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# Editorial: Environmental justice and the embodied, lived experiences of toxic pollution



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The disproportionate impacts of toxic pollution have been well documented in environmental justice research, with marginalised, low-income and minority communities tending to bear the greatest burdens of industrial pollution. Environmental justice researchers have contributed significant insights into the myriad forms of injustice associated with the uneven benefits and burdens of fossil fuel extractivism and industrial pollution. These injustices have been explored across the world on varying scales of enquiry, from those examining North-South dynamics in relation to climate change to those interrogating the distribution of environmental and health impacts from specific industrial sites, and how these are experienced by proximal communities living.

While environmental justice struggles and the disproportionate burdens of toxic pollution are closely bound up with the specific contexts in which they emerge, all of these are tightly connected to the domination of an expansive and extractive fossil fuel industry, perpetuated and supported by powerful interests,. Political economists (e.g. Newell and Mulvaney, 2013; Paterson and P-Laberge, 2017; O'Hara, 2009) have written extensively on the economic and political origins of polluting industries and the historical dependence of an economic system continued fossil fuel extractivism, production and mass consumption (i.e. 'carboniferous capitalism'). This dependence on fossil fuels goes beyond material interests to embody and signify cultural meaning and of privileged subjectivities, as scholars have recently drawn out (Huber, 2013; LeMenager, 2016; Daggett, 2018).

Environmental injustices and the uneven experiences of fossil fuel extraction and production cannot be divorced from the evolving political and economic landscapes, both

on micro and macro scales of analyses. The investments made by fossil fuel and petrochemical multinationals are continuing to increase in scale and ambition, with plastics production [projected to increase by 40% in the next decade](#). Indeed, many of these firms seek to address the economic challenges of changing markets for fuels and the emergence of electric vehicles as an opportunity to increasingly integrate refineries with petrochemical production plants and to expand its plastics manufacturing bases.

As a [Guardian report recently revealed](#), many of the same companies supporting an ‘alliance to end plastic waste’ are among those behind the largest investments in new plastic production plants (e.g. ExxonMobil, Shell). The projected ‘global boom’ in plastic manufacturing is closely connected to the expansion of fracking operations in the United States. As scholars have argued (Paterson and P-Laberge, 2017; Newell and Mulvaney, 2013; Newell & Paterson, 1998), a contradiction of ‘carboniferous capitalism is that powerful business interests are dependent on maintaining the status quo and of expanding fossil fuel and petrochemical operations.

In other words, the global petrochemical industry is driven by unsustainable modes of operating and of unsustainable systems of production and consumption. This is despite growing and ever more urgent environmental crises that are enveloping the planet. A recent UN report suggests that we have around 12 years remaining to ensure global temperatures do not exceed 1.5°C (IPCC, 2015), while the plastic waste crisis is understood to be pervasive and indomitable, closely connected as it is with the fossil fuel industry and unsustainable production and consumption practices. [Scientists recently warned](#) that plastic waste risks “near permanent pollution of the Earth”. Within these uneven configurations of power and capitalism, the petrochemical industry brings about subjective, differential and everyday experiences of toxicity.

From interdisciplinary perspectives, the articles in this issue of Toxic News seek to make visible issues of environmental justice in industrial sites and to bring to light the differential, everyday lived experiences of toxic pollution across cases in the United States, Canada and Italy. Each of these articles highlights the emergence and perpetuation of environmental injustices within myriad, divergent contexts. These highlight the continued need to ‘connect the dots’ across geographic spaces and across different links in the petrochemical supply chain (from oil exploration and fracking to plastics production to managing plastic waste), and to reveal the commonalities across and between environmental justice struggles.

Firstly, [Diane Sicotte](#) unpacks the emerging toxic connections between the expansion of fracking in the United States and plastics production. She draws out the mutually reinforcing relationship between the low-cost of natural gas and the profitability and expansion of plastics manufacturing. In doing so, the article interrogates the toxic injustices that emerge across the petrochemical production chain.

Secondly, [Troy D. Abel, Jonah White and Stacy Clauson](#) make visible Seattle’s ‘segregated riskscape’, detailing the disproportionate burdens of toxic pollution borne by communities in low-income and socially vulnerable neighbourhoods in South Seattle, compared to the more affluent Northside residents. These patterns in Seattle tend to reflect the concentrated advantages and disadvantages which have become prominent in many US cities.

Thirdly, *Sarah Marie Wiebe, Jen Bagelman and Laurence Butet-Roch* draw attention to the toxic pollution in Canada's Chemical Valley in Sarnia experienced by indigenous peoples at the Aamjiwnaang First Nation reserve. Through a photo essay, the authors argue for a more multi-dimensional, prismatic account of the Aamjiwnaang's everyday exposure to toxins and practices of resistance. In doing so, they seek to uncover the lived realities and environmental injustices embedded in places exposed to toxic pollution such as Chemical Valley.

Fourthly, *Sophia Jaworski* critically reflects on the chemical sensitivities connected to the complex contexts of petrochemicals in Toronto, Canada. She draws out the embodied, everyday and uneven experiences of toxicity and toxic exposure, specifically in relation to the impact of these upon health and well-being. She argues for moving beyond examinations of the environmental injustices associated with communities in proximity of industry towards interrogating the toxicity of everyday landscapes.

Finally, *Angelo Raffaele Ippolito* explores the moral struggles of a community in Taranto, Southern Italy, faced with industrial pollution from the largest steel mill in Europe. Drawing from ethnographic fieldwork, he interrogates the lack of community mobilisation in the community since the 1960s and the social, moral and historical structures that enabled such minimal environmentalism in Taranto.

# The Toxic Relationship between Fracked Gas Liquids and Plastics



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The current worldwide boom in natural gas extraction is due to the new hydrofracturing (fracking) method, even though there is ample scientific evidence that fracking creates extreme risks to human and ecosystem health.<sup>[1]</sup> The production of plastics and the proliferation of plastic waste poses risks just as great.<sup>[2]</sup> While many know of the harms from fracking and plastics production, few know that there is a mutually reinforcing relationship between fracking and plastics.

The non-governmental organization [Food and Water Watch](#) was the first to focus on this issue. It published an issue brief exposing the connection between fracking and plastics production in May 2017. Although the connection between fracking and plastics has not received much attention from mass media, a few news stories appeared in fall 2017 about the new gas liquid export route connecting the gasfields of Pennsylvania with petrochemical complexes in [Scotland](#), and stories appeared in both the scientific press

and the business press about how fracking was reviving the plastics industry (see [here](#), [here](#) and [here](#))

The economics of the fracking-plastics connection are as simple as the environmental implications are troubling. When a well is fracked, the substance gathered is “wet” (or crude) gas, which contains the gas liquids butane, ethane and propane. Gas liquids are separated out in a natural gas processing facility (fractionator); the purified “dry” gas is sold as a fuel, while gas liquids are sold to petrochemical industries as feedstocks for the manufacture of plastics and many other substances. The Marcellus Shale formation in the Northeast U.S. is particularly rich in ethane, the gas liquid that has become the principal building block for polymers. Currently, about 40% of U.S. natural gas comes from the Marcellus Shale, producing a high volume of ethane that is being sold at low prices. Raw materials make up 60-70% of the cost of plastics manufacturing, so low-cost ethane is increasing the profitability of plastics manufacturing. And of course, if plastics are increasingly profitable, that is an incentive to produce more and more.

In addition to making plastics manufacturers richer, natural gas liquids produced cheaply through fracking serve a second economic purpose: they allow the profit margins from fracking to remain acceptable to gas corporations even in the face of gas overproduction and low gas prices.

Each step in the fracking-plastics production chain threatens the health and safety of people and ecosystems. For just one well, fracking uses 5-12 million gallons of water, which flows back from the well as “produced water.” Produced water contains toxic chemicals added to force open the fissures in the rock created by the drill, together with naturally occurring toxic substances such as arsenic, cadmium and radioactive isotopes. This wastewater is too toxic to treat at a water treatment facility, so much of it is disposed of by injecting it underground. In Oklahoma and other states in the U.S., underground injection of wastewater has destabilized rock formations, causing swarms of earthquakes. Many wells in fracking communities have become so polluted with chemicals, natural gas and gas liquids that they became flammable. Fracking also generates clouds of toxic air pollution, which threaten the health of people living near wellpads. Methane leaks at the wellhead, from gas flaring (burning off waste gas) and from every type of pipeline transporting natural gas. Anyone concerned about climate change should be alarmed at these releases of methane, as methane’s short-term warming potential is [86 times that of carbon dioxide](#).

In the U.S., the number of gas refineries, petrochemical plants producing plastics, and liquefaction plants that prepare gas and gas liquids for export are all increasing. All of these pose serious health and safety risks to surrounding communities, many of which (in the U.S.) are made up of poor people of color, the group whose health is the most vulnerable to toxic air emissions or accidental fires, spills or releases.[\[3\]](#)

In 2017, China was the world’s top plastics producer, with 11.88% of the world’s plastic goods made there. That year, China received 10.5% of all gas liquids exported from the U.S. The U.S. ranked third in plastics production (with Germany second at 10.7%),

producing 10.34% of the world's plastic goods from domestically-produced gas liquids. See [here](#).



World plastic production has been steadily increasing from 204 megatons in 2000 to 335 megatons in 2016.<sup>[4]</sup> About 39% of all plastic produced is used for packaging, materials that are non-durable and meant to be quickly discarded. The fate of plastic products after they are discarded is a growing concern to the global scientific community. Plastic recycling rates have always been low because, unlike paper, glass and metal, recycled plastics cannot be easily refashioned into products of equivalent quality. Of the 8300 million metric tons of plastic produced in the world since 1950, scientists estimate that only 9% was recycled; 12% was incinerated, and the vast majority (79%) has accumulated in the natural environment or landfills.<sup>[5]</sup> Four wealthy countries (the US, Japan, Germany and the UK) are the leading exporters of plastic waste. Most of the world's plastic waste ends up in China, Indonesia, Thailand or the Philippines where much of it is dumped on land, in rivers or in the ocean. This “distancing” of plastic wastes from wealthy nations to poorer nations disproportionately impacts the health of some of the world's poorest people, while making it appear to residents of wealthy countries that plastics are being successfully recycled.

In the ocean, plastic materials degrade into microplastics, which are consumed by seafood, putting the toxic materials in plastics into the web of foods that are consumed by people. Some of the substances in plastics have been classified as endocrine-disrupting chemicals, which at very low doses mimic the effects of estrogen in the body. Endocrine disruption can cause health problems such as insulin resistance, obesity, decreased male fertility, reproductive cancers, and neurobehavioral problems.<sup>[6]</sup> Testing of randomly

chosen U.S. residents by the Centers for Disease Control has shown that phthalates (chemicals added to plastics to make them flexible) are present in the bodies of 95% of the U.S. population.<sup>[7]</sup> If production and waste management of plastics stays the same, 12,000 million megatons of plastic waste will be in the environment or landfilled by 2050.

The plastics problem could be solved very quickly if binding international agreements were enacted, placing strict limits on how much plastic could be produced by each nation. But even without such an agreement, more could be done to break up the toxic relationship between fracking and the manufacture of plastics. Take-back laws that force plastics manufacturers to take back their products after their useful life are already in place in Europe for other products, and could be extended to plastics. Due to the toxic ingredients that make up plastics, the U.S. government could classify plastic waste as hazardous waste rather than solid waste. This would result in tighter regulation of plastics production, more careful procedures for recycling and disposal, and the cleanup of habitats polluted by plastic could be paid for under the Superfund program. And the United States could enact legislations similar to the European Registration, Evaluation, Authorization and Restriction of Chemicals (REACH). Having REACH in effect means that in Europe, the toxicity of chemicals must be evaluated *before* they are put into the environment. In the United States, chemicals are innocent until proven guilty by the government or those who were harmed. And if the U.S. ratified the Basel Convention Ban on the trans-boundary shipment of hazardous waste (provided that plastics were re-classified as hazardous waste), the deluge of plastics in U.S. landfills and incinerators would stimulate protest against the production of wasteful plastic items.

But even without these important changes, people everywhere in the world are fighting back against fracking and the toxic tide of plastic waste. Thousands of people have taken part in anti-fracking demonstrations. By popular demand, towns such as Beverly Hills, California and Ithaca, New York have banned fracking, as have the states of Maryland, New Jersey, New York and Vermont. [Fracking bans have been enacted in Bulgaria, France, Germany, Ireland, Romania and Scotland, and in New Brunswick, Canada.](#)

Protest against the problem of plastic waste has generally focused on a few items, such as plastic straws, plastic microbeads added to cosmetics, and single-use plastic bags. In the U.S., the Microbead Free Waters Act was passed in 2015, banning cosmetics manufacturers from adding microbeads to their products. Plastics corporations have fought fiercely against retailer fees for plastic bags or outright bans on them. But they are losing the battle as California and all counties in Hawaii have joined Kenya, Somalia and many European countries in banning or charging customers for single-use plastic shopping bags. Municipal bans on plastic bags are even more popular in U.S. and Canadian cities. The oil, gas and plastics industries will keep fighting for their right to produce as much toxic plastic as they can. But they will find it increasingly hard to continue as more and more people come to recognize the dangers of the fracking-plastics connection.



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## Seattle's Segregated Riskscape

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*Stacy Clauson (Department of Environmental Studies, Western Washington University)*

Emilio's voice cracked in response to our air pollution experience question. He's one of Seattle's thousands of soccer dads. Emilio recounted smelling and tasting metallic emissions as his son practiced in the Duwamish River Valley's Georgetown neighborhood. That voice carried both anguish and fear for a father living and playing in a different Seattle where small industries, railroad tracks, an interstate, and their pollution shared a border with his child's playground.

He and several other South Seattle residents shared their worrisome stories about living and playing on this "Emerald City's" southside during our research team's fieldwork in 2015. We use pseudonyms to protect their identities.

Emilio also feared that emissions from industrial facilities and truck traffic in his neighborhood will worsen the health of his son, who like many Duwamish Valley children, suffer from asthma. Conversely, Blake and his family live in Ballard on Seattle's Northside. They often play at Golden Gardens, a waterfront park where children run on sandy beaches or explore tide pools. Blake doesn't worry about air toxic exposure for his family. Childhood asthma rates in North Seattle are three times lower than the Duwamish Valley.



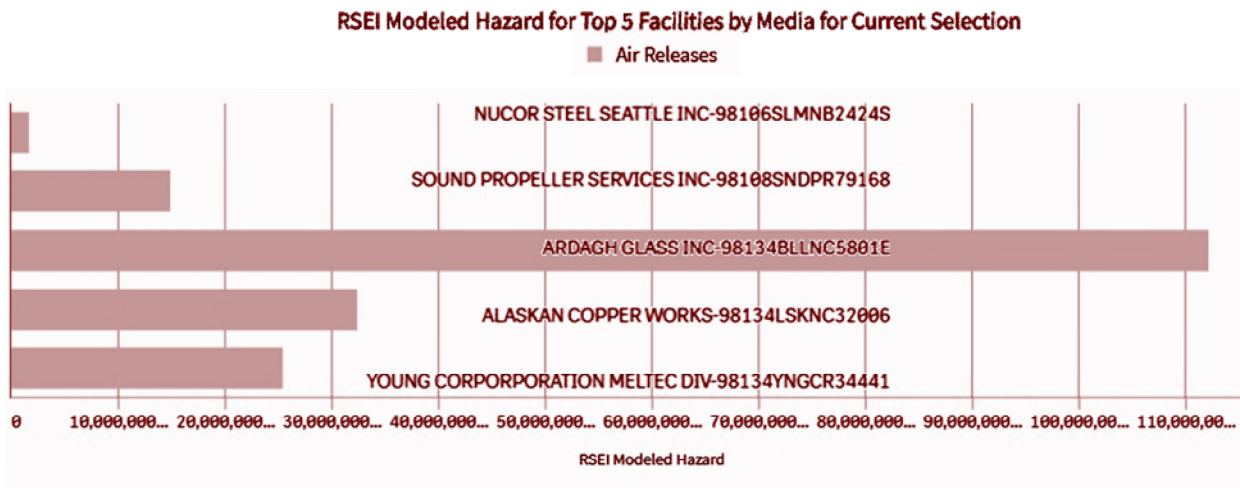
*This south facing photo captures several of the city’s iconic images including the Space Needle, downtown, and Mt. Rainer in the background. Seattle is well-known around the world as an archetype city for urban sustainability efforts that seek to achieve economic growth, environmental protection, and social equity. While in many ways these depictions of the city are accurate, a significant challenge exists across the city: environmental injustice. Beyond a clean and green facade earning nicknames like the “The Emerald City” or ecotopia, another reality exists where Southside residents face disproportionate exposures to industrial pollution and associated health disparities. (Photo courtesy of Larry Abel)*

Most Seattle residents and visitors often marvel at Seattle’s waterfronts, the surrounding evergreen forests, and views of snow-capped mountains. The iconic Seattle view above includes landmarks like the Space Needle and downtown juxtaposed against Mt. Rainer on the horizon. But, many don’t see or ignore one of Seattle’s most important yet polluted landscapes. The Duwamish River and its valley on the city’s south side forms the industrial heartland of the city. It’s also the center of Seattle’s segregated riskscape.



*This photo shows a view of the Duwamish River in South Seattle, WA with Mt. Rainier in the background. The water body is in the heart of the Greater Duwamish Manufacturing/Industrial Center (GDMIC) and was listed by the US EPA in 2001 as a Superfund site. A long history of heavy industrial activities along the waterway led to significant water and soil contamination, particularly in the form of polychlorinated biphenyls (PCBs), and resulted in the designation (Photo by Troy D. Abel and Larry Abel).*

For the decade from 2006 to 2016, 51 industrial facilities reported toxic emissions totaling over 392 million pounds according to data compiled by the US Environmental Protection Agency (EPA 2019). But, not all toxic air pollution is created equally (Abel 2008) and three of the smallest polluters by volume of emissions accounted for ninety percent of the city's relative risk for simulated inhalation exposures from toxic air emissions (EPA 2019). Ardagh Glass, Alaskan Copper Works, and Young Corporation each emitted less than 60 thousand pounds of pollution, or just 0.03 percent of the city's total, but they emitted some of the most toxic industrial air emissions like the Persistent Bioaccumulative Toxins (PBTs) chromium and lead. Therefore, South Seattle residents like Emilio now face a disproportionate share of the city's pollution risks. Conversely, northside residents face far fewer environmental hazards. How did Seattle's riskscape become so skewed?

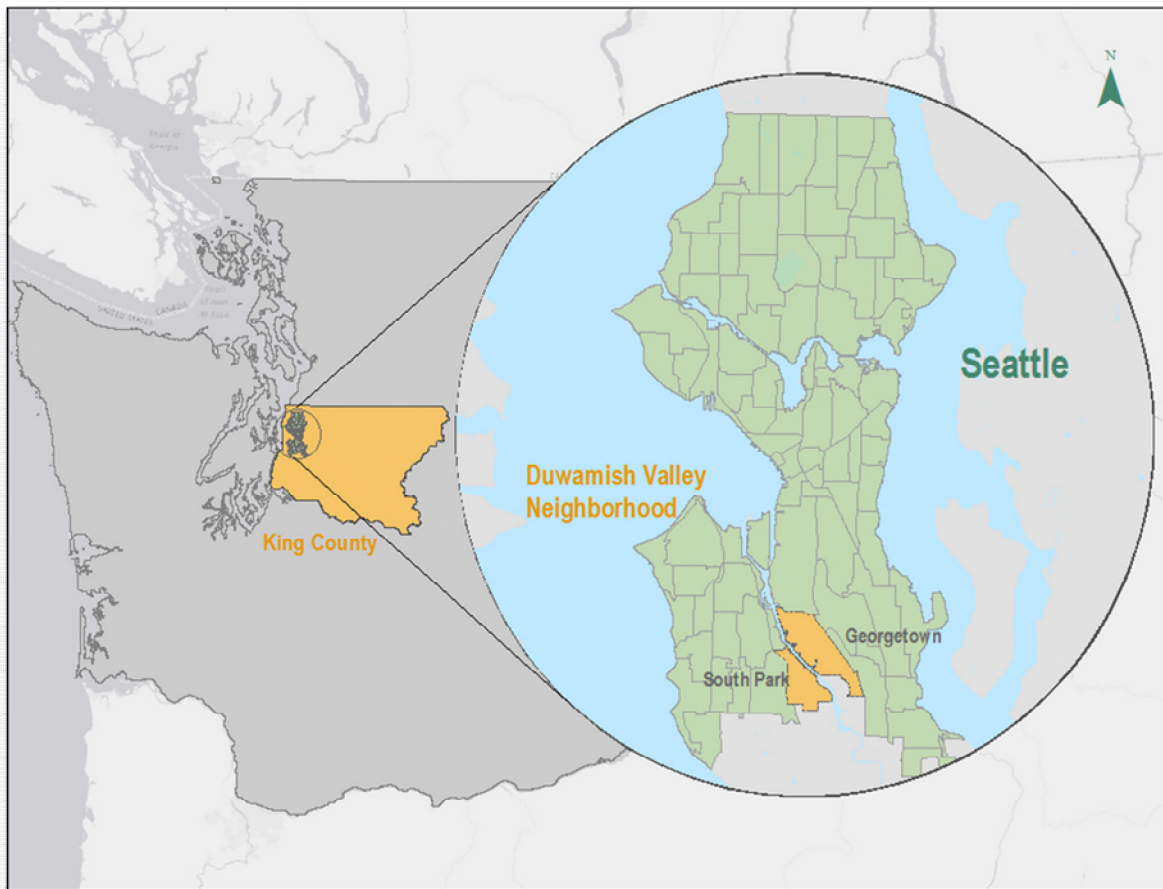


### A Tale of Two Emerald Cities

Seattle has been heralded for its sustainability, but its segregating reality challenges this reputation. Many parts of the city are flourishing with vibrant green spaces, good jobs and safe and secure housing. However, other parts of the city have fared much worse, with unsafe housing conditions, deteriorating air quality, and economic insecurity. The South Seattle neighborhoods of Georgetown and South Park in particular are on the highest end of the air pollution risk gradient and the lower end of the socioeconomic status (SES) and health gradient.

This post summarizes our research program on Seattle as a case study of environmental gentrification. We examine how rich households capture more of the benefits of a cleaner and more sustainable urban environment. Poorer residents become worse off. Gentrification is a growing challenge for Seattle. The equity and social impacts associated with land use competition are an increasing concern for many residents who face displacement pressures.

Fueling this competition, on the one hand, is the city’s shift toward a postindustrial, knowledge-based economy where well-paid, highly-educated “creative class” workers outcompete service and working class residents for urban amenities like cleaner air and natural areas like parks and waterfronts. On the other hand, the commitment on the part of city officials and policy makers to creating a clean, green and sustainable city also contributes to increased competition over urban space. While Seattle is an environmental leader among North American cities, the city’s river is the center of an Environmental Justice (EJ) struggle few recognize. Since 2007, researchers at Western Washington University have been studying Seattle’s invisible riskscape as a case study of environmental injustice.

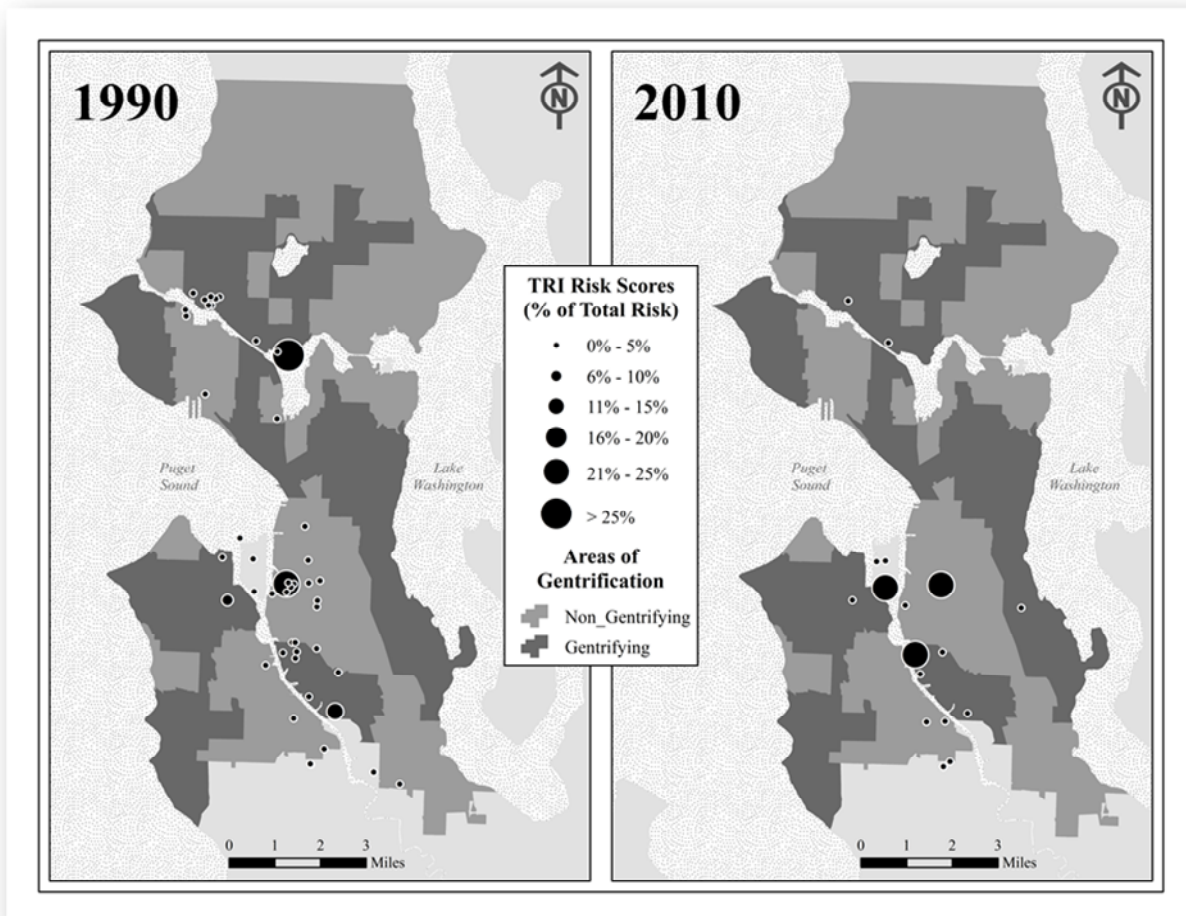


Environmental injustice is the result of the unfair treatment and meaningless involvement of people because of their race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. These injustices and patterns of environmental disparities have long been recognized in the US, but South Seattle trends also illustrate how these are intertwined with economic inequality and social segregation.

We found that both residential and industrial mobility contribute to a segregated riskscape of concentrated environmental advantages and burdens. Our combined application of the environmental science of relative-risk screening and geographic social science in a longitudinal analysis revealed Seattle's complicated yet intersecting trajectories of environmental inequality formation and socioeconomic stratification. Such historical considerations will be a crucial input in the larger research task of assessing urban sustainability and its health dimensions in the future. The Seattle case exemplifies the process of environmental inequality formation and joins the extensive EJ literature documenting urban environmental and health injustices across the United States.

In 1990, according to the US Environmental Protection Agency's Toxics Release Inventory (TRI) and the Risk Screening Environmental Indicators (RSEI), Seattle's air toxics exposure risk from industrial facilities was almost equally split between the industrial zones

of Ballard and Interbay in the north, and the Duwamish River Valley on the city’s Southside (49 – 51%). Yet, industrial facilities in the Duwamish Valley outnumbered Ballard and Interbay sites by three to one. By 2010, South Seattle polluters outnumbered those on the Northside by six to one. Facilities in South Seattle also accounted for more than 95% of the air toxic pollution risk burden by 2010. Industry and its pollution is being gentrified out of North Seattle while concentrating in the Duwamish River Valley.



Seattle’s socioeconomic divisions also are skewing. The 1990 median household income and home values were higher in non-gentrifying areas but over two decades, incomes and home values grew much faster in gentrifying areas. Whites fled non-gentrifying areas more rapidly while college graduates concentrated in gentrifying areas. In the Georgetown and South Park neighborhoods, median house values were \$100k lower than the city average in 2009 while poverty levels climbed from 1990.

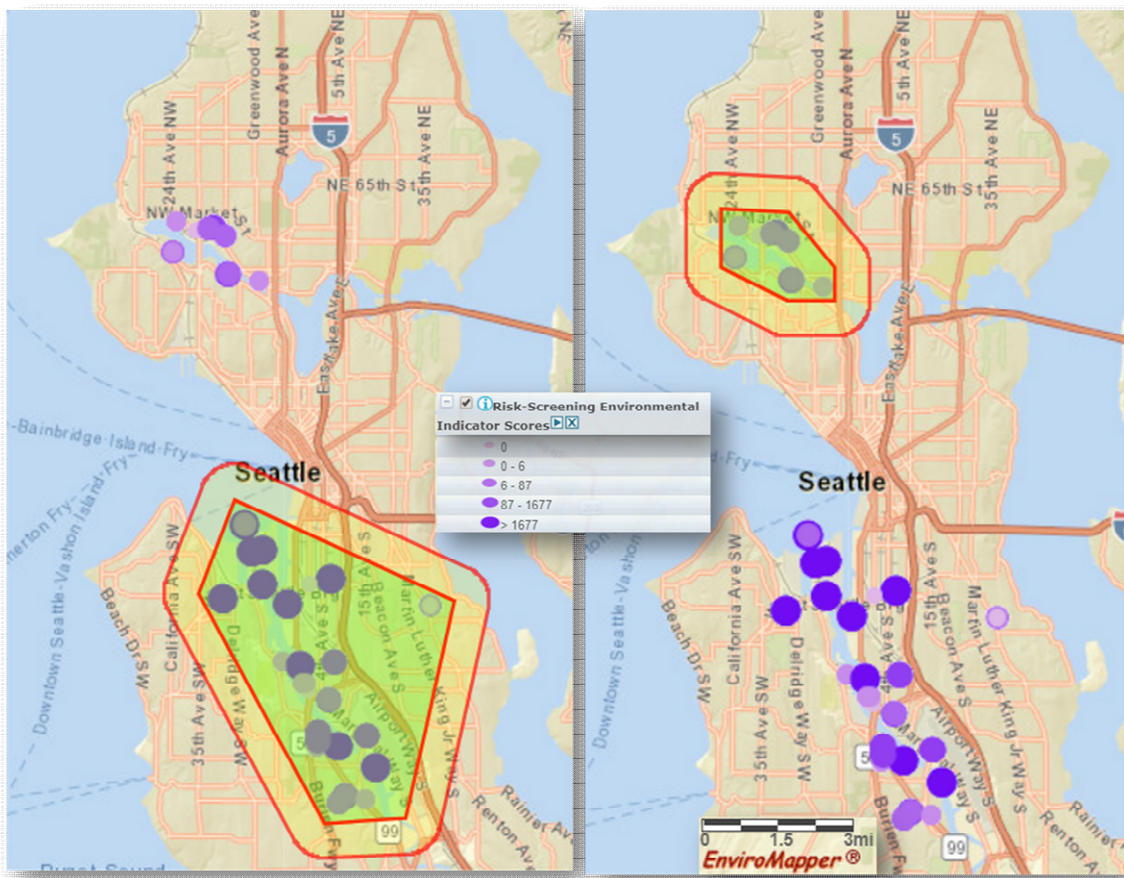
Cluster type	Percent college graduates			Median Household Income		
	1990	2010	Change	1990	2010	Change
Gentrifying	36.2	60.4	24.2	51,353	69,114	34.6
Non-gentrifying	37.4	52.3	14.9	55,425	59,826	7.9
<i>Seattle city</i>	<i>37.9</i>	<i>54.8</i>	<i>16.9</i>	<i>53,451</i>	<i>60,296</i>	<i>12.8</i>

Cluster type	Median home value			Percent non-Hispanic White		
	1990	2010	Change	1990	2010	Change
Gentrifying	205,144	429,924	109.6	73.8	71.6	-2.2
Non-gentrifying	243,426	429,874	76.6	72.3	62.2	-10.1
<i>Seattle city</i>	<i>239,198</i>	<i>446,900</i>	<i>83.9</i>	<i>75.9</i>	<i>67.1</i>	<i>-8.8</i>

### Concentrating Disadvantage

Moreover, since 2010, Duwamish Valley facilities in the 98134 zip code increased their air emissions. Similar to these worrisome industrial air pollution trends, other researchers find that transportation pollution also is skewed in South Seattle. For instance, the regional air quality agency attributed 70% of the extra cancer risk to Diesel PM in South Seattle (PSCAA).





But, Seattle's segregated riskscape clearest illumination comes with our application of the EPA's new EJ Screen tool (<https://ejscreen.epa.gov/mapper/>). We created polygons encompassing Seattle's two clusters of industrial facilities seen in the map above. Twenty-two facilities appeared in South Seattle's Greater Duwamish Manufacturing Industrial Center (GDMIC) polygon and 1 km buffer along with a population of 101,814. This cluster scored in the ninetieth percentile or higher in the state of Washington for some of the worst levels of diesel Particulate Matter (PM), Respiratory Hazards, Traffic Proximity and Volume, Superfund site proximity, and Hazardous waste facility proximity. The GDMIC area's minority population exceeded 58 percent placing it in the 89th percentile for the state. Thirty-five percent of the area's population also were low-income while eleven percent were linguistically isolated.

Conversely, only eight facilities were located in North Seattle's Ballard and Interbay Manufacturing and Industrial Center (BINMIC). This cluster saw none of its EJSCREEN measures exceed the 25th percentile for the state. Moreover, only 18% of the BINMIC cluster's population of 74,445 were minority, just 16% were low income, and one percent were linguistically isolated. Seattle's segregated riskscape results in many more minority and low-income residents being exposed to toxic industrial air emissions, diesel PM pollution, and higher emissions from greater traffic volumes. Such disparities illustrate the segregation of Seattle into two Emerald Cities.

Many EJ studies and official statistics tend to emphasize regional trends and aggregations. These perspectives obscure a class of toxic outliers and super-polluters that disproportionately burden low income and nonwhite communities with the worst of the worst chemical emissions. We join a growing body of research that reveals America's skewed industrial riskscape, linking it to the sociohistorical restructuring of Seattle's land use patterns and its segregated spaces. Socioeconomic inequalities and pollution disparities are worsening for Duwamish Valley residents.

The Seattle-King County Conventions Bureau adopted "Emerald City" as marketing slogan in 1982 when a California writer won a contest with the following submission. "Seattle, the Emerald City. Seattle is the jewel of the Northwest, the queen of the Evergreen State, the many-faceted city of space, elegance, magic and beauty." In his environmental history of the city, Matthew Kingle attributed this slogan as one source for the title of his 2007 book. The imaginary metropolis in L. Frank Baum's *The Wizard of Oz* was the second source. Among the core questions at the heart of Kingle's book was the following. "Why did the technically impressive and far-reaching changes to the physical fabric of Puget Sound generate an equally enduring landscape of environmental injustice?"

Our short answer to Kingle's question is that Seattle is home to the same kind of economic and social inequities seen throughout the United States. Urban geographer Richard Florida recently wrote about the US that "our cities, suburbs, and nation as a whole are splintering into a patchwork of concentrated advantage and disadvantage." Seattle exemplifies this pattern. Expectedly, our research shows that despite the city's improvement – overall – in mitigating pollution, low-income and minority groups do not enjoy these benefits and remain disproportionately exposed.

In other words, Seattle's pollution riskscape and urban development burdens have been skewed toward some of the city's most socially vulnerable residents. When one ignores or avoids these social and environmental injustices in Seattle, the city can be a magical and beautiful place. However, some neighborhoods in Seattle have fared poorly in all three dimensions of sustainability: environment, economy, and equity. A more just sustainability, instead of a segregating one, will require heightened political and policy attention to mitigate inequitable development and environmental injustice in Seattle and beyond.

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# Bodies Exposed: Reframing the Geopolitics of Dilution in Canada's Chemical Valley



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*Jen Bagelman (University of Exeter, United Kingdom)*  
*Laurence Butet-Roch (Ryerson University)*

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## **I didn't Know!**

*Poem by Ada Lockridge  
Aamjiwnaang First Nation*

I didn't Know that we had  
a say on what goes on in the plants

I didn't Know what was being released or how  
much or the Known health effects from it.

I didn't Know to call MOE Spills Action Hotline to report any  
unusual smells or happenings  
and to ask for a copy of the  
incident report.

I didn't Know that when  
there is a evacuation that  
I should check the wind  
direction and Know which  
plant it is so I can take  
the safest route away.  
(Do not drive with wind blowing  
At you.)

I didn't Know that it wasn't safe to swim or play in  
the St. Clair river or  
the ponds here, or ditches

I didn't Know it wasn't  
safe to eat the fish or  
the deer or rabbits here.

I didn't Know that I  
should keep my windows  
closed at night since the  
plants mostly burn from  
the stacks at night so as  
to not bother so many  
or something like that.

I didn't Know which government  
is responsible for what,  
still a bit ify on that too.  
Chief & council, Sarnia Mayor, St. Clair  
Township, Municipalities, Counties,  
Provincial, Federal, Health Canada,  
Environment Canada, Dept. of Oceans and  
Fisheries, Indian Affairs, Ministry  
of Environment, M.P., M.P.P.,  
Ministry of Natural Resources.

I didn't Know that those  
flares should only be  
burning when there is  
a problem.

I didn't Know that workers  
get some kind of a slip when  
they have been exposed to  
chemicals?

I didn't Know how hard it  
is to collect pensions?  
for the widows or disabled  
workers.

I didn't Know that when  
there is a power outage  
why we get our power back  
on so fast. (we are in more  
danger when the plants don't  
have power)

I didn't Know that the  
colors burning off the flares  
mean different substances are  
burning off.

I didn't Know that those  
beautiful colors of our  
sunrise and sunsets are due  
to pollution & chemicals.

I didn't Know that it is  
best to take water samples  
after the cities routine  
flushing. (And make sure they  
are testing for heavy metals)

I didn't Know that the watermain  
on S. Vidal is ours but the  
city maintains it. It is over  
60 yrs old and made out of cast iron.

I didn't know that when  
Suncor was building their  
1st flarestack that they  
were digging up human  
remains. ( I don't Know  
What they did with them)

I didn't Know that these  
Chemicals are used to  
make plastics, tubes in  
hospitals, make up, batteries,  
carpets, cooking pans, nonstick  
cleaning products.

I didn't Know the same  
companies here make the medicine for cancers and  
other ailments.

I didn't Know that there were  
noise and vibration laws  
for these plants

I didn't Know that some  
plants have a native  
hiring policy

I didn't know the plants  
Had native liaison reps.

I didn't Know they (plants) can  
do pollution credits sharing  
or selling (since they are allowed  
to release so much into the air?)

I didn't Know we sold the  
land so that industry could  
come, so that people would  
come to the area and  
create jobs (what was Known about  
chemicals then?)

I didn't Know that when  
the gov. had Indian Agents  
here supposedly taking care  
of us, that we were not  
allowed to have legal  
representation.

I didn't Know that there  
was a statistic that there  
should be 51% boys to 49%  
girl ratio worldwide.

I didn't Know anything  
about accumulative effects  
(I couldn't even say it till now, 2010)

I didn't Know that these  
Chemicals here can be  
passed on through generations.

I didn't Know that existing  
air monitors aren't set up  
to collect all samples that  
could be out there.

I didn't Know that when there  
is a release that you need to  
know what it is first so they  
know what kind of reading instrument  
to use.

I didn't Know that the  
workers are scared to  
report things fearing loss  
of job.

I didn't Know that workers  
have reported maintenance  
problems and they don't  
get fixed until they blow

I didn't Know that routine  
maintenance checks on  
holding tanks are only  
every 10 yrs.

I didn't Know that the  
riveted holding tanks  
are out of date.

I didn't know that these  
industries are still using  
some machinery from when  
they first came.

I didn't Know that there is  
a new law about pipelines  
being too close to homes

I didn't Know when the  
plants get fined that it  
goes to the municipalities.

I didn't Know that the  
plants have to give out  
1% of its profits to  
the surrounding communities

I didn't Know that people  
in a 1 mile radius of  
Clean Harbours receive a  
yrly "fee"

I didn't Know there was  
such a thing as a  
long term health based  
standard

I didn't Know that there  
is no standards here  
for some of these known  
carcinogens (these will cause cancers)

I didn't Know that Lanexss  
supplies the rubber that  
is in gum (I thought rubber tires)

I didn't Know that the city of  
Sarnia police don't have money  
in the budget to buy the  
proper gear for when there  
is road blocks due to  
chemical releases

I didn't Know that when  
Industry wants to change  
any of their operations or  
to add to it, they have  
to post it on the EBR  
website (Environmental Bill of Rights)  
and anyone has 30 days  
to comment on it.

I didn't Know that the  
gov. works by the four D's  
Deny, Delay, Divide,  
Discredit  
oh and maybe throw in a  
"study"

I didn't Know that  
medical doctors are  
not trained on how  
these chemicals react  
to the human body

I didn't Know that we  
probably need: oncologist,  
Epidemiologist, toxicologist,  
Meteorologist, pathologist.

## Dirty Stories, Toxic Bodies

Along the St. Clair River at the southern tip of Lake Huron, in the heart of the Great Lakes, Canada's 'Chemical Valley' – a toxic petrochemical complex – occupies Aamjiwnaang Indigenous territory. Approximately 2,000 Anishinabek people call this their home, which is now reduced to a small reserve due to land dealings enabled by public officials at multiple levels of government over the years. Stretching over 30 km, their territory houses the largest concentration of petroleum and chemical industry sites in Canada.

This toxic geography did not emerge by accident. Resource extraction in these territories began in the mid-19th century and in 1858, oil was first discovered in this region. From the discovery of gum beds in the Enniskillen Township in 1851, to the birth of the Chemical Valley in the 1940s with the expansion of Polymer Corporation following the Second World War, the power of industrial development has deep roots. Aamjiwnaang is entangled in wider processes of ongoing colonialism and neoliberalism. To this day, the extraction industry continues to envelop the Aamjiwnaang First Nation reserve.

In 2005, Ada Lockridge – an Indigenous mother, activist and citizen of the Band and former Council member – teamed up with researchers and discovered that for every two female births in her community, only one male was being born. This study triggered alarm across

multiple scales of government: local, provincial and federal. While the 2005 study could not conclusively attribute the community's toxic exposure to endocrine-disrupting chemicals, the federal ministry of Health Canada encouraged the formation of the Lambton Community Health Study. The Lambton County health department produced their own reproductive health report in 2007, which showed no abnormal birth patterns when scaled away from the Aamjiwnaang reserve to the county, a wider population of approximately 120,000 residents.

In addition to the abnormal birth ratio, over the years, Aamjiwnaang residents also expressed concern about high levels of autism, asthma, cardiovascular disease, miscarriages and cancer. These unique, site-specific concerns were not documented or addressed by the Lambton Community Health Study, which dilutes the Indigenous community's lived-experience and eclipses the colonial and neoliberal processes that constitute Aamjiwnaang as a toxic space. Official representations of the community, apparent in media accounts and public statements from external decision-makers, further obscure the ways in which the community actively contests these processes. Our main focus is not to simply problematize this limited representation but to instead call for a more multi-dimensional, prismatic account of Aamjiwnaang's everyday exposure to toxins and practices of resistance. Such a prismatic lens draws into focus multiple angles: academic, artistic, photo-journalistic and poetic.

### **Reframing the Geopolitics of Pollution: A Prismatic Lens**

To glean insight into, and shed light on the complexities of Aamjiwnaang's lived-experiences, we offer a close reading of this site through Michel Foucault's concept of heterotopia. A heterotopic analysis examines 'other than' spaces through multiple lenses to understand complex spaces and processes, and prompts viewers to look beyond the state to understand the inner workings of power, written onto the bodies of affected parties. The heterotopia rejects simplified dualisms and narrow narratives of victimhood. Instead, it offers a useful lens to deepen an understanding of multiplicity and contradiction. Such a prismatic approach allows us to trace the ways in which certain sites are simultaneously cloaked in darkness and left exposed. A prism serves to cast light upon the political ramifications that emerge due to this political spectrum of exposure.

While Foucault's approach is helpful, we argue that it is inadequate in illuminating the fulsome ways in which toxicity is intimately experienced, felt, and resisted. Drawing on Indigenous academics and activists, such as Leanne Betasamosake Simpson and Ada Lockridge, as well as feminist geographers, such as Rachel Pain, we argue that it is vital to dig deeper to unearth the lived realities of places rendered exposed, such as Chemical Valley. To do so, it is vital to become attuned to the everyday environmental injustices that constitute life in Aamjiwnaang which are too often invisibilized. Such an approach requires paying greater attention to the knowledges and situated stories articulated by community members which reveal various forms of, often slow, violence and also sustained acts of resistance. These knowledges are not confined to policy documents or even written accounts but range from documentary films, to rap music, dance and poetry. It is in the spirit of making greater space for these dynamic poetic knowledges that we begin this piece with the stirring words of Indigenous activist and poet, Ada Lockridge. For this poetic



work refuses to let us forget the smells, tastes, and sights that comprise a toxic body politics. It refuses for us to put aside, for instance, the polluted fish and sunsets that give rise to alarming cancer rates. Instead, Lockridge's work emplaces the reader squarely, and somewhat uncomfortably, in a toxic environment where — for a change — forms of colonial 'care' are made palpable and left exposed.

### Additional Resources

Bagelman, Jennifer and Sarah Marie Wiebe (2017). "Intimacies of global toxins: exposure and resistance in Chemical Valley", *Political Geography*.60(76-85).

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Pain, Rachel (2019). Chronic urban trauma: The slow violence of housing dispossession. *Urban Studies*

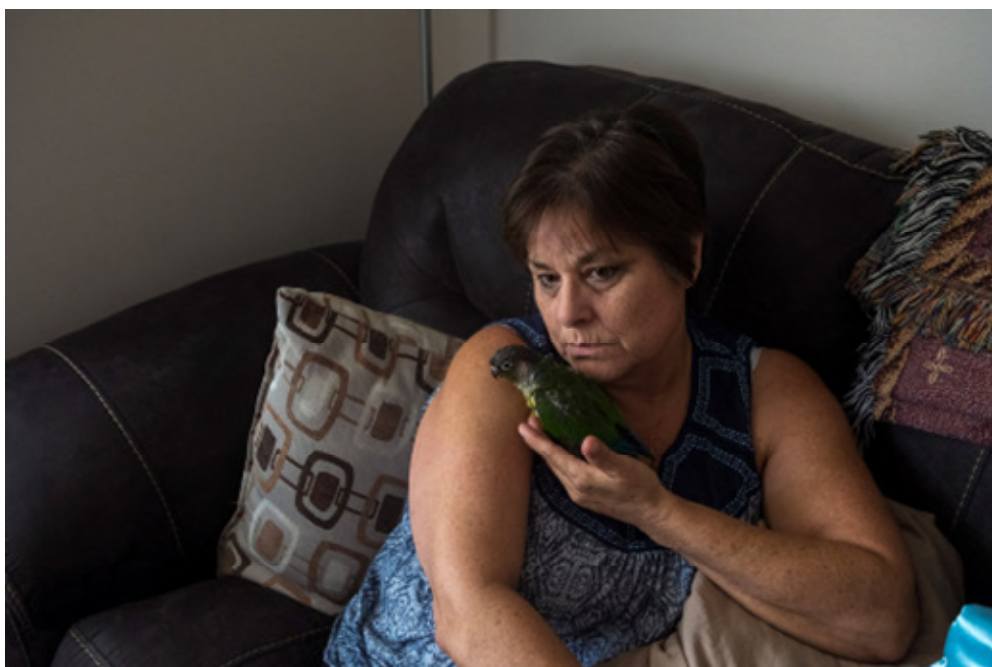
Simpson, Leanne (2013). *Islands of decolonial love*. Winnipeg, MB: Arbeiter Ring Publishing.

Wiebe, Sarah Marie (2016). *Everyday Exposure: Indigenous Mobilization and Environmental Justice in Canada's Chemical Valley*. Vancouver: UBC Press.

Photos from the series *Our Grandfathers Were Chiefs (2010-2018)* by Laurence Butet-Roch



01 Kids play with glow in the dark beach balls while waiting for the Solidarity day fireworks to start. The community's baseball field is located across from the Arlanxeo plant, which manufactures synthetic rubber. The products using their materials range from tires, to pharmaceutical injection vials and chewing gum. June 2016.



02 Ada with her bird Smee in her living room. Over the years, she has sent some of her pet's feathers to be tested by health professionals. It's one of many initiatives, along with toxic tours, bucket brigades and body mapping, keeping a spill calendar and overseeing a community health study, that she's undertaken to demonstrate the impacts of the surrounding industries on her peers' health. September 2018.



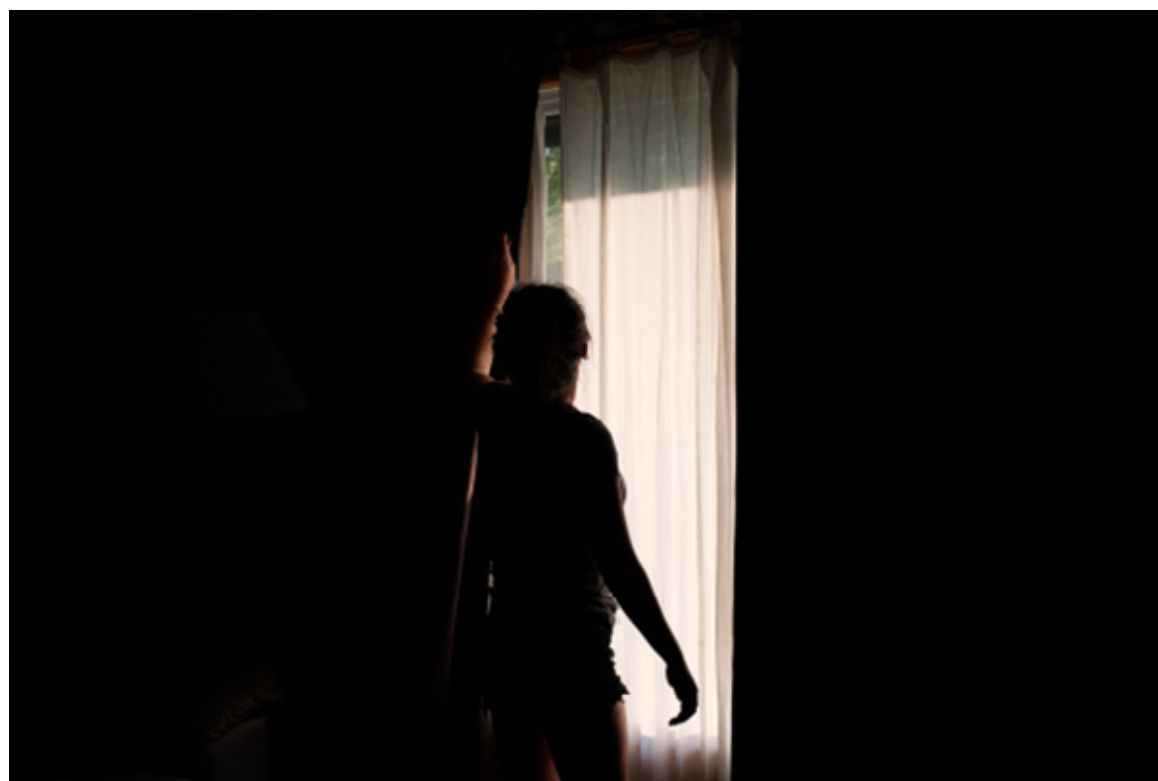
*03 The siren at the corner of Tashmoo Avenue and Christopher Road is meant to alert residents in case of a major leak or release of chemicals. When the siren sounds, residents have to listen to the radio in order to know whether to establish a shelter in place (stay home, close the doors and windows) or evacuate. August 2014*



*04 Jake Rogers on the shores of Lake Huron. August 2014.*



*05 View of the Shell Operations at Night. January 2015.*

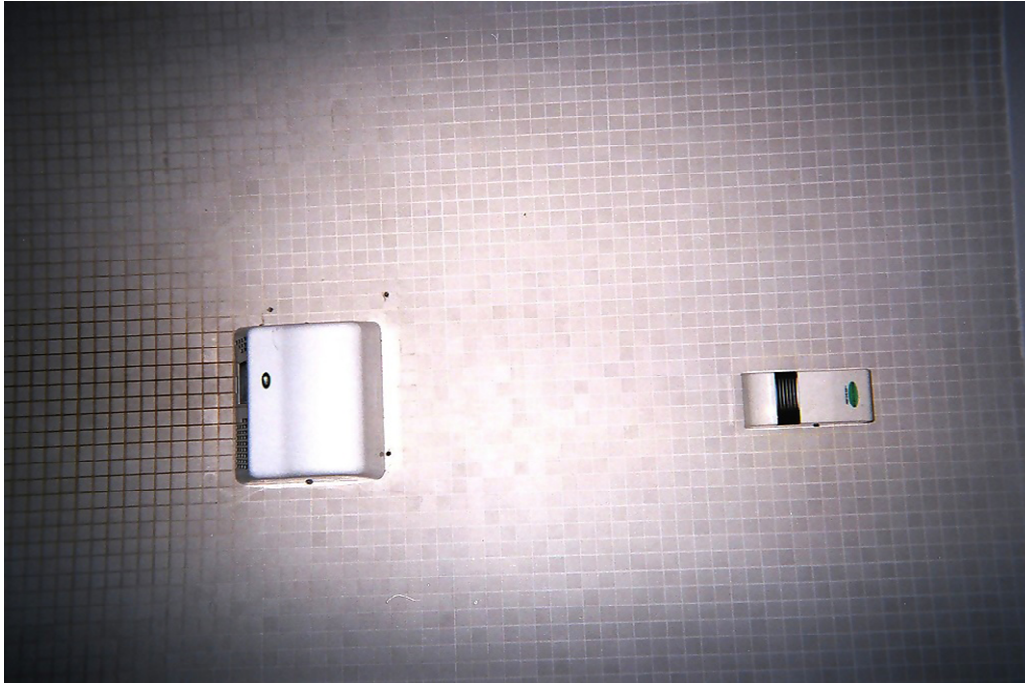


*06 Sadie Redmond closes the blinds as night falls. August 2014.*



06 Sets of postcards from Sarnia. From top to bottom: Imperial Oil Works published by W.J Proctor, circa 1900-1910; Aerial View Imperial Oil Refinery published by Jack H. Bain, circa 1945; The Polymer Corporation Plant at Night published by Jack H. Bain, circa 1945; Night View along Chemical Valley by Len Leiffer, date unknown.

# Tenacious Fumes, Chemical Sensitivity, and the Politics of Relation

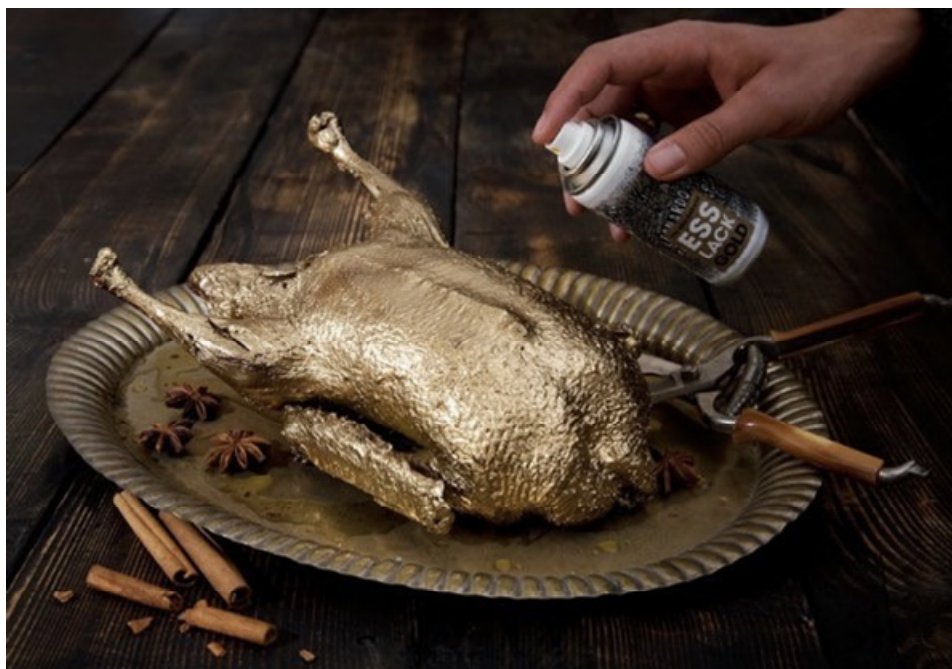


Sophia Jaworski, Doctoral Candidate in Anthropology, University of Toronto

*I speak with a visual artist who has been displaced from multiple residences and is sleeping in a minivan. On social assistance, she is in the difficult situation of trying to find a place to rent that is safe for her accessibility needs. She has intense nervous system reactions to cigarette smoke and fragrance, which, from her experience, most apartment buildings she can afford contain in large amounts. She explains to me that unfortunately many low income rental buildings have smells and odours that transcend hallways and walls, creep under doors, or leak through air vents and windows. In her van she uses tinfoil to prevent the off-gassing of the ‘new car smell’ that takes years to leave the plastic interior dashboard, steering wheel, and trunk space. She strategically places small piles of white baking powder to absorb scents that come in through the open windows. “I’ve gotten used to it now” she tells me, talking about how the weird looks she gets from people outside on the street, who peer into her home curiously.*

For chemically sensitive individuals, everyday spaces such as offices, supermarkets and buses contain exposures that cause reactions which last for hours or days. Many seemingly benign household products, home furnishings, and building materials actually contain small amounts of toxic chemicals that fugitively leak into everyday atmospheres, despite little being known about the long-term effects of low-level indoor emissions. Mounting evidence suggests that the release of petrochemically-derived chemical substances, as well as volatile organic compounds, pesticides, heavy metal dusts, fragranced personal care products, and cleaning products into the “exposome” of the

air (Wild 2005), such as through office renovations, roof tarring, cleaning sprays, or new furniture, has severe consequences. Products such as [gold food spray paint](#) elaborately wafting from a basted turkey immediately come to mind, but the culprits are really more ordinary substances like dish soap, lotion, paint, or diesel.



*An advertising image of a turkey used by company “Deli Garage” to market their golden food spray.*

In Canada, [over a million people](#), predominantly women, experience Environmental Sensitivities (ES), i.e., chronic multi-system physical reactions to even minimal amounts of toxic chemical exposure. Although it is little known, the population rate of chemical sensitivities in Canada (1.7%) [is comparable to all cancers combined \(2.2%\)](#). There has been a [31% increase in ES diagnoses between 2005 and 2010](#), yet environmental policies and toxicological paradigms continue to silo increased industrial chemical production from recognition of its effects on health and well-being. Studying the complex contexts of petrochemicals in Toronto, Ontario, Canada, I grapple with the uncanny reality of homes and workplaces as sites where bodily harm can be surreptitiously experienced in the midst of ordinary surroundings. I try to unravel the uneven relational politics of scenarios such as how smelling the perfume of a passerby on the street can make one person feel like they smell nice, and another person have a migraine and dizziness. How to contend with settings where one person who likes to smoke inside, means that another person in the apartment next door, whenever they are home just trying to relax, has difficulty breathing, body pain, and trouble concentrating?

While several EU countries and a few US states have regulations that inform consumers which commodities contain potentially toxic substances, Canada allows the unregulated commercial use of chemicals in homes and workplaces until proven toxic. The 2006 [Chemical Management Plan](#) has assessed 3,500 toxic substances thus far of the more than 80,000 in circulation, yet created risk management practices for only ninety out of 457 of concern. Current discourses frame perceptions of chemicals, as banal toxicity,

and these perspectives inherently preclude exposure prevention. Symptoms of severe toxic reactions are routinely [dismissed as psychosocial distress](#), despite how increasing reliance on the socio-economic value of toxic substances reconfigures everyday cultural practices in [gendered ways](#), and materially redefines the mundane slippages [between petrochemical and corporeal mediums](#).

As climate change activists have been asserting for decades, the environmental stakes of a human-altered world are reaching a fever pitch. Yet in Ontario, the failure of environmental issues to be taken seriously is demonstrated by Provincial government actions such [eliminating the independent, non-partisan office of the Legislature of Environmental Commissioner of Ontario \(ECO\)](#).

My research includes working with women who experience ES, specialists in environmental medicine, and housing activists. For us, it is crucial to disrupt the ephemerality of fumes, to articulate how the lifelong effects of indoor everyday chemical exposure do not occur in isolation. What questions can be asked when we take seriously how the reverberations of a stranger's perfume amplify constellations of vulnerability sustained by a climate of financial austerity and Toronto's citywide housing crisis?

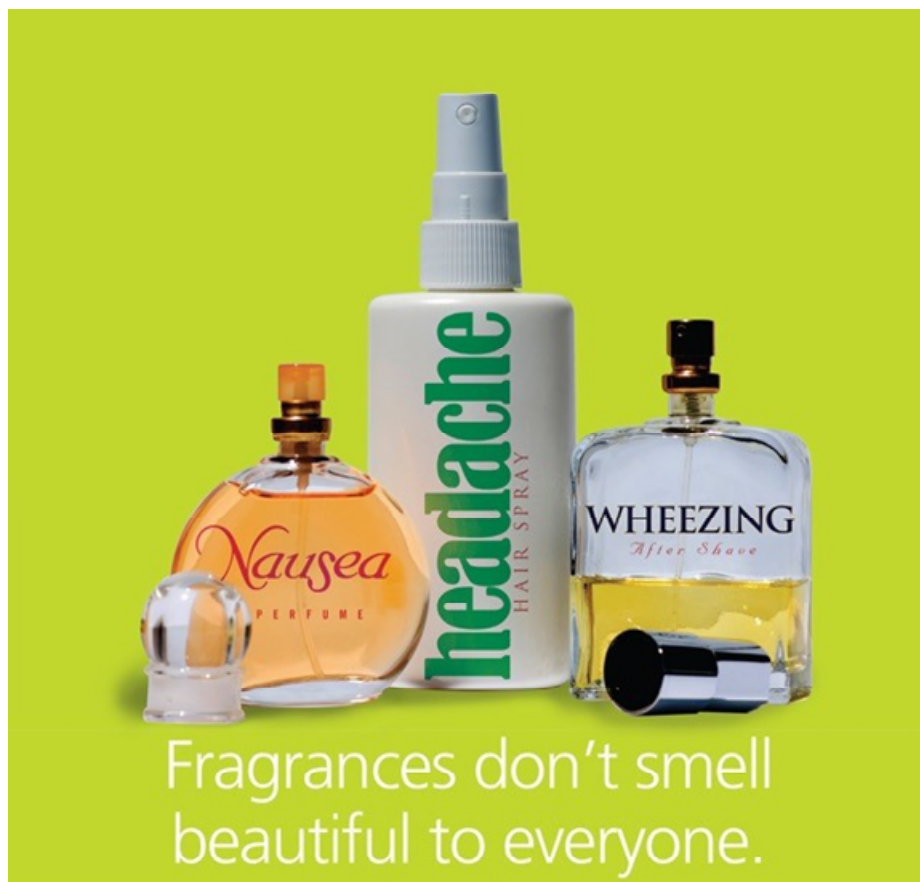
The challenge is to articulate the significance of everyday chemical worlds' toxicological legacies. Their permutations are complex, little understood, and highly contested. For many women, it is only after many enigmatic years of seeing multiple specialists and diagnostic tests when they come to link what they experience to ES. Difficult to tie to a particular event, chemical harm occurs slowly over time as exposures accumulate into what environmental medicine practitioners call an overwhelmed 'total load.' This term describes a sort of threshold reached by those with chemical sensitivities when the body can no longer successfully process toxic substances without adverse effects. Yet, it begs the question of rethinking how paradigms of "toxicity," "risk," and "exposure," reinforce [late-liberal notions of individual responsibility](#) that exempt industry accountability, and reinforce disparaging binaries of insides and outsides, sameness and difference.



*An image by artist Thilde Jensen from her book, [The Canaries of the home of someone with ES](#). Their cupboards are covered with tinfoil to eliminate off-gassing.*



Critiquing the established sociocultural values of common sources of everyday exposure is not straightforward, especially when chemically containing products such as personal care products, cleaning products, furniture, clothing, and household improvement products are embedded in rhetorics of self-care, material progress, development, and repair. Yet for those with ES, when these substances are avoided and removed, such as carpet backing cocktails, or [the daily average of 168 chemicals in personal care products is reduced](#), health improves dramatically. A chemically sensitive person’s ability to access to public spaces, including workplaces and public transportation, becomes contingent on strange negotiations around shared atmosphere, and attempts to control the amorphous trajectories of fume spirals as they emanate from the products they are embedded in. Most people are not aware chemicals with known or suspected acute and long-term toxicity to human, animal, and ecosystem life exist everywhere, sedimenting in us all the time.



Over one million Canadians feel sick when exposed to fragrances. That’s why, at Women’s College Hospital, we have a [fragrance-free policy](#).

**Please respect it** Wear fragrance-free antiperspirant, lotion, after shave and hair products while at Women’s College Hospital, and please do not wear perfume or cologne. Thank you.



*A poster illustrating the lived experience of ES used to enforce a hospital’s scent-free policy.*

If individuals with ES are lucky enough to have a workplace which implements a scent-free policy, may find that it is inconsistently, or rarely enforced. It becomes even more complex when navigating public transportation, or accessing a health care facility, navigating the hundreds and thousands of human-chemical clouds, crowds emanating extracted synthesized organic compounds distilled onto commodity objects, building materials, and their bodies.

The chronic progression of environmental illness and ES, especially when untreated, can lead to a high level of functional disability. The challenge remains, how can we name, and disrupt the wider implications that low-level, life-time, toxic chemical exposures have for being-together in the world? How does this intersect with feminist, anti-colonialist, and anti-racist principles? For women who cannot find safe housing, are displaced from their jobs, and cannot access disability benefits because their illness and or disability is not deemed legitimate, how do we resist displacement? How do we imagine otherwise?

Building on an [anthropology of late industrialism](#), I position the indoor embodiment of emergent classes of toxic substances, and burgeoning claims to toxic exposure, as central to critiques of historical exclusion of chemicals from social concepts of vulnerability, and relegation into cultural and political [non-places](#). At a time when scholars of our Anthropocene world are being called to interrogate how the settler atmospherics of urban colonization continue to reconstitute the relational terrains of municipal life in gendered, classed and raced ways, I extend this work to include the critical industrial cultural production of [chemical infrastructures](#) in the commodities and materials that are the matter of urban life.

There is currently the need for a radical approach to re-imagining our collective chemical futures amongst researchers and community members alike. Chemical regulation alone cannot bridge environmental justice and social justice, as well as critically address silos between public health, medicine, social policy, environmental law and conservation, chemical engineering and toxicology, and critical perspectives of commodity capitalism. Although it is important to think seriously about the sudden lack of appeal of grey jelly beans without artificial colours derived from petroleum, this is a systems issue that runs deep into our very perceptions of what commodity consumption means, what a right to housing means, and what a right to participate and access public space means.

The fights for human rights to safe housing by communities exposed to geographically endorsed proximities to toxic chemicals continue. While these struggles need all of our support to demand state accountability for this type of slow violence, the settings for such violence need to be broadened beyond industrial plants and factories that disproportionately affect the communities around them. Our understandings of chemical exposures need to include the spaces in which we spend the majority of our time, and the ways in which those spaces are materially composed. Certain occupations have higher likelihood of chemical exposure, and certain factors contribute to the ability to mitigate higher chemical exposure in the home, such as lower income. Refuting damage centred narratives that reify and depoliticize individuals effected by chemical exposure requires acknowledging our mutual permeability, the continuous relational fraying of public and private contexts, individual and community. Elevating the issue of petrochemical industry

profit requires that we continue to build allyship, resilience, and solidarity, across indigenous land and water protectors, grassroots community building organizations, activists, consumers, marketers, policy makers, stakeholders, and everyday people.

If infrastructures of petrochemicals alter the politics of relation, then tracing the complex everyday forms of lived intimacies with chemicals open new embodied understandings of an all-too-human conundrum: being at home in the world. These understandings do not promote the erasure of ongoing extractive colonialism by relying on [unproblematized universal notions of human subjects](#), but rather emphasize how uneven configurations of power, patriarchy, and capitalism are invariably involved in processes of prescribing chemical co-constitution to form, and in turn the co-constitution of our relation with the indoor geographies of everyday urban life.

# Contaminated Morals: the Struggle of Industrial Pollution in a Southern Italian City



*Angelo Raffaele Ippolito (United Nations University – International Institute for Global Health)*  
*Bruno Andreas Walther (National Sun Yat-Sen University)*

Between 2017 and 2018, I carried out ethnographic fieldwork in the Southern Italian city of Taranto. Being from the city myself, I was aware of the ongoing struggle between a small group of active citizens and the largest steel mill in Europe, Ilva (formerly Italsider), which since the 1960s has completely transformed the economy of the city whilst also bringing illness and death to its people.

The efforts of a few activists in the late 2000s have led to [one of the largest trials for environmental disaster in Italy](#), increasing the visibility of Taranto within Italian politics and calling for institutional action. Despite this leap toward environmental justice, there was something that simultaneously interested me as a researcher and frustrated me as a Tarantino. The environmentalist movement in Taranto became prominent only in the late 2000s, but the factory had been operating since the early 1960s. Even considering the recent environmentalist ‘victories’, the majority of the population in Taranto seemed to be largely disengaged from the environmentalist movement. On 14 April 2013, the people of Taranto were called to vote in a [referendum on Ilva’s closure](#). Among the 173000 people eligible to vote, only 19.6% casted their vote. By failing to reach the 50% minimum quota imposed by Italian law, the outcome of the referendum was nullified.

While a partial explanation of Taranto's environmentalist apathy lies in the dependency of the community on the jobs provided by the industry, I suspected that there are also wider historical and sociocultural structures that have prevented the community from taking action. What I found during my research is a community which seems to have largely resigned its willingness to fight for political change. However, some people have initiated a process of critical understanding of their own role within the political context they inhabit. This might constitute a different form of resistance which I will elaborate upon below.

## The Steel Planet

Let me first share two illuminating examples of how the factory and the associated narrative of industrialization have profoundly affected the shared moral vocabulary of the community. While these examples are not sufficient to explain the lack of public engagement with the environmentalist movement, they nevertheless serve as a reminder that the moral dimension of the community has also been polluted by the ideology which accompanied industrialization.

The powerful imagery of olive trees being ploughed down by bulldozers to make space for Ilva's industrial complex were made by Italian novelist Dino Buzzati in the [short film documentary \*Il Pianeta Acciaio\*](#) (1962 – The Steel Planet). This film was produced one year after the inauguration of the factory and described it as a source of economic and moral salvation for the people of Taranto, who had prior to its construction been condemned to civil and economic backwardness. The images and text stressed the notion of the community being not only economically, but somehow also morally inferior to the rest of modern Italy. Thus, in the midst of the merciless eradication of nature, the overbearing rise of giant factories, and the acclaimed construction of modern roads and homes, a new set of desires was also being fabricated for the community of Taranto. In the documentary, a voice-over describes the birth of the factory:

*“Away the olive trees, away the old little houses, away the cicadas and the ancient Mediterranean enchantment. The bestial machines want to turn everything into a desert, a flat land without a blade of grass. A few hours are enough to erase thousands of years, and now the beasts [the bulldozers] keep on paving the soil. Why did they do so? Because the olive trees, the sun, the cicadas meant sleep, abandonment, resignation and misery. And now, instead, men have built this huge cathedral of steel and glass so that it can become home to the fire monster which is known by the name of ‘steel,’ which also means ‘life’.*

*We are near Taranto, this is the new Italsider citadel, and one day it will become even bigger than Taranto itself. It's a metallic skeleton, and already produces giant steel tubes. In it, thousands of workers will find a stable job, tranquility and pride. Hundreds of them already work here, they came from the land, the pasture, the resignation. Today, they already think of themselves as different men, they feel alive and modern, they no longer feel a sense of shame or envy when they see the big trucks coming from Genoa and Milan driven by those Northerners and their*

*industrial faces. Now they think of themselves as equals to them, with the same strengths and the same capabilities...*

*Il Pianeta Acciaio – 1962*

Taranto's longing for modernity implied a revolution not only in the economic and social dynamics of the community, but also had deep effects on the very way its people perceived what really matters – what Kleinman (2008) would refer to as their *local moral world*. This superimposed narrative of the benefits of industrialized growth was internalized by the people who started to feel a need for the factory as a means to move forward. Becoming modern also required a profound cut with the agricultural past of the community, which acquired an inferior moral collocation. One of my informants recalled her husband's satisfaction with his job at the factory, which "gave him an identity."

The film documentary constitutes a distilled historical testimony of the extent to which the people of Taranto had to give up their own past in order to pursue modernity. It shows how the factory not only represents a material reality, but also stands as a powerful symbolic assemblage shaping the moral world of the community. Over time, the moral configuration of the community transformed according to the economic, sociocultural and political shifts in Taranto. Today, the community's morality shaped by the 1960s industrialization and its economic success clashes with the experience and information about illness and death in the city[1]. For this reason, the factory has been acquiring new symbolic connotations, now also embodying the struggle of the people of Taranto and their inability to voice their suffering.

### **Jesus Heavenly Worker**

The second powerful image which exemplifies the moral world shifted by industrialization is found in the Parish Church named *Gesù Divin Lavoratore* (Jesus Heavenly Worker) which stands a few hundred meters from Ilva's chimneys. Located in one of the most critically polluted districts of the city, the church constitutes a place for the gathering of the community. Above the white altar, there is a large mosaic that dates back to 1977-8. It portrays Jesus standing on the *Ponte Girevole* (the Swing Bridge), which was built in 1958, and constituted a milestone in the city's structural development. The bridge connects Taranto's factory to its people and their modern occupations: depicted are a navy officer, an engineer, a housewife, a construction worker, a factory worker, and an architect. They all stand facing the factory and the Son of God, looking toward their future, except for one of them, who is sitting down and directs his sight toward the observer. The fisherman is barefoot, and his clothes are not as neat as those of the people standing up. Segregated in the bottom left corner of the mosaic, he is meant not to look forward and thus is excluded from the modern future that awaits the others. Jesus points at the factory and at the sky, reminding the community that the industry is a gift from the Divine Providence, a means through which the community can finally rewrite their destiny of tradition and poverty and become modern. Jesus' hands also serve as a reminder that it is through hard work and dedication that the community can enter the Kingdom of Heaven.



*Jesus Heavenly Worker. Official photo*

One day, as I was chatting with a worker about that mosaic, he said: *“that piece of art is quite ironic. Forty years ago, people were sure that what Jesus meant by pointing at the factory and the sky was that, through hard work, people can have the privilege of going to Heaven. But now we know the truth. What he really meant was to be careful, because if you work at the factory you’re going to end up going to Heaven sooner than you should!”* Retrospectively, the consideration of the man still makes me smile, but it is also the perfect exemplification of how shifting moral understandings of the world produce significantly different interpretations of the same material reality, redefining the preexistent beliefs, economic conditions, and interdependences over time.

To me, the mosaic is more than a religious decoration; it rather constitutes a temporal window onto the moral world of the 1960-70s; it is a symbolic arena in which the community can reflect on the past world and create new understandings of their reality. A priest of the church used the figure of Jesus in the mosaic to critique Taranto’s ideals of work in the 1970s:

*“Now let me tell you something from a historical perspective and not from a religious one. I am talking about historical coherence and therefore about the fact that Jesus of Nazareth has worked until the age of 30, he was a real worker. This church was*

*born in the 1960s when in the Catholic Church there wasn't yet a lot of movement, hence they had the idea that Jesus should be represented wearing a white vest and with his hands open, without a single callus on his fingers. [Thus, in the mosaic,] It looks like he's never worked in his life. [...] therefore we can say that that mosaic represents the mentality and the culture of those years, a moment in which Jesus was seen as the Son of God and not as the Son of man. For the Catholics, Jesus is True God and True Man, but there isn't much of a real God in that mosaic..."*

Aside from the religious relevance of his personal view, the priest's critique encapsulates the moral transformation that the community has undergone in the last sixty years. First, it expresses a general hostility and antagonism towards a 1960s mindset avidly pursuing industrialization but still driven by traditional and backward morals. In the mosaic, the image of Jesus Heavenly Worker dressed in a white and spotless vest is a strong signifier of the social prominence of the workers and their occupation in the project of industrial development of the late 1900s. The ideal worker (represented by Jesus) utilizes hard work and sacrifice in order to gain access to Heaven, which here also stands for social recognition.

On the other hand, the priest's contemporary portrayal of Jesus defines a humbler identity for the workers (and therefore Jesus), stressing on the acceptance of suffering as a destiny that is not necessarily rewarded in an afterlife, but that defines the very essence of the human experience. This view is shared within the community, and reflects the current attitudes of the workers toward the pollution produced by the factory, namely a propensity toward enduring suffering rather than protesting it. Furthermore, according to most workers interviewed, the old mindset is also to be deemed accountable for today's degradation of Taranto's economy and its environmental destruction.

### **"The factory is within you"**



*Steel converters in the steel mill*



The two visual examples proposed above are ways through which the factory intrudes the subtleties of the social and moral life of the community and shapes their understanding of the world. One worker encapsulated this in the sentence “*the factory is within you*”, deeply affecting the very way individuals think and feel in Taranto. Ilva is therefore responsible not only for the physical degradation of the community, but also for a moral struggle that has divided its people over two generations, and that is partly connected to their inability to participate in the environmentalist movement.

At the same time, the community’s propensity toward self-reflexivity and the contemplation of the past described above echoes [Lora-Wainwright’s \(2017\)](#) notion of *resigned activism*, namely ways of remediating pollution that do not fall in the immediate spectrum of activist resistance, but that unveil the moral struggle of living in a contaminated world. This dimension needs to be acknowledged in order to reform our understanding of environmental justice in Taranto. Rather than promoting the participation of the public into predetermined forms of resistance, the focus should be on expanding the environmentalist movement into the moral struggle of the community. This requires restructuring the activist and political agendas, going beyond pollution and reflecting upon the *incommensurability of environmental loss* ([Centemeri 2013](#)), realizing that the spaces to be reclaimed are physical as much as moral.

All photos credit: Fausto D’Alessandro

**[1] The main polluting sources within the industrial premises today (the industrial park including Ilva and other factories) are the steel mill, a petrochemical plant and its refinery, the commercial harbor of Taranto, and an industrial landfill located north of the steel mill. From an epidemiological perspective, Taranto also has a demonstrated excess risk for a number of causes of death, among them: all cancers, lung cancer, cardiovascular and respiratory diseases, both acute and chronic. These risks can be associated to exposure to air pollution, specifically that of the polluted sites ([Pirastu et al. 2010](#)). Some studies have highlighted an excess of mortality in the areas adjacent to the industrial settlements ([Mataloni et al. 2012](#); [Pirastu et al. 2013](#)).**