks a "profound shift in subjectivity":

> As the material self cannot be disentangled from networks that are simultaneously economic, political, cultural, scientific, and substantial, what was once the ostensibly bounded human subject finds herself in a swirling landscape of uncertainty where practices and actions that were once not even remotely ethical or political matters suddenly become the very stuff of the crises at hand (Ibid.:20).

In the case studies taken up below, one of those human subjects is Ada Lockridge, an Anishinaabe woman on reserve downwind of Canada's Chemical Valley, in southwestern Ontario. The landscape is her ancestral lands, surrounded by refineries and petrochemical plants now fed, by pipeline, the diluted bitumen that originates in Canada's tar sands region (Scott, 2013). The other human subjects are Diane Plowman and Donna Dahm, residents of Township Road 842, in the Three Creeks area north-east of the mighty Peace River in Alberta, where innovations in non-conventional forms of bitumen extraction have spurred a lawless "gold rush" mentality resulting in the venting and flaring of toxic gases that periodically blanket their homes. The practice or action that has been rendered 'ethical and political' in this 'swirling

landscape of uncertainty' is *breathing*...or more precisely, smelling. In the transcorporeal frame, even something as basic as "smelling" is cast as political. It is the witnessing and meticulous documenting of pollution, and it is a powerful act of resistance. The truth claims that flow from it issue a compelling challenge to conventional ways of knowing the world grounded in liberal political theory.

Part II: The Nose Knows

Communities downwind and downstream of major industrial complexes around the world are said to be fighting back with their senses (GCM, 2006). This part outlines various resistance tactics grounded in popular epidemiology undertaken by environmental justice activists in two communities affected by the extraction in the tar sands. Popular epidemiology is a form of political struggle in which residents of pollution hotspots *themselves* engage in the collection and marshalling of the data they need to prove their experience of the pollution (Brown 1992; Brown 1997). In the first case, downwind of Canada's "Chemical Valley", I consider Aamjiwnaang First Nation, where chronic exposures to air pollution, and the environmental health impacts that come with them – cancer and reproductive effects, asthma and respiratory effects, miscarriage and developmental disorders -- have been actively resisted through a variety of techniques and actions over the past decade (Black, 2014; Basu and Cryderman, 2013; Smith, Luginaah and Lockridge, 2010; Scott 2008). These include biomonitoring, community health surveys, body mapping and "bucket brigades".

In the second case, I consider the "Three Creeks" area outside of Peace River in northern Alberta, where the rush to extract bitumen has spurred heavy oil operators to experiment with technique, several years ago beginning to employ an extraction method called CHOPS (cold heavy oil processing with sand). These operators heat the extracted bitumen in open tanks to separate it from sand (Porter and Page, 2013). Nearby residents report spells of dizziness, nausea and fainting, among other impacts they claim are related to the gases that escape into the air and linger over their homes and properties, particularly during

the night when cooler temperatures create an 'inversion' in the Peace Valley (AER, 2014).[3] Residents along Township Road 842, one area particularly affected by these emissions, participated in the development of an 'odor-complaint protocol' with the regulator, and then adeptly subverted that process meant to contain them, through the meticulous documentation of residents' health effects on "pollution logs" and the strategic mobilization of that data in legal and regulatory proceedings.

Chemical Valley and the Aamjiwnaang Bucket Brigade

Launching a "bucket brigade" is one of many strategies of resistance taken up in Aamjiwnnang and other 'fenceline' communities around the world.[4] Residents of these "sacrifice zones" attempt to assume an active role in environmental monitoring and regulation (Lerner 2010; Overdevest and Mayer 2007). In essence, the residents are equipped to sample the ambient air in their communities at times and locations of their own choosing. The strategy is motivated by the belief that, according to Aamjiwnaang activist-resident Ada Lockridge, residents need to "investigate health and environment issues in our community independent of governments and industry to get the answers for ourselves rather than relying on the information they provide…" (2011:12).

When I took my first "toxic tour" of Aamjiwnaang and Sarnia, in 2007, there was only one state-controlled air monitoring station. It was 'upwind' of Chemical Valley. The reason the community started a bucket brigade in Aamjiwnaang, according to Ada, "was that it was, and continues to be, our experience that industry and government do not undertake adequate monitoring of air pollution in Chemical Valley"

[3] An inversion is created when a dense layer of cold air is trapped under a layer of warmer air moving over a river valley. When pollutants are present in the cold air near the valley floor, poor air quality can persist for longer than usual.

[4] The term "fenceline community" has emerged from the American environmental justice movement to describe the dynamic between industry and residents in places where large industrial facilities are located very close to residential housing. As an example, see the PBS film, "Fenceline: A Company Town Divided (Slawomir Grunberg, 2002).

(Lockridge, 2013). The bucket team consists of "sniffers" and "samplers" in a coordinated network using low-cost tools assembled with components from the local hardware store (O'Rourke and Macey 2003:384). Essentially, the *sniffer*, Ada, with her finely honed sense of the 'smellscape', decides when and where to take the sample. Ada then alerts the samplers, who show up with a 5-gallon paint can fitted with a valve and a special clear bag. If they do it right, the bucket will be able to store a sample of ambient air that can be subject to sophisticated analysis with proven accuracy. The pollution, just like that, is real.

Communities on the fencelines often live with the suspicion that neighboring industry deliberately releases high volumes of the most dangerous pollutants in short spurts – so that the emissions may show up as blips or anomalies in state monitoring reports (if at all). Community members from Aamjiwnaang, for example, will tell you that this is the reason they close their windows at night – they know from years of experience that this is when industry feels least likely to be caught (Lockridge, 2008).[5] Without adequate and reliable state monitors or the capacity to do its own monitoring, the community is faced with a scenario in which "someone from the reserve smells something really strong and calls the Ministry…[but] it takes quite a bit of time for them to arrive…" at which point the industry typically announces that there is "no offsite impact", or no risk to the community. The motivation that drives the bucket brigades, then, is to shift power relations by allowing the community to access information that it alone controls.

[5] For a stirring account of the way that pollution "incidents" colour everyday life in Aamjiwnaang, see Sarah Marie Wiebe, *Anatomy of Place: Ecological Citizenship in Canada's Chemical Valley*, Ph.D. Dissertation, University of Ottawa, August 2013: "In Canada's Chemical Valley, individuals are encouraged to prepare for hazardous incidents at any given time. As sirens wail, some local residents scramble to find shelter-in-place; others barely flinch" (at 5).

The scheme works because Global Community Monitor, a California-based NGO, often pays for the very expensive certified laboratory analysis of samples collected by bucket brigades.[6] GCM provides the community with a report, the technical support to interpret it, and assistance in developing a media strategy. "With just a few air samples," a founder of Global Community Monitor explains, "the community can collapse the house of cards built by the government and industry that pollution doesn't cross the industry's fenceline" (GCM 2006). This expectation is reflected in the remarks by Ada after the test results came in: "The Ministry of Environment has to move on this. We have the proof" (Poirier 2008). It is argued that for fenceline communities trying to come out from under a cloud of toxic emissions, the mobilization of a bucket brigade can signal the "transition from victims to agents of change" (O'Rourke and Macey 2003:398).

But it all begins with the sniffer. Residents of these pollution hotspots often claim a detailed experiential knowledge of their environments based on a sensitive and trained sense of smell. By relying on this expertise, the scarce resources – for the costly analysis of the bucket brigade results – are not 'wasted' on an ill-timed sample (Breech, 2013). In fact, members of Aamjiwnaang's bucket brigade are instructed not to take a sample unless the smell rates at least a six on a "stink scale" of 1 to10 (Lockridge, 2013).

The people of Aamjiwnaang First Nation inevitably develop, over the years, a specialized appreciation of who-emits-what based on olfactory evidence gathered on countless trips through the Valley. The 'smellscape', conceived in this way, is spatially-ordered and place-related. "[D]ifferent areas of the reserve ...have their own distinctive smells – some are like rotten eggs; others like gasoline; others like dental freeze" (Cormier 2006). Residents of Aamjiwnaang feel it possible to discriminate subtle differences in smell, and can correlate them with their industrial sources (Jackson, 2011; Lockridge,

[6] The laboratory that they trust is located near Los Angeles, California. It is approved by the US EPA for use in 'community environmental monitoring'. Once a sample is collected, it is immediately brought to a shipper, and sent away, along with a certified "chain of custody" sheet, to the experts in the lab coats far away (Breech, 2013).

2008). Ada Lockridge tells a story about taking her family to Tobermory, at the tip of the Bruce Peninsula jutting into Lake Huron for some 'fresh air' – and upon returning home, driving through Chemical Valley, her daughter opened the car window and remarked, "Ah. It smells like home" (2008). Another community member recalls, "There's a smell that comes off the styrene plant...and it reminds me of being little, when I was there. It puts me right back" (cited in Wiebe 2013: 83).

The Peace River Odour Complaint Protocol

Over the years that tar sands operators ramped up production using the CHOPS method, odours from heavy oil processing facilities in the Peace River area gradually became unbearable for residents. As one former oil worker and rancher put it: "We're being gassed out here" (personal communication, 2014). Residents described the odours as ""tar-like", sharp, pungent and acidic, or as smelling like rotten eggs, natural gas, chemicals, asphalt and diesel" (AER, 2014: 14). It is generally accepted that these odours can be attributed to RSCs (reduced sulphur compounds), which have low odour detection thresholds and can cause acute toxicity; VOCs (volatile organic compounds), which include benzene and toluene; and PAHs (polycyclic aromatic compounds), potential carcinogens present in tar and crude oil and "adsorbed to fine particulates when emitted to air" (Ibid. at 15).

Residents eventually testified at a public inquiry in 2014 that they experienced a range of physical and psychological health effects as a result of these odours and emissions from heavy oil processing. The symptoms included: cough, chronic nose and throat irritation, headaches, nose bleeds, nausea, eyelid spasms, shortness of breath, skin rashes, watery eyes, joint pain and stiffness, night sweats, muscle spasms, incontinence, loss of balance, loss of sense of smell, dizziness, extreme fatigue, disorientation, memory loss and insomnia (Davies, 2013). A resident testified that he was "knocked to his knees" by a strong odour encountered inside his home in the middle of the night (AER, 2014: 20). Symptoms were experienced to varying degrees, and not by all residents (AER, 2014). Some residents described how,

when they left their homes and ranches for periods of time, the symptoms would disappear, only to re-emerge again upon their return (Ibid.). For some, the health effects were so devastating that families abandoned their homes, and all their contents, and moved outside the region (Toledano, 2014).

Over the years, Diane Plowman, Donna Dahm and other residents of the area worked with the Alberta Energy Regulator (AER) to develop a "hydrocarbon odour-complaint protocol":

> The process was for the residents to phone their complaints to the field center. AER staff then contacted the operators of the area facilities and requested that the company inspect its operations for anything that may have been causing or contributing to the odours. Once the AER was in receipt of the inspection report, the information was reviewed, summarized, and then relayed back to the complainants…(AER, 2014: 49).

In the five-year period leading up to the inquiry, 881 odour-related complaints were reported to the regulator by residents in the Peace River area (AER, 2014). A high proportion of these came from residents along Township Road 842. Claims of adverse health effects accompanied about 40% of the complaints (Ibid.). Sisters Diane Plowman and Donna Dohm can take some credit for organizing this massive show of resistance. Starting in around 2010, they realized that if they "presented a reasonable case, for one thing, that would be the *only* likelihood someone would listen, and if [they] had evidence, maybe there was *some* possibility [things could change]…" (Plowman, 2014). "If the truth were told", says Diane, "… we decided to start collecting [the data] because [the regulator] *wouldn't*…" (Ibid.).

> I think it all began when they had a little town hall meeting…we'd say, "Gee, last week wasn't very good – this is back in 2010 – and they'd say "Well, what day was it? What time of the day?" [and we would say] "Well, I think it was Wednesday…so we decided at that point that we needed something a little clearer" (Plowman, 2014).

But the women quickly realized that information would not flow the other way.

> [W]hen we would go to a meeting, the AER would not tell us how many complaints had been filed. They would give a three sentence report – they would say that 32 complaints were filed over the past 26 days…And we would say, "What days were they"? …But they wouldn't give it

> to us, they said we would have to FOIP it [file a request under the freedom of information and privacy legislation] (Plowman, 2014).

The AER eventually responded to the residents' concerns by setting up a working group with industry and residents so that everyone could come to a better understanding of the concerns and develop solutions. But from the residents' perspective the working group was less than collaborative. "We would get together and smile at each other… the government would fly up in their plane and they'd spend the meeting texting who-knows-who…It was just so dysfunctional, at the end, and so we started gathering our information" (Plowman, 2014).

Meanwhile, a steady stream of complaints kept going in to the regulator. But there was little actual progress to show for it.

> Well, when we phone in, for example, and say the emissions were very bad this morning, they have a series of questions they ask us and we get a report back from them within, usually about 72 hours, that the companies did their own inspection. Prior to [this year], that's all they did! They'd contact the company and say we've had a complaint, and the company would walk around and –I'm not saying they didn't do a decent job but – it was all self-reported…It gets a little frustrating calling in, to be honest with ya, sometimes you just can't deal with someone [down there] saying, "OK, well, how bad is it today?" (Plowman, 2014).

Even when most residents understandably lost patience with the odor-complaint call-in protocol, Diane and Donna continued collecting their data. They typed up *Township Road 842 Emissions Log Sheets* and distributed them to all of their neighbors. The log sheet includes spaces for the resident to fill in the date and time of the incident, and any weather details. It asks the resident to identify whether they "detected emissions because of…sight___, smell___ or, how [they] felt_____". It provides a space for residents to check a box if they "felt negative health effects …before emissions detected". It provides a long list of boxes to check for reported health effects, which includes "burning/watery eyes", "scratchy throat",

"shortness of breath", "headache" and "sedated feeling".[7] Diane emphasizes that it also provides a space to indicate "none".

The women distribute the blank log sheets to their neighbors, and the neighbors fill one out "whenever they notice something". Donna and Diane collect them monthly. "We send an email at the end of the month, saying if anyone has logs, we'll come around and collect them….Lots of people have abandoned this [though]. They just see no value in talking to the AER anymore" (Plowman, 2014). Donna adds, "[a]nd we don't either … except for the fact that there is a record that we have reported it, and we get something back from them". She admits, however, that "at the time it's hard to believe that [things] will ever improve" (Dahm, 2014).

Part III: Translating Stench: Reception of Experiential Knowledge in Legal Proceedings

In this part I survey, briefly, the way that experiential knowledge claims made by resident-activists are received in legal proceedings in each of my two case studies. Ultimately, the Aamjiwnaang bucket brigade results came into formal contact with law attached as evidence to Ada Lockridge's affidavit in litigation that was launched in late 2010. The case has become known as the "Chemical Valley Charter challenge" as it makes constitutional claims based on the right to life, liberty and security of the person and the right to equality grounded in Canada's Charter of Rights and Freedoms.[8] Donna and Diane's pollution logs became evidence as appendices to their testimony in the public inquiry into "odors and

[7] Sample log sheets on file with author.

[8] Ada Lockridge and Ronald Plain (Applicants) and Director (MOE) and Suncor Energy Products Inc. (Respondents). (Amended) Notice of Application to Divisional Court for Judicial Review. Filed January 10, 2012. Ontario Superior Court of Justice (Divisional Court). Court File No. 528/10.

emissions from heavy oil processing" called by the Alberta Energy Regulator in 2014. In both of these cases, "smell evidence" was only grudgingly allowed into court.

A very brief review of the reception of smell evidence into legal proceedings will suffice here. Smells have not featured prominently in courtrooms.[9] As evidence of legally-relevant facts, recordings of sounds and sights – such as photographs, audio and video – have been much more prominent. In fact, smell has largely been dismissed in modernist thought generally, and presumably as courtroom evidence, because it is seen as too "subjective" (Levine 1994:1037). It is said that smells are far more difficult to *measure* than sounds, for example: "[a] sound of a certain number of decibels is known to be harmful to the human ear, but smell of a certain concentration may not affect all people in the same way" (Classen et al. 1994:170).

As far back as some of the earliest judicial cases involving public nuisance claims related to smell, we can find the notion of smell's "subjectivity".[10] In particular, Classen et al.(1994) note that "conflicts of interest" tended to colour these disputes. In attempting to resolve whether a particular odour can constitute a public nuisance, for example, it was understood that a smell might be "tolerable for those who are accustomed to it and have a profit to make out of [it]… [f]or those who are not and do not, however, it can be unbearable" (Ibid: 171). Similarly, in *Aldred v Benton,* in 1610, the defendant stated:

> The building of the house for hogs was necessary for the sustenance of man: and one *ought not to have so delicate a nose*, that he cannot bear the smell of hogs.[11]

[9] This statement glosses over the admittedly large volume of criminal law cases I encountered in which the accused sought to challenge a police officer's 'professional expertise' in detecting the smell of marijuana upon the opening of a car window.

[10] See for example, John M. Tyler, Et Al., Petitioners, Vs. John P. Squire Et Al., Respondents, Cambridge Mass. 1873, Testimony of Petitioners, December 1, 1873. Reproduced in *The Making of Modern Law: Trials,1600-1926* .

[11] *Aldred v. Benton*, (1610) 77 Eng.Rep.816 at 817. Emphasis mine.

The idea, clearly, is that there exists a variation in community tolerances or "odor annoyance levels", and that one's tolerances can be predicted according to one's material interests (Levine 1994:1037). The notion seems to be supported by local legend: unionized workers in pulp-and-paper mill towns are known to respond to tourists' queries about the sulphurous stench with the line, "It's the smell of money".[12]

Sometimes smell is described as "intensely visceral…a mere 'biological' sense..." (Drobnick 2006:1). It is said to have a "phenomenological immediacy" (Ibid.), as if olfactory receptors are "plugged directly into the limbic brain" (Porteous 1996: 36). But in fact, precisely how smell works remains a mystery. It is said to have "defied scientific understanding for centuries" – although in 2004, the Nobel Prize in Physiology was awarded to two scientists said to be on the verge of cracking the basic code by which scents are perceived and cognitively processed (Ibid.:2).

The mystery is furthered by the notion that there is something unique about the way we interact with our environments through the sense of smell – the way that odors are inhaled, incorporated into our bodies and transformed through the act of perception. There is a boundary transgression inherent in the act of smelling: to become aware of a scent is to have already inhaled it. Perhaps smell, say the cultural anthropologists, actually offers a more direct path to "truth" than the other senses. After all, using your sense of smell you can interact with the "essences or interiors of things" – not just the surfaces, as through the sense of sight (Classen et al.1994).

All of this presents challenges for conventional notions of evidence in law. As Drobnick says in relation to smell, "[n]o act of perception is a pure or unmediated event" (2006:1-2). The perception of smell, thus, consists not only of the sensation of the odours themselves, but engages our experiences and emotions

[12] I encountered this phrase first-hand in Espanola, Ontario in 1999; Clayton Thomas-Muller, an Indigenous anti-tar sands campaigner describes Fort McMurray Alberta as "reeking of oil money" (Thomas Muller, 2014: 247). Ruth Breech of GCM says she has "heard so many variations on this…expressed in many different languages" over the decade she has been working on these issues, that she has stopped counting (2013, personal communication).

associated with them (Classen et al. 1994:2). Thus, J. Douglas Porteous calls smells "information-poor and emotion-rich" (1996:36).

We might say that we experience our senses as *interfaces* between our bodies and our environments. What we "know" about our environments, we learn through our senses. But as Ulrich Beck has pointed out, contemporary pollution presents the problem that sometimes 'risks' are virtually undetectable without scientific investigation (Beck 1992). In fact, some of the most dangerous chemical culprits we "know" are *not* detectable by the nose (carbon monoxide is the most obvious, lethal, example). According to Beck, risks exist in the social world only so far as there is scientific translation (Ibid.). Understanding those risks, then, requires "the 'sensory organs' of *science* – theories, experiments, measuring instruments" (Ibid.:27).

And in fact, this is in many ways acknowledged by these activist-residents themselves. For example, Ada recalls that one of the samples the bucket brigade attempted to record was a "baseline" pollution level. Despite going out on a "clean air day", the team collected a sample that was later confirmed to contain carbon disulphide and carbonyl sulphide, substances for which no health-based ambient air standards existed in Ontario. Ada remarked: "This was shocking…as we did not know anything was present in the air at the time…[it] also scared us because we could no longer be sure that if we did not smell anything that the air was safe for us to breathe" (Lockridge 2011: 17).

What this demonstrates is that for the resident-activists in Aamjiwnaang, and along Township Road 842 in Three Creeks, odours are just indicators: what they really want to document are the chemical *emissions*. But the precise relationship between odours and emissions is elusive. In the bucket brigade context, the smells eventually come to be expressed as chemical concentrations; complex codes based on technical formulae are applied to determine the significance of those concentrations across time and space. In Peace River, despite a Herculean effort by the regulator to treat "odours" separately from "emissions", the

distinction effectively collapses in the wake of testimony by a state-appointed toxicologist in the recent inquiry, as is described in the next section.

What *is* smell anyway, if it is not just a bunch of molecules in the air, rearranged and reconfigured inside ourselves, and delivered as messages to the brain? Can it be anything before that moment of cognition? To return to the central claim of environmental justice activists engaging in exercises in popular epidemiology: the claim is that possessing the *data* constitutes a source of power for the community. But, the data, of course, is not the "smells" themselves, but the transcription of them – the results of their translation into numbers on a page. Through this process, the experiential knowledge of the activists becomes cognizable to law; through this application of a different set of skills and expertise, out of the hands of the residents themselves, the experiential knowledge becomes data that can be deployed in legal proceedings. As if recognizing that something might be 'lost in translation', Ada's affidavit filed in the Charter challenge states: "I wish to stress that since I was the one who took these three samples, the contaminants found were not just numbers in a lab result but [were] part of the air I was breathing on the days I took the samples" (Lockridge 2011: 18).

Found in Translation

The literature almost uniformly predicts that the incorporation of "citizen science" will make environmental knowledge and policy more robust and democratic (Ottinger 2010; Fischer 2000). In fact, Ruth Breech says part of GCM's message to residents is:

> You *do* have the power to observe. You *do* have the power to repeat. And what you are doing *is* valid…sure, you are not trained and we are not saying that you are taking the place of a toxicologist or an epidemiologist; they have a skill that they bring to the table. But what they are not listening to is that the people are the experts at living in their community…*they know the way the wind blows*… (2013).

The idea is that this democratization of science could influence policy "to be responsive to broad social concerns rather than the specific interests of elites" (Ottinger 2010:245). It could stimulate research into the health effects of repeated spikes in pollution levels, or the chronic effects of low-dose exposures. In this sense, efforts at citizen science are expected to not only contribute "information" about local air quality, but also to contribute knowledge that supports alternative modes of environmental regulation. In the following section, I explore the precise modes of translation through which the experiential knowledge of activists in Aamjiwnaang and Peace River became data deployed in legal proceedings.

Ada's Calendars

Ada Lockridge's pollution log is her calendar. She scribbles what she smells and feels right on the calendar under each day. She makes note of incidents that she has called the Spills Action Hotline to report. She keeps the calendars from year to year and once took them into town to photocopy and send to her lawyers (Lockridge, 2013). She wishes she could compare them against the information provided by the new air monitor on the reserve, which is supposed to be a "real-time pollution monitor", but she is not able to interpret the raw data, and was not until 2011 that the Ministry provided her with the report from 2008 (Ibid.).

On April 26, 2013 there was yet another pollution incident in Chemical Valley. This time, there was a chemical release from Shell Sarnia during a "turn around", and three men working at the facility "went down"; they "immediately passed out" (Lockridge, 2013). Ada's daughter reported that "it was really bad out there", prompting Ada to take an air sample as she watched her neighbors' kids gather at the school bus stop across the street (Ibid.). The release turned out to be hydrogen sulphide; the bucket captured levels of the chemical that exceeded both the provincial 24-hour health-based standard and the 10-minute odour-based standard. The local newspaper reported that, "[a]ccording to the US Agency for Toxic

Substances and Disease Registry, exposure to even low concentrations of the chemical can cause irritation to the eyes, nose and throat and may make it hard for people with asthma to breathe" (Wright 2013). No sirens sounded in Aamjiwnnaang on April 26. Ada was left wondering: "Do we need to go out and sniff the air every morning before the kids go out to wait for the school bus? Is that what our normal should be?" (Lockridge, 2013).

One of the preliminary motions filed by the respondents Ministry of Environment and Suncor Energy Products Inc. in the Aamjiwnaang Charter challenge was a motion to strike portions of Ada's affidavit. To be more precise, the motion was to strike 86 of the 226 paragraphs of Ada's evidence (and much of her co-applicants' evidence).[13] As a 'fact witness', the respondents complained about Ada's attempt to provide 'opinion' in her affidavit in relation to the "effects of pollution from the refineries on [her] community". The judge agreed: Harvison Young J. held that Ada Lockridge was "not qualified to provide expert opinions on these topics".[14] The portions of her affidavit considered to be 'opinion evidence' were ruled inadmissible and struck from the record. Most crushing was the conclusion that while Ada could give evidence as to studies she had participated in and what she personally had found, she could not give "expert evidence as to the results or import of such studies".[15]

Diane and Donna's Pollution Logs

> As far back as about 2004, I was writing on my calendar just the odd time that we could detect something out of the ordinary. We had no idea where it was coming from. It wasn't until this started to evolve in the next couple of years that we realized what was happening (Diane).

Diane and Donna also want to compare their notes, the data in their pollution logs, with the real-time pollution monitoring results. When they do so, and notice that "Gee, the hydrocarbon max was really high at 4 oclock [yesterday]. That's about when I started feeling not too good…" (Ibid.), they say it

[13] *Lockridge v. Director, Ministry of the Environment*, 2012 ONSC 2316.
[14] *Lockridge*, supra note 11, at para.101.

[15] *Ibid.*

speaks for itself. But the regulator refuses to cooperate. The AER insists "the monitors are only indicators, they are not evidence. They are just simply standards for ambient air. We would need canisters for evidence" (Donna). A canister would take an actual grab sample, but the regulator has refused to do canister samples. "We wanted a breakdown of the sampling and the toxic compounds, [but] they said they couldn't do that" (Ibid.). So instead of trying to look at whether any correlations existed between the pollution logs complied by residents and the recent data from the air monitoring trailer, the inquiry experts considered "2010 data from a van that was [there] for 10 days". "Anyway", says Diane, "[industry] controls the data. By 'controls', I mean they pay for it. So you have to ask industry for the data from the trailer". But even as she notes that industry controls 'the data', Diane readily admits, "we do have binders and binders of stuff".

Those binders proved useful when the AER finally yielded to calls for a public inquiry in 2013. Diane and Donna and several other residents along the 842 participated in the hearings. The Panel report acknowledges that this small group of residents "filed detailed logs that recorded odours at their residences and related health symptoms" and notes that these submissions were well-organized and credible (AER, 2011: 40).

The question of whether 'odors' or 'emissions' were causing the residents' health problems became a critical issue in the public inquiry. Emissions from heavy oil operations are regulated primarily through the Alberta Ambient Air Quality Objective (AAAQO). The framework establishes ambient air limits for specific contaminants, according to health-based thresholds. In other words, exposures at levels higher than these thresholds are recognized to cause adverse health effects through "direct toxic action". Alberta also has odour-based thresholds, but only for three chemicals -- hydrogen sulphide, carbon disulphide and

ammonia – but these don't apply "off-lease".[16] Therefore, for most pollutants, heavy oil operators can be in compliance with the AAAQOs, while still releasing emissions causing odours at levels detectable by nearby residents.

Dr. Donald Davies, a toxicologist retained by the AER, found, based on the ambient levels of air contaminants recorded by the monitoring trailers, that there was "no indication that the emissions from heavy oil operations [could] adversely affect the health of people in the area from the *direct toxic action* of the chemicals in those emissions" (AER, 2014: 16).[17] Dr. Davies did, however, ultimately allow that the symptoms reported by residents may be linked to the *odours* released by heavy oil operations. Reviewing academic literature that examines the health impacts resulting from prolonged exposure to unpleasant odours, Dr. Davies noted the consistency between these documented symptoms and the symptoms reported by Three Creeks residents. He also observed that, because responses to the odours vary across individuals, one would not expect all residents exposed to the odours to experience symptoms. Thus, even though he found that there was no evidence to support the conclusion that the residents' symptoms could be caused by the *emissions* (because he found their exposures to be below the recognized thresholds for *direct toxic effect*), on the whole, he could not deny the symptoms reported by the residents – arguably on account of the many binders of data submitted – and became persuaded of a possible link between the odours and those health effects.[18] Considering this expert evidence, the Panel concluded that "heavy oil operations are causing odours in the area and that these odours have the

[16] Off-lease odours refer to emissions from wells or batteries that are detectable beyond the battery or wellsite by smell. Off-lease odours were unregulated at the time of the inquiry.

[17] This is admittedly "on a short term basis". Dr. Davies did allow that the possibility of long-term or chronic effects was not assessed on account of a lack of data.

[18] Dr. Davies did try to maintain the position that "there is a difference between the irritant sensations that can be caused by odours and irritation that occurs as a toxicological effect" (18). The type of effect he found in this case was more of an "annoyance mechanism" than a direct toxic mechanism (24).

potential to cause some of the symptoms of area residents" (AER, 2014: 24). Therefore, it recommended that the odours be eliminated (Ibid.: iv).

Can Experiential Knowledge Count? Does the right data shift the power relations?

The formula is as familiar as it is overly simplistic: knowledge equals power. In reality, there are very specific ways that knowledge is incorporated into legal and political structures that are highly resistant to sudden shifts in power (Michaels 2008; McGarity and Wagner 2012; Wagner 2004). In this respect, scientific standards are crucial. Standards "structure judgements about the value of data produced by non-scientists" and "influence the ability of those citizens to be accepted as legitimate participants in knowledge and policy-making processes" (Ottinger 2010:247). Those same standards in fact are usually developed through collaborations between environmental regulators and industry experts – they are based on their shared training and overlapping professional networks (Ibid.). And while the regulators and the industry experts have much in common, they share almost nothing with the third group -- the residents – who are trying to gain access to the inner circle. Suffice to say that there are "extreme disparities of wealth, education", and political power between the residents of polluted communities "and those they seek to influence" (Ibid.:248).

There are standards for methods of air sample collection and analysis; for the detection of health effects in populations; for statistical significance in epidemiological studies; for allowable ambient air quality criteria, for odor-detection "thresholds", etc.[19] These standards provide the basis for judgements about what is relevant and irrelevant, what is reliable and unreliable (Ibid.). And yet, as mentioned, the

[19] Interestingly, there is a standard in Directive 060, governing "Flaring, Incinerating, and Venting" in Alberta, that requires petroleum operators to implement a program to detect and repair leaks, or what are known in the business as "fugitive emissions". It currently requires that operators meet or exceed the Canadian Association of Petroleum Producers' Best Management Practices (BMP) standard. However, the AER recently announced that, due to the high number of complaints from Peace River area residents, the Canada Standards Association will develop a new standard on fugitive emissions for the upstream oil and gas sector (AER, 2014:45).

standards themselves are often developed quietly amongst epistemic communities of experts, with shared values, in venues extremely vulnerable to corporate influence, and closed-off from public participation (Castleman and Ziem 1988; see also Wood and Johannson 2008: 367-368; Salter and Salter 1997: 81). They are then given political and material force as they are incorporated, sometimes wholesale, into regulations and formal law (Salter and Salter 1997: 79; Wagner 2003).

Still, it has been argued that standards not only constitute a resource for regulators, industry, and their experts seeking to *dismiss* residents' claims -- they can also be a resource for activists:

> ...combined with collective action and other strategies for overcoming power disparities, standards offer opportunities for citizens to render their challenges recognizable to experts (Ottinger 2010:251).

As an example, bucket brigades often release results without noting that the state standard they are comparing against is usually an 8-hour average and the bucket stores a sample taken over a period of 3-6 minutes. The residents, according to Ottinger, are "not ignorant of the incommensurability of the standards" -- they mobilize them strategically (Ibid.:262). And further, the bucket brigades are intended to hold an implicit critique of the way those standards treat *peaks* in pollution levels. In other words, the fundamental challenge presented by the buckets is that "the experts' monitoring practices could *never* yield data that would adequately represent the health risks faced by communities" (Ibid.). Accordingly, in Aamjiwnaang, the bucket brigade data is deployed in combination with other collective action tactics in order to demonstrate that neither the monitoring, nor the standards themselves, are adequate to protect the health of residents.

The terms "citizen science" and "popular epidemiology" are applied to describe this kind of "knowledge production by, and for, non-scientists" (Ottinger 2010:245). In Aamjiwnaang, Ada and others have led residents in conducting community health surveys, biomonitoring studies and participatory body-mapping

exercises. In Peace River, Diane and Donna have gathered pollution logs, registered hundreds of odor-complaints, compiled 80 binders of data, and submitted volumes of material to regulators. In both cases, activists are trying to correlate contemporaneously recorded symptom-sheets with time-marked monitoring data, in order build a compelling case for how the emissions *cause* the health effects. GCM says it has been most successful at forcing industry action when it can produce multiple log notes from different community residents all taken contemporaneously that demonstrate that people experienced similar physical symptoms, or sensations, at the same time (Breech 2013). The strategy seems to be to tap into ordinary people's common-sense notions of causation.

Yet, when advocates speak of the credibility and legitimacy of data collected through exercises in popular epidemiology, they inevitably do so through recourse to scientific standards, exposing a tension in the normative basis of the strategies and their characterization as citizen science. To what extent is the data based on experiential knowledge? Take the bucket brigade as an example. The "sniffer" undoubtedly employs a detailed experiential knowledge of the smellscape to come to the decision to collect a sample. Once the sniffer sounds the alarm, however, the "sampler" in fact mobilizes a new set of tools, primarily oriented to the observation, measurement, and sampling of pollution according to conventional scientific norms. Similarly, in Peace River, what begins as a collective project of documenting bodily responses to pollution -- symptoms of poisoning, essentially[20] -- ultimately feeds into a claim dependent on toxicological thresholds and standards crafted elsewhere and for entirely different purposes in venues utterly impenetrable by residents.

On the other hand, in the broader context of the strategy of popular epidemiology as a whole, the 'scientific method' plays a very *small* part in the social bond legitimising the narratives. In both

[20] On page 18, the AER uses the language of "poisoning" to describe what would have been occurring if the residents had been experiencing their symptoms as "direct toxicological effects".

communities, the residents are fighting to become participants in regulatory processes that make judgements about *whether the air in their community is safe to breathe*.[21] The resistance strategies are legitimised through a social bond forged through the common experience of living on a day-to-day basis with these risks. In Aamjiwnaang, the detection of benzene is given force by the experience of living in a small, tightly-knit community that has lost two young children to cancer over the course of this struggle (Lockridge 2011:35. Everyone in Aamjiwnaang knows that benzene is a proven carcinogen tied to the incidence of childhood leukemia.

When Ada Lockridge recounts stories of both exceptional and routine pollution incidents unfolding, they are always stories involving others. Either her daughter calls her to say "her nose is burning up" on Hwy 40, or her sister calls her frantically, saying "What the hell is out there, Ada? The smell is all through my house…" (Lockridge, 2013). Further, because of her role, Ada finds that "many people from the reserve rely on [her] to hear their stories about pollution and health" (2011:3). In her affidavit submitted to the court, she states that because her community has relied on her to hear their stories, fears and concerns over so many years, she has gained a specialized knowledge and understanding.[22] She explains also how the community, collectively, is trying to maintain a viable Anishinaabe cultural life and identity on the reserve, despite the circumstances: "I'm trying to think of the seven generations to come and stay with the people I know and love and the land we've always lived with" (2011:39). Finally, the collection of data with the buckets was accompanied by, followed and stimulated, further practices of popular epidemiology

[21] In both places, as expected, the communities are not unanimously in favour of using these tools to fight the pollution: communities and families are conflicted about the presence of the industry (and the industry's tactics in some cases are designed to divide them). But the common experience of living with the risks is real, even if it is navigated differently by those differently situated.

[22] She has also borne a burden: "It's hard to go to funerals where people have died of cancer, particularly for the kids, because I feel like I'm letting people down in some way. I feel like I need to work harder…but…It shouldn't be my job to keep track of this. It is a full time job and I spend more than 40 hours a week doing this. I feel like I'm doing the Ministry's job" (2011:36).

in the community (Ecojustice 2007; Mackenzie et al. 2005; Lockridge, 2008; 2013; Wiebe 2013; Basu et al. 2013).

In Peace River, the social bond legitimising the narratives is forged through staying in one's home, despite the risks, even as others understandably flee. As mentioned, the health effects were so devastating for some that they completely abandoned their homes and ranches, along with their contaminated contents. In particular, all the children along Township Road 842 seem to be gone. One resident who fled with her family in 2013 stated, "If things don't change, there will be many more people who will realize that they have the same choice we had: you can stay and be sick, or you can leave" (quoted in Toledano, 2014). Another resident who was involved in litigation with one of the industry operators to try to obtain compensation stated: "We've moved out of there, we've moved on. But there are still families left there, right? This needs to be fixed… (Ibid.) These residents – those that remain and those that flee, and especially those that tried to shape the outcomes of the inquiry -- are exercising agency in a material world that is otherwise tightly structured by forces outside their control. The residents that remain are choosing to resist because they have no choice but to inhale, despite what they know about the air they breathe.

So, perhaps the data actually *is* the smells – and they are collected according to a well-honed experiential knowledge that is collectively held. That is, the smellscape is built, the data points are gathered, ordered and assigned significance not by individuals acting alone, but collectively, through a system of constant feedback and affirmation in which individuals make judgements in relation to the reactions of others to the external stimuli in their shared environment. As in Geertz's (1983: 75) classic definition of local knowledge, it is a way of knowing that is "practical, collective and strongly rooted in a particular place"; it constitutes an "organized body of thought based on immediacy of experience".

Part IV: Fluid Mergers

In order to validate experiential knowledge in legal proceedings, we might take cues from the "downwinders", paying attention *to and with* their bodies. As they demonstrate, we learn from our senses not in isolation, but more significantly, we learn from many of them at once. It is clearly about paying attention "not just to what [one is] smelling, but what [one is] feeling" (Breech, 2013). Residents along the 842 are encouraged to record not just smells, but also bodily sensations and symptoms, such as headaches, nosebleeds, nausea and dizziness. As one resident puts it, "[w]e detect the aches and pains in our body before we smell it as its cropping up in the air" (quoted in Toledano 2014). Noting the lack of effective monitoring, another resident says: "We can't know if its being done right or not. We don't have the ability to tell that…we just have to rely on what our bodies are telling us, and when we're sick and when we're having symptoms. *We are the monitors now*" (Ibid., my emphasis).

There are parallels to Deleuzian conceptions of the body, which do not rely on an individuated subject, but call for, in Anne Bottomley's words, a "morphing of the body into a site of patterns, flows and intensities in which the emphasis is continually on movement" (2002:140). As I have argued elsewhere, what this model provides is an antidote to the individualised ideal of the liberal, monadic legal subject (Scott 2009; 2012). The body comes to be perceived, as Grosz says, ''not as an organism or entity in itself, but as a system, or a series of open-ended systems, functioning within other huge systems it cannot control'' (2004:3). This conception is productive because it places the downwinders as transcorporeal subjects immersed in a social, historical and political context that both defines their vulnerabilities to the pollution, and demands a collective response.

If we accept the model by which we conceptualize our senses as our 'interface' with the environment, the act of smelling is conceived simply as a chain of events in which molecules in the air are picked up by sensors in the nose, and transmitted as signals to the brain. But the notion of transcorporeality ruptures, if

not smashes, this orthodoxy. Our senses might go some distance in tracing the mostly invisible, but still material, flows of substances between economic actors, bodies, and ecosystems, but much of that flow also passes right 'under our noses', so to speak. According to the interface model, smells enter through our nostrils, to be perceived and cognitively processed ("plugged directly into the limbic brain"), but the body itself remains solidly bounded. Instead, in a transcorporeal frame, the body's boundary dissolves, and the smells must be conceived as running "right through us, in endless waves" (Fromm, 2009: 95). Nancy Tuana (2008) uses the term "viscous porosity" to describe this: "leakages suffuse" (Nixon, 2010: 63), but this is not to say that the flow is unconstrained. The key point is that the mediating membranes may be biological -- and they may also be social or political (Alaimo, 2010). In a transcorporeal frame, then, chemicals are constantly penetrating our bodies, making the notion of smelling and feeling together, turning attention to and with our bodies, more powerful.

To say that experiential knowledge is local and situated, collectively generated and held, and emanating from place, is not to undermine its credibility or authority. It is to point out that *all* knowledge in fact shares these attributes. "Scientific" knowledge about pollution is no less situated -- it emerges as well from a particular social context and set of shared norms (Jasanoff & Martello, 2004). The laboratories that turn smells into numbers on a page are implementing a specific set of norms, applying a shared code. That code, the exclusive domain of accredited experts, is as "difficult to discern and communicate beyond the particular setting where it is generated and held" (Iles, 2004: 291) as any that might belong to a group of downwinders. In other words, the laboratory technicians draw conclusions on the basis of the application of a set of conventions, collectively-held and locally-situated, in the same way the residents draw conclusions about their exposures on the basis of their pollution logs, their rich knowledge of each others' health problems, and their detailed knowledge of the smellscape.

This recognition generates respect for a plurality of careful empiricisms. It harkens Lorraine Code's notion of ecological thinking: "an empirically-based, evidence-respecting position that takes empirical

evidence seriously while contending that evidence rarely speaks for itself either in its claims to count as evidence or in its meanings and implications" (2006: 23). The claims of positivist science "may not indeed be rendered false" through ecological thinking, but their limitations, according to Code, are likely to be exposed, and their pretense to "the one true story" is likely to be challenged (30). The downwinders' truth is tied to smelling and feeling, sensing, prior experience, and knowledge of the place. In this transcorporeal frame, experiential knowledge acquires an enhanced status -- not an uncontested credibility or authority -- but a basic validity.

Conclusion

The sniffers and samplers of the Aamjiwnaang bucket brigades; the instigators and subverters of the "odour complaint protocol" in Peace River, are working at becoming 'ordinary experts' (DiChiro, 1998). They are engaging in everyday social practices that combine experiential ways of knowing with scientific ways of understanding the material reality of our world (Ibid.). Their projects grow out of a recognition of the limited capacities of experts, the flawed logic of their systems, and the partial or incomplete nature of all forms of knowledge. In both Aamjiwnaang and Peace River, they are responding to a regulatory dynamic created by a chronic lack of pollution enforcement (Amos et al. 2011; Scott 2008; Collins 2007; Nikiforuk 2014; Environmental Defence 2013; Carter, forthcoming).[23] In fact, the residents are dealing with what Noga Morag-Levine calls a "perpetual mobilization regime" (2005): a regulatory system designed so that affected communities must repeatedly bear the burden of proving that air pollution is harming them.

The situation both forces residents to fall back on their senses, and demands that they transcribe their collective knowledge into new, and foreign, forms. It is an in-between, uncomfortable place. Susanne

[23] In fact, Diane Plowman invokes the notion of citizen enforcement filling a regulatory void by remarking: "What more can we do? We're doing our part... Well, we're doing their part too."

Antonetta, in *Body Toxic: An Environmental Memoir,* says: "I choked [the] facts but they choked me back" (2001:27). Alaimo's interpretation is that Antonetta's 'choking' of the facts represents her attempt at positioning herself as a 'knower' within the dominant scientific framework. But she encounters a tension: the 'choking back' means that Antonetta really could not "imagine herself as a transcendant knower, removed from the material realities that have caused her tumours, asthma, and miscarriages" (Alaimo, 2010: 100).

When Mel Chen asks us to consider "[w]hich bodies can bear the fiction of independence and uninterruptability" (2011: 274), we are forced to admit that there is both a predictability and a deep unpredictability to this. The unpredictability traces back to transcorporeality and the myriad "material agencies that humans can never quite chart and can certainly never master" (Alaimo, 2008:261). The predictability derives from the insights of the environmental justice movement: that pollution is most easily found in places inhabited by the poor, the racialized and the marginalized. Thus, places (shaped as they are by colonial histories and geographies, and marked by capital's whims) are filled with bodies (marked as they are by race, gender, sexuality and ability). Those bodies are "porous but resistant, plural and connected" (Gabrielson and Parady, 2010: 376).

Experiential knowledge of the smellscape, and the citizen science it generates, is a way of knowing grounded in bodily experience -- it constitutes sensory, but also social knowledge. It is also a way of knowing specific to place. And these place-based ways of knowing inform acts of resistance against competing constructions of truth and harm (Cresswell 2004). Picking up this notion of resistance, we can see that the theory of transcorporeality not only directs us towards the permeability of the bodily boundary, but also the science/experience boundary. It leads us to consider a way forward that refuses such a sharp distinction between the knowledge gathered by residents "sensing" their environments, and the knowledge that is generated about their environments through the application of scientific instruments, protocols, standards and codes. These forms of merger have been said to generate

"hybridized" or "fused" knowledges (Jasanoff and Wynne 1996; Corburn 2003). For downwinders like the residents of Aamjiwnaang and Township Road 842 in Three Creeks, the most comfortable ways of knowing may not be instrument-dependent, but activists are willing to engage in the strategic deployment of new tools, with all their trappings, in order to gain access to legal proceedings that can determine something as fundamental as the quality of the air they breathe.

But despite some discrete wins and incremental gains, meaningful and durable improvements in air quality cannot yet be ascribed to the resistance actions of the residents in either Aamjiwnaang or Peace River. This is not to diminish the significance of their efforts, but to underscore the entrenched nature of the regimes they wish to challenge. In order to begin to chip away at the logic of those regimes, we need to put forward experiential knowledge that grounds compelling, alternative causal narratives. To validate this experiential knowledge in its fluid merger with conventional science, we need to find a way to counter the 'epistemologies of mastery' that pervade legal proceedings and rule-making institutions. Those proceedings and institutions continue to focus on precise measurement and strict, linear notions of causation. They implicitly adopt the idea of a universally translatable truth to be found by individual, interchangeable autonomous subjects working alone. A negotiated empiricism, attenuated by transcorporeality, instead puts forward the possibility that experiential knowledge is robust *because* of its inter-subjectivity, not in spite of it.

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Dedication: We lost a tireless advocate for justice when Diane Plowman passed away on May 31, 2015. I dedicate this article to her, and to countless others like her, who are fighting against the odds, largely without recognition, to improve the air in their communities.

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