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Fields Brook Superfund Site: Race, Class, and Environmental Justice in a Blasted Landscape

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Race, Class, and Environmental Justice in a Blasted Landscape

by

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Dedication

This work is dedicated to the people of Ashtabula—past, present, future.

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It takes an assemblage to write a dissertation. I am grateful to have been part of a fantastic assemblage.

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List of Acronyms

ACDL: Ashtabula County District Library

AOC: Area of Concern

APAC: Ashtabula Pollution Abatement Council

CDC: Center for Disease Control

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act

DNAPL: Dense non-aqueous phase liquid

DOE: Department of Energy

EPA: Environmental Protection Agency

FBAG: Fields Brook Action Group

GLLA: Great Lakes Legacy Act

NCBI: National Center for Biotechnology Information

NIDDK: National Institute of Diabetes and Digestive and Kidney Diseases

NPL: National Priorities List

NRC: Nuclear Regulatory Commission

ODH: Ohio Department of Health

ODNR: Ohio Department of Natural Resources

ODOT: Ohio Department of Transportation

OSHA: Occupational Safety and Hazards Administration

OU: Operable Unit

PCA: Participatory Community Art

PCB: Polychlorinated biphenyl

PRP: Potentially Responsible Party

RMI: Reactive Metals, Incorporated

SARA: Superfund Amendments and Reauthorization Act

USDA: United States Department of Agriculture

VOC: Volatile organic compound

Abstract

In 1980, the United States Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This federal law provided the U.S. Environmental Protection Agency (EPA) with the legal tools necessary to pursue polluters who had improperly stored or disposed hazardous wastes. Since its passage, more than a thousand sites have been added to the National Priorities List (NPL), but only a fraction have been cleaned up. Proponents of neoliberalism argue that aggressive environmental policies such as CERCLA harm workers by making it impossible for businesses to operate profitably. This coincides with a drop of nearly 50% in the U.S. manufacturing workforce since 1980, ushering in an ongoing era of deindustrialization, ultimately leading some scholars and public figures to worry about the advent of a "culture in crisis" in forming manufacturing areas of the U.S. and similar nations. In this dissertation, I draw on twelve months of fieldwork and 65 interviews to tell the story of one major property on the NPL: Fields Brook Superfund Site. Here, I use a mixed-methods approach to trace the assemblages, lived experiences, and practices that constitute a Superfund Site in a white working class community. Ultimately, I argue that experiences with chemicals give rise to new chemosocialities. One important chemosocial product of these interactions is white working class identity, forged by working in and around factories. I present the case that a more-than-human approach to studying environmental policy is necessary for anthropologists to understand how identity politics, citizenship, and lived experiences of toxicity overlap to produce new realities.

Chapter One: Hope in Blasted Landscapes?

Introduction: From Ash

"Hurry up or we'll be late!" my mother exclaimed as she rushed her three sons out the door of our one story, two-bedroom home in Ashtabula Township, Ohio. Like any other Sunday morning, we were on our way to Saint Joseph's Catholic Church, and we were running late. My mother helped my toddler brother, Matthew, with his shoes as Michael and I exited the house. When I walked outside, an unusual odor struck me. Since we lived about a mile from the county's industrial core, we were used to distinct odors coming downwind, but this was different—like someone had taken a garbage bin filled with rotten eggs and lit it on fire.

Then I noticed that there was something white on the ground. This thin, ashy powder was not snow; I cannot recall the season or even the year, but this was not winter. The powder was barely visible, coating the blades of grass and leaves on the trees. I looked across the driveway to our neighbor's home and saw that it was there, too, as well as in the vacant field across the street.

I walked to our white sedan and looked at the handle. I saw that it, too, had the white powder on it. I stood patiently—this was before the days of automatic locks, so I had to wait for an adult to manually unlock the vehicle. My mother and brothers eventually caught up, and she walked over to my door, preparing to unlock it with the key.

"What's that?" I asked her, pointing to the dust on the handle. She looked nervous, not the least because we were in a hurry to make it to Sunday mass.

"The factories release things sometimes. Here, let me open the door for you, don't touch it…" She inserted the key, opened the door, and rushed me and Michael inside, while settling Matthew in his booster seat. She took her spot in the driver's seat, started the engine, and exited the driveway. As she drove our Catholic cadre down the long hill on which Sill Road sat, I noticed that the white powder coated everything: trees, leaves, bushes, grass, homes, cars, lawn decorations. I also noticed that it became slightly thicker as we approached Middle Road.

With Jo Dee Messina's "I'm Alright" playing in the background, I asked my mother, "Why did they release this stuff? Is it harmful?"

"It's just dust, sweetie. It won't hurt you unless you touch it and then eat something." From then, I did not worry, but soon an odor caught my attention: the smell of burning rotten eggs grew stronger as we were closer to the industrial facilities. Unlike the dust, the odors were a common occurrence that punctuated everyday life. We kept the windows closed and tried to focus our noses on the air fresheners being blown by our car's air conditioning. The odor faded away as we entered the residential neighborhoods just down the street from the industrial core.

As we reached Lake Road, we approached the Ashtabula Lift Bridge. I looked down to see car after car attached to trains carrying black coal; in the distance, piles of coal framed the horizon just beyond the Coast Guard docks. Large spouts towering over the massive hills sprayed water down: it was a windy day, and the water helped prevent the spread of coal dust. We crossed the lift bridge and made our way over to the church, where I quickly forgot all my questions in the joy of seeing and hugging my grandmother. For decades after, I internalized that bizarre day as normal.

* * *

I do not remember when this anecdote took place specifically, but certain details (Matthew's booster seat, Jo Dee Messina's song, and the lack of automatic locks) indicate that it was sometime between 1999 and 2001, when I would have been between the ages of 7 and 9. This was the earliest awareness I can recall of the chemical industries that composed the backbone of my hometown's economy. I grew up in Ashtabula Township, a small community along the Lake Erie shores of Ashtabula County, Ohio. About two miles away from my childhood home are those factories that my mother told me about. At one time, there were nineteen different facilities in one clustered, industrial complex. Today, there are only six. This industrial zone rests on the cusp of Ashtabula City and Township. At one time, with a population of more than 35,000 residents, Ashtabula was a booming small town and a picturesque lake community. The City of Ashtabula exemplified all that a wholesome, family-oriented community was supposed to be in mid-twentieth century America. Residents who wanted more open land could migrate to neighboring Ashtabula Township. The rural lifestyle, good jobs, and lavishly funded Edgewood High School drew many like my parents out of the city. Residents of both communities often held secure, unionized jobs, if not at one of the Middle Road plants then at one of the other 40+ manufacturing facilities in town.

In 1969, that all began to change. The Great Cuyahoga River Fire attracted national attention as the cover story of TIME Magazine. On April 22, 1970 the first Earth Day protests occurred across the nation, pressuring national leaders to act to preserve local environmental quality. Less than three months later President Nixon created the U.S. Environmental Protection Agency (EPA), a federal executive agency designed to consolidate previous anti-pollution efforts by other federal agencies under one authority. While the early EPA was a toothless regulatory agency, the passage of landmark laws like the Toxic Substances Control Act of 1976 and the

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 gave it broad regulatory authority over industries. In 1986, the EPA listed Fields Brook, a tributary that drained the eastern portion of Ashtabula city and township, as a Superfund site. The economic logics and environmental regulations imposed by governments in the ’80s sparked the dissolution of Ashtabula’s industrial economy. By the time of my childhood in the ’90s, the first thermal treatment plants had been constructed on-site to destroy the Brook’s contaminated soil. Many of the old factories my grandparents and uncles had worked at had closed, most as a direct result of the aforementioned political economic *zeitgeist* of the 1980s. As this occurred, I saw a deterioration of my hometown’s economy. Within a few months, my mother lost her job at the auto dealer, and would bounce between positions for at least a decade as layoffs ebbed and flowed. Factory closures led into the Great Recession, when Barack Obama won the Presidency in part by appealing to disaffected factory workers in my homeland. The stress of just trying to get by, coupled with unhealthy lifestyle, led my father to have two heart attacks, in 2004 and 2010, before he eventually died of lung cancer in 2013.

From cradle to grave, intimate and institutional ties to chemicals have punctuated living for Ashtabula in multifarious ways. The scents and sounds of the chemical factories filled the air, coating our lawns with ash while simultaneously funding our schools. Families scheduled gatherings around whatever shifts our plant worker relatives were working that time of year. People’s politics were frequently tied to their livelihood behind the factory gates; one can easily connect both President Obama’s 2012 and President Trump’s 2016 wins in Ashtabula to their respective emphases on unionized labor. The latter has led to a sense of popular urgency among media pundits to “understand” places like Ashtabula; in fact, Ashtabula itself has been the focus

of multiple national media features linking deindustrialization and Trumpian politics (e.g. Malone 2016; Ewen et al. 2017; Lurie 2017; Lynch 2018).

Christine Walley (2009, 2013, 2017) has written extensively in auto-ethnographic form about her experience growing up as a white working class child of immigrants in suburban Chicago, Illinois. Walley's coming-of-age story of class mobility following the first wave of American deindustrialization is a seminal work in the anthropology of the white working class because it draws explicitly on the author's lived experience. Walley enjoys the dual privileges of intimate understanding of a group that, by her own admission, anthropologists have long ignored, while simultaneously receiving an education that afforded her the class mobility to articulate those experiences. Taking inspiration from Walley, it is my goal to use this dissertation to shed light on the white working class, especially in light of my own coming of age as an anthropologist in the aftermath of the Great Recession.

What is the "White Working Class"?

Before I introduce the field site for this dissertation, it is important to provide both national and global context. White working class identity is an ongoing process of meaning making in Ashtabula County, both chemically and metaphorically. I have already mentioned the so-called "white working class" in relating my own upbringing to that of Christine Walley's. The fact is that Ashtabula County, Ohio is filled with nearly 200,000 people who might be considered white working class, but there is no good operating definition for what this term means.

According to Christine Walley (2017), the "white working class" is a category that has historically referred to white laborers in Western nations whose educational attainment was a high school diploma or less and whose jobs entailed shift work for an hourly wage. While

Walley highlights the fact that modern economic realities further corrupt this definition—for example, anecdotally, my own spouse has a bachelor's degree and is receiving a master's, but works a job with an hourly wage rather than a salary—she and other authors point out that they have been obscure from the beginning. Historians (e.g. Roediger 1991; Hale 1995) have likewise cast light on the social construction of whiteness in the post-Civil War United States as a way of creating a winning political coalition for Democrats. During the early 20th century, many American manufacturing laborers were immigrants from European nations. While today most of these groups would be considered racially white, their original ethnic and cultural identities segregated them into different ways of living (Hochschild 2016; Feather 2017). After Reconstruction, Southern Democratic dominance depended on establishing a coalition of voters around a shared identity. The economic mobilization of working-class whites ginned up racial animus and provided for such an identity.

Walley's writing foregrounds the dearth of ethnographic attention to this social phenomenon among cultural anthropologists. Other anthropologists (e.g. Ortner 2003; Benson 2011; Westermeyer 2016) have used their research platforms to advance the anthropological study of mostly white Americans. Sherry Ortner (2003, 2) has called for anthropology to turn its lens inward and study the self rather than "exotic others." In recent years, anthropologists have focused increasing attention on issues in white working class communities across the United States (Willow 2014, 2015; Wylie 2018; Little 2013, 2014; Moberg 2002; Singer 2003). However, one factor lacking from most of these analyses is an explicit discussion of racial whiteness. Willow (2014, 252) comes the closest in discussing the fact that her research participants in Cuyahoga County, Ohio have historically enjoyed a sense of privilege in assuming that governmental and economic systems would always work in their favor; she

questions whether encroaching neoliberal environmental orders are expanding the groups of people who will suffer ecological consequences of human industrialism. Other political concepts that anthropologists have generated—such as Cooley and Casagrande's (2017) "energopower" and Benson's (2011) "plighted citizenship" allude to culturally distinct characteristics of the white working class, but do not discuss their roots in a racialized formulation of identity. To justifiably study the white working class, this analysis is necessary.

The impetus for studying the white working class comes from recent global events. The 2016 United Kingdom European Union Membership Referendum (also known as "Brexit") and United States Presidential election prompted a critical reflection on the conditions of our postcolonial, postindustrial world among anthropologists (see Edwards et al. 2017, special issue in *American Ethnologist*.) According to Rosa & Bonilla (2017), anthropologists have failed to engage the economic, technological, and cultural tensions that led to these two political inflections, thereby incubating the conditions for democracy in crisis. Anthropologists historically have concerned ourselves with "exotic others," resulting in a dearth of research on the relationships between racial whiteness and economic class (Ortner 2003, 2016). Some suggest it is necessary to decolonize anthropology by exploring the cultural diversity of groups we may not necessarily agree with—or even like (Graeber 2016; Bangstad 2018). Anthropological studies that dissect the formulation and employment of white working class identity must play a vital role in confronting contemporary deindustrialized, decolonized body politics.

The primary consequence of this research gap has been that other authors have stepped in to create the narrative where anthropologists have left a vacuum. Such authors often come from outside of the social sciences and humanities, and therefore do not necessarily present ideas with

the same degree of relativism an anthropologist would use. One such popular telling comes from the 2016 memoir *Hillbilly Elegy: A Memoir of a Family & Culture in Crisis* by Ohio-born lawyer J.D. Vance. *Hillbilly Elegy* was immensely popular in the immediate aftermath of the 2016 U.S. Presidential election, soaring to the top of the *New York Times*' Best Seller list. In the memoir, Vance recounts his childhood in Middletown, Ohio—located about 29 miles north of the Ohio-Kentucky border. Many center-left pundits considered Vance's narrative insightful as a means of understanding what many among America's educated classes considered a degeneration of culture among rural, poor whites. His conclusion—that people across the Midwest like his own family members lacked the "culture" necessary to succeed in today's globalized world—appealed to the implicit biases held by many educated, white liberals who, to paraphrase Hillary Clinton's oft-panned remark, saw places like Middletown as a "basket of deplorables." Vance's book draws on the author's lived experiences to promote a "bootstrap" narrative of upward mobility, reading as if Vance himself does not understand why everyone around him does not just go to Yale and become a lawyer as he did.

Also in 2016, American sociologist Arlie Russell Hochschild's *Strangers in Their Own Land: Anger and Mourning on the American Right* reached cult status among a similar group of readers to those who were interested in Vance's book. In contrast to Vance's memoir, Hochschild presents a thoughtful sociological ethnography of white working class conservatives in southern Louisiana. While *Strangers in Their Own Land* is a scholarly work and should be taken more seriously than *Hillbilly Elegy*, it still suffers from some of the same problems—namely, that its conclusions present unworkable solutions that merely parrot to readers what they already believe to be true. While her analysis of white racial resentment is revealing, it fails to historicize the problem by tracing the origins of those resentments. This leaves readers unaware

of the cross-racial relations under which conservative, working class whites formulate their identities.

More recently, Jonathan Michel Metzl's *Dying of Whiteness: How the Politics of Racial Resentment is Killing America's Heartland* (2019) has presented a biomedical/public health model for understanding a documented decline in white life expectancy and wellness in the United States (see Case & Deaton 2015, 2017; Malat et al. 2018). Like Hochschild's ethnography, Metzl's analysis provides compelling evidence that the white public health crisis in the U.S. is a product of racial attitudes. Like previous works, the book errs by neglecting to address the historical formulation of white working class identity as a product of political economy, race, and the environment.

Anecdotally, I find it impossible these days to read the news (I do not have cable) without running across some mention of white working class voters. Often, hosts will frame this discussion around the impending 2020 Presidential election and the apparent drift of Midwestern swing state voters away from the national Democratic Party. Democratic Presidential candidates including Joe Biden, Pete Buttigieg, and Amy Klobuchar have made their ability to appeal to the "white working class" a central theme of their campaigns. Democrats appear to live in a perpetual *Moby Dick* fantasy, chasing the Great White (Midwestern) Whale. The further reification of this monolith is detrimental: it assumes a moderate monolith of disaffected voters, when in fact the white working class is geographically, politically, and ethnically diverse. The fault lines of politics do not fall neatly upon rigid plates of identity. Rather, identities are entanglements that are the result of convergent forces and beings in one's life. Plighted citizenship (Benson 2011)—the predication of one's social role on emotional registers of abandonment—orients in relation to "others." The undeserving—particularly other races—are

imagined to be leeches on society that rob the deserving of their noble rewards (Cramer 2016; Castañeda 2019; Kline et al. 2020). White working class political identity has always been, and still is, about implicitly accepted categorizations of otherness, deservingness, and the nobility of work: where white work is a noble sacrifice, the work of working class people of color is the opposite.

Anthropologists from all subfields have important contributions to make toward resolving this crisis. As Rosa & Bonilla (2017) pointed out, our disciplinary preoccupation with exotic others has allowed us to cede ground to other prophets. The anthropological perspectives of holism and cultural relativism have much to contribute to the discussion of white working class identity formulation. The increase in recent anthropological scholarship on whiteness, simultaneously, must do more to engage its racialized and politicized history. This dissertation fills this important cultural and scholarly gap by providing an account of white working class identity that addresses its roots in factory life.

Situating Chemo-Ethnography

Chemo-ethnography (Shapiro 2015; Shapiro & Kirksey 2017) is a mode of ethnographic inquiry that begins by interrogating how novel social and cultural arrangements spring from human interactions with chemicals. Shapiro & Kirksey call the relations between humans and chemicals "chemosocialities." Chemosocial relations range from the intimate to the structural. The central proposition is that chemicals are a fundamental agent of human social life, capable of generating new kinds of culture. Here, I take this proposition seriously in framing an important contemporary question: what are the causes and consequences of deindustrialization among the

people who inhabit Rust Belt America? I argue that the answers begin and end with chemical interactions.

Chemo-ethnography represents a nexus in the development of a branch of anthropological theory alternatively referred to as "posthuman" or "multispecies." I prefer the nomenclature "more-than-human" because it acknowledges the non-Western roots of this concept (see Hallowell 1975; Viveiros de Castro 2013) and also clarifies that, rather than leaving humans behind, we are extending our definition of what it means to be(come) human. This emergent theoretical class has gained notoriety in recent years, particularly with the rise of the Anthropocene concept as a descriptor of large-scale earthly change wrought by humans (Raffles 2010; Kohn 2013; Kirksey et al. 2013; Latour 2014; Kirksey 2014; Moore 2015; Tsing 2015; Tsing et al. 2017). Donna Haraway (2008, 2016) and Bruno Latour (1991, 2005) are the foundational thinkers of more-than-human anthropology. Each has defined sociocultures as formations that arise from *becoming with* other beings (Ogden et al. 2013). In other words, what we know as human culture and social life is a product of navigating the challenges and affinities of intimate relations. Alex M. Nading (2014, 11) has said as much in defining multispecies entanglements as the "attachments and affinities" by which humans and nonhumans come into each other's worlds. This approach differs from other anthropological theories by framing human nature as something that, rather than being situated within any individual(s), is a transactional and ongoing evolution—one that may not even just be human at all.

In the opening, I described my own chemosocial experiences with the affects, social arrangements, and political economies of chemicals in my hometown of Ashtabula Township, Ohio. By framing my own auto-ethnographic experiences with factory life as chemo-ethnography, I am deliberately responding to Kim Fortun's (2012, 453) demand that

ethnographies of late industrialism be about "stag[ing] encounters." To accomplish this, it is important to talk about deindustrialization not as an abstract economic process that mobilizes human capital away from rural places, but as a fundamental reorientation of the kinds of intimate human and nonhuman relationships that structure everyday life. The "encounters" about which Fortun speaks occur at intimate and structural levels alike. For example, Ashtabula residents may or may not have directly experienced the contamination at Fields Brook, but whether or not they did, they likely came into being with it in other ways. Chemo-ethnography is a necessary development in anthropological theory to talk about these kinds of encounters because it emphasizes the role of what Anna Tsing (2015) has called the "unruly edges" of the Anthropocene in shaping cultural futures. Humans may have created the chemicals in those plants, but what happens when they do not stay within their prescribed and cultivated boundaries? Chemo-ethnography allows us to find the answers, whether they be embodied or affective, phenomenological or physical. In chapter two, I trace the evolution of this theoretical perspective in greater detail. For now, it is important to recognize that chemo-ethnography refers to ways of doing ethnography about chemical encounters.

Doing Critical Chemo-ethnography In/Of Late Industrialism

My dissertation is foremost concerned with representing the lived experiences of blasted landscapes, which are landscapes framed around unfairness or injustice. D. Soyini Madison (2005: 5) classified this approach as critical ethnography. Madison differentiated critical from classical ethnography based on a movement of concern from *what is* to *what is possible*. This shift in focus toward the anthropology of the possible mirrors chemo-ethnography's attunement to becomingness, making the two excellent partners in ethnographic theory. A critical chemo-

ethnography of blasted landscapes also must attend to Kim Fortun's demand that ethnography in/of late industrialism must be aimed at "stag[ing] encounters," (2012: 453). An awareness of friction (Tsing 2005) between self and study is essential.

Here, my focus is on staging encounters between industrial ruination and the persistence of life. The "blasted landscape" (Kirksey et al. 2013) of the U.S. Midwest embodies both the hopefulness and hopelessness of the Anthropocene. Ethnography in/of late industrialism is also about staging encounters with ethnographic subjects—in my case, the self-identified victims of environmental injustice. Such encounters present ethical challenges that anthropologists must resolve to provide fair, accurate, and empathetic representations of lived experience. Madison (2005, 5-6) furthermore asserted that one's positionality must be the starting point for conducting critical ethnography. Using this as my starting point, I describe the ethnographic ethical dilemmas I face in this section.

I begin from the perspective of someone who has lived most of his life in a blasted landscape. Ashtabula County, Ohio is not only my field site but also my hometown, where I lived for 18 years, and where I still have family and friends. My own background mirrors the ethnographic subjects in which I am interested: white, working class descendants of early twentieth century European migrants who came to work in the factories and on the docks. My family was Catholic; most of my mother's parents and four siblings and my many cousins (their children) had never attained higher than a high school diploma or GED, or migrated out of Ashtabula County. My father, like many other men I had known, died of lung cancer caused by years of chain-smoking Marlboro cigarettes. I have known family members and friends who have fallen victim to the ongoing opiate crisis. And of course, I have family and friends who voted for Donald Trump in 2016.

As a longtime resident of Ashtabula County, I am also familiar with its status as a blasted landscape in the collective imagination. My childhood memories are punctuated by chemosocial encounters: the weekly chemical alarm test every Wednesday at 11:00am; waking up on spring mornings to find a thin white dust that smelled like paint on my parents' cars; having to go inside one day while playing outside because a fog-like cloud of pollution had moved in; and a smell like a combination of cat urine and rotten cabbage driving near Fields Brook Superfund site. But I also have been a beneficiary of the polluting industries as the son of a mother who works in a factory that produces equipment used in unconventional gas extraction.

All of this means that I am writing from the perspective of a native ethnographer. This is a uniquely privileged perspective because it presents ethnographic opportunities to which an outsider ethnographer would not have access (Finn 1998; Rolston 2014). Native ethnography performs the work of decolonization by complicating ethnic notions of "self" and "other" that were implicit in earlier versions of anthropology (di Leonardo 1998; Jacobs-Huey 2002). Native ethnography is necessary if we are to answer Fortun's call to conduct ethnographies of encounter in late industrialism simply because capitalist expansion means that more ethnographers will grow up in late industrial conditions. My positionality as a native ethnographer therefore informs my positionality as a critical chemo-ethnographer, making this dissertation a form of situated knowledge (Haraway 1991b)

Native ethnography has moreover been a foundation of my anthropological identity. My Master's thesis at The Ohio State University investigated similar issues of environmental injustice. During my fieldwork, I found that my own lived experience was a powerful tool that I could leverage to gain access to informants. A key informant with whom I worked was an environmental justice activist who spoke frequently about the importance of developing personal

connections. He used a narrative based around his wife's death from a neurological disorder to recruit other activists. In much the same fashion, I drew on my own social networks of family, friends, and acquaintances, using personal connection as a foundation for understanding lived experiences.

Using such personal connections as a foundation for ethnographic research is not without complication. A central tension when conducting native ethnography is loyalty. Finn (1998, 22) and Rolston (2014, 29-30) have described the need to partition one's identities depending on conversational context when interviewing or observing close friends, acquaintances, and family members from one's hometown to maintain loyalty. Loyalty is a key social relationship implicated in two of the tensions I will observe: the tension between measurable and perceived risks, and the tension between globalization and its backlash. As anthropologists, all field relationships are inherently social, but loyalty extends beyond this because it is usually part of the rapport an anthropologist has already established. When conducting native ethnography, outcomes often demand such loyalty.

Modern risk and exposure assessment paradigms inevitably create tension between legitimate and illegitimate perceptions of risk. This tension compounds from the fact that many of the victims of environmental injustice are groups that have been historically marginalized in other ways. The ability of people in communities experiencing environmental injustice to leverage this unique positionality, or lived experience, has been instrumental in successful campaigns against pollution (Pulido & Peña 1998). In keeping with an anthropological tradition of elevating marginalized perspectives (Turner & Bruner 1986; Desjarlais 1994; Desjarlais & Throop 2011; Ortner 2016), environmental justice scholars seek to leverage positionality as a means of providing a voice to suffering communities. This commitment to representing lived

experience constitutes an expression of group loyalty that can be used to alleviate some of the tension of being a native ethnographer. I am uniquely situated to leverage my positionality in this way because of my own chemosocial experiences in Ashtabula County.

A second way in which my positionality becomes significant is through my role as an engaged anthropologist. There is a growing consensus among anthropologists that activist modes of research, rather than compromising ethnographic knowledge and integrity, are more intellectually rigorous due to their twin ethical commitments to fairly representing and improving the lives of people in marginalized communities. Melissa Checker and Maggie Fishman (2004: 8-15) contend that the objectivist paradigm sanitizes representations of culture by rendering uncomfortable truths about marginalized experiences invisible through taboo. They promote activist scholarship as a necessity to broaden anthropological knowledge. Charles Hale (2001, 2008) takes this further by asserting that anthropologists must empower our subjects at all stages of the research process, not just the dissemination of findings, to insert their experiences into academic discourse through control over their own self-representations.

Activist modes present limitations, however. In his response to Sherry Ortner's (2016) essay on recent theoretical trends in anthropology, David Graeber (2016) called attention to the fact that activist ethnographies usually only focus on groups with values aligned with anthropologists. Bangstad (2018) similarly calls this the conundrum of "doing anthropology with people we don't (necessarily) like." How can I create fair and accurate ethnographic representations of people with whom I do not agree about politics or perhaps even reality? With respect to risk, the solution is to focus on lived experience and not limit myself to notions of measurable risk alone. Theoretical imperatives demand that I consider risk as a phenomenological and material condition alike. It is also prudent not to embellish the power I

hold as an anthropologist or ethnographer: Melissa Checker (2014) cautioned that often, informants can misinterpret the economic status of the ethnographer as implicating connections or power that are not aligned with reality. When navigating tensions between legitimate and illegitimate perceptions of risk, this is an important line to be aware of, as I must be careful not to present myself to informants as being able to "prove" their lived experiences.

Representing the second tension—between globalization and those who wish to reject it—is more challenging. Rolston (2014: 30-31) critiqued the tendency for representations of the white working class to portray them as industrialized, oppressed others. This tension is implicit in the very term "blasted landscape." Furthermore, because I am interested in blasted landscapes as places of origin for the kinds of political change that motivate insurgent populist movements, an important ethical question regarding my dissertation concerns how I will represent these attitudes and beliefs. There has been an explosion of interest in understanding the causes of this global political upheaval. White working class voters are homogenized as conservative, lacking higher education, and generally opposed to multiculturalism (Walley 2017; Gusterson 2017). For example, around the time of the Republican National Convention in Cleveland, Ohio, a Cleveland.com editorial suggested housing delegates in trailers in Ashtabula (Larkin 2016). Such homogenizations ignore the fact that people in these places have a diverse array of values, class positions, beliefs, and backgrounds. Academics around me often speak of the white working class as racist idiots. My duty is to challenge this notion.

My goal is to produce representations of lived experience that are sensitive to all the possibilities of a blasted landscape. While I do not seek to generate disaster pornography, I want to evoke empathy through my representations for the exploitative nature of late industrialism. My hope is not to excuse sentiments of racism and nationalism through my explanation of how

they stem from blasted landscapes. Instead, my goal is to produce knowledge about how a group of people who have not traditionally been the focus of the anthropological gaze capitalism has left behind. The representations produced in my ethnography will hopefully contribute to a better understanding of the causes of risk society so that we can begin to restore trust.

About Ashtabula County and Fields Brook

There is no better place than Ashtabula, Ohio to study how racial conceptions of whiteness emerge from chemosocialities. As mentioned previously, Ashtabula County has been a focus of political punditry surrounding the 2016 U.S. Presidential election. A profile of Ashtabula County on the popular political website *538.com* deemed it one of several "new bellwethers" whose post-industrial, working-class population could swing an election. Indeed, Ashtabula County voted strongly for President Obama in 2008 and 2012, but swung to support President Trump in 2016 (Malone 2016). In 2012, President Obama of the Democratic Party received ~23,803 votes in Ashtabula County to Republican Mitt Romney's ~18,298. In 2016, Democrat Hillary Clinton lost Ashtabula County with 15,577 votes to Donald Trump's 23,318 (Ashtabula County Board of Elections 2012, 2016). Approximately 2,000 fewer voters participated in the 2016 election in Ashtabula County than 2012, but due to population loss the turnout rate actually increased. This discredits the notion that depressed turnout aided Trump, and suggests instead that he made real inroads with formerly Democratic voters. While Trump's electoral strength in Ashtabula County presented an inflection point that motivated scholars and the public to pay attention to crises of whiteness, the cultural and economic tides he exploited predate him. Rosa & Bonilla (2017) have urged caution among anthropologists not to provide Trump too much credit as a singular figure for a politics of whiteness. More broadly, scholars

(e.g. Lauck 2013) have directed a call for renewing scholarship on Midwestern culture and history partially as a means of explaining the conditions of modern global economic change. Thus, while I acknowledge that his election presented a unique historical moment that inspired attention, I will not devote extended analysis to his campaign, policies, or politics. Instead, it is important to look back further and understand *how* Ashtabula County became a place ripe for the incubation of such a political philosophy.

The name "Ashtabula" comes from the Lenape language, a group of Native Americans who were forced to migrate west from Connecticut due to European settler hostility; it means "river of many fish" or "always enough fish to go around." The name naturally was first applied to the large river these groups encountered, and still stands today as the Ashtabula River. In addition to providing the namesake for the county, there is also a City of Ashtabula and an Ashtabula Township in the northern part of the county. Throughout this dissertation, I will refer to the full name of each place to avoid confusion.

European settlers who displaced the Lenape upon arrival in northeast Ohio quickly established it as an integral part of the nation's extractive economy. Ashtabula's location at the

Figure 1.1: County map of Ohio. (ODOT 2020)

foothills of the Appalachian Mountains and the shores of Lake Erie made it a nexus for resource transport, facilitating the development of major urban cores including Cleveland, Chicago, and Detroit (Cronon 1991; Feather 2017). Throughout the 19th and early 20th centuries, the Ashtabula Harbor in downtown Ashtabula City was an increasingly important hub for steel manufacturing and transport. During and after World War II, numerous industrial facilities broadly owned and operated by the U.S. Department of Defense sprung up along the border of Ashtabula City and Township, about one mile south of the Lake Erie shoreline. Simultaneously, migration from southern and western Europe populated the burgeoning Midwestern landscape with people of different ethnic and cultural backgrounds. A 1984 study commissioned by the County Government of Los Angeles, California and conducted by consulting firm Cerrell Associates, Inc., found that Ashtabula County was not unique: communities with high ethnic diversity, especially European Catholics, were targeted by chemical companies as desirable locations because the lack of cohesive community ties and sense of desperation would, in theory, suppress opposition (Powell 1984; Zalimeni 2015; Hochschild 2016).

In 1970, the United States employed 18 million workers in manufacturing, comprising a third of its total population. Midwestern states including Ohio, Pennsylvania, Wisconsin, and Michigan were global hubs for extracting resources, processing them into goods, and disposing their wastes. Their cities and town were bustling centers of family life and progressive politics. Fast forward to 2019: the number of manufacturing employees in the United States stands at a mere 10 million—a loss of eight million, with five million of those eliminations coming since 2000 alone (Smil 2013). The decline in manufacturing jobs most affected places like Ashtabula County, where at one point as many as one in three workers were employed by extraction, manufacturing, or transportation industries, including railroads and shipyards. Manufacturing is a

deeply rooted part of Ashtabula County's history and culture: brakes used for NASA space shuttles, Hi-C juice boxes, Sherwin-Williams paint, uranium fuel rods for nuclear submarines, household pigments and dyes, and Chevrolet Corvettes are among some of the most widely recognizable products that have historically come out of Ashtabula County. Ashtabula's Harbor has been called the "world's greatest iron ore receiving port," receiving more tons of ore annually for many decades than any other port on Earth (Feather 2017). With many of these products no longer made in Ashtabula County and a drop to only one in ten residents employed in manufacturing, this part of Ashtabula's heritage is now a memory. How does a community change when a major source of its identity is obliterated?

There are four commonly cited reasons for the decline of U.S. manufacturing: automation, outsourcing, environmental regulations, and unionization (Smil 2013). The fundamental premise shared by each is that corporate entities act according to self-interest to maximize profits and minimize costs, choosing less-expensive means of production over outdated ones that are inefficient. Even as the number of manufacturing employees has dropped, U.S. manufacturing output has nearly doubled over the same three decade period, largely refuting the outsourcing hypothesis as a mere perceptive by-product of globalization. It is understandable that some may perceive that "nothing is made in America anymore" if they are exposed to more foreign products, unaware that the average consumer also purchases more total goods now than they did thirty years ago (DeSilver 2017). Furthermore, there is scarce evidence that unionization or environmental regulations have played any role in the decline of manufacturing. If anything, it has resulted in a more prosperous, lucrative industry that is able to attract and retain talented workers by providing them with a high wage relative to their

educational attainment (Smil 2013, 22; Vig & Kraft 2012). Instead, the rise in automated manufacturing is the cause best supported by evidence.

Despite evidence to the contrary, many in the public still blame globalization, environmentalism, and unionization for a perceived decline in American manufacturing. The growth of a global economic market coincided with the 1980s neoliberalism that also brought on automation, as corporatists and politicians espoused open international markets as the harbingers of global freedom. The environmental awakenings of the 1960s and 1970s, culminating in the first Earth Day protests on April 22, 1970, eventually spurred the passage of a major bill that forever altered the landscape of U.S. manufacturing. In 1980, following the events at Love Canal in Niagara Falls, New York, where a working class community resided atop a former dumping ground for chemical and radioactive wastes, the U.S. Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act, which gave the U.S. Environmental Protection Agency the authority to monitor and clean up hazardous waste sites (Layzer 2012). The key feature of CERCLA was the "polluter pays principle," which demanded the U.S. Department of Justice identify any and all identifiable liable parties and pursue them in court to pay for the cleanups (Vig & Kraft 2012). Properties at which the EPA determined hazardous wastes had been improperly stored or disposed were placed on a National Priority List (NPL) and designated "Superfund Sites." The NPL has designated more than 1500 in the forty years of the program's existence, most of which are still listed.

The majority of Superfund Sites, or Superfunds as they are sometimes called, are in urban areas, especially in the northeast and Midwest. Among Ohio counties, Ashtabula County is the only exurban county that has more than two Superfunds, with a total of five. Fields Brook Superfund Site, which stretches across Ashtabula Township and City in the northern part of the

County, is the focus of this dissertation. Fields Brook is a six square-mile watershed consisting of a main waterway and several tributaries that drains Ashtabula County east of the Ashtabula River and west of OH-193. The main tributary of Fields Brook was designated a Superfund Site in 1986 as the result of contamination from up to twenty different manufacturing facilities.

Why was Fields Brook selected over the other sites, and what makes it representative of a chemo-ethnography of U.S. white working class identity? While the other four Ashtabula County Superfunds have their own rich and fascinating histories of contamination, the story of Fields Brook holds greater significance in the cultural memory of native Ashtabulans because it is the only one of the five sites that is partially located in a residential area. Ashtabula County's four other sites—Laskin-Poplar Oil Company, Old Mill Property, New Lyme Landfill, and Big D Campground—are all located in areas that were once, or in the last two cases are still, scarcely populated. Fields Brook Superfund Site is also the sum of contamination from several different chemical production facilities, whereas the other four sites involved chemical storage and disposal only. Fields Brook, which was attributed to nineteen different corporate entities, presents a complicated mosaic of industrial interests, some of which employed more than a thousand workers at their plants at one time. Thus, many citizens had direct experiences with Fields Brook in one way or another: as an employee at one of those plants, a resident of the neighborhoods downstream, or someone in the community who worked or played near the brook.

Fields Brook is also a matter of personal significance. Members of my family worked in several of the plants designated Potentially Responsible Parties (PRP's) by the EPA, and some even owned property adjacent to the Brook. In 2001, when the cleanup of Fields Brook began, a new facility was constructed on Middle Road—about one mile from where I grew up. Named

Reserve Environmental Services (RES), the plant accepted dredged, contaminated soil from Fields Brook, incinerated it, and buried it in an on-site landfill. Nearly twenty years later, I realize that the ash I woke up to on that morning in the early 2000s was the cremated remnants of Fields Brook. This dissertation comes from ash.

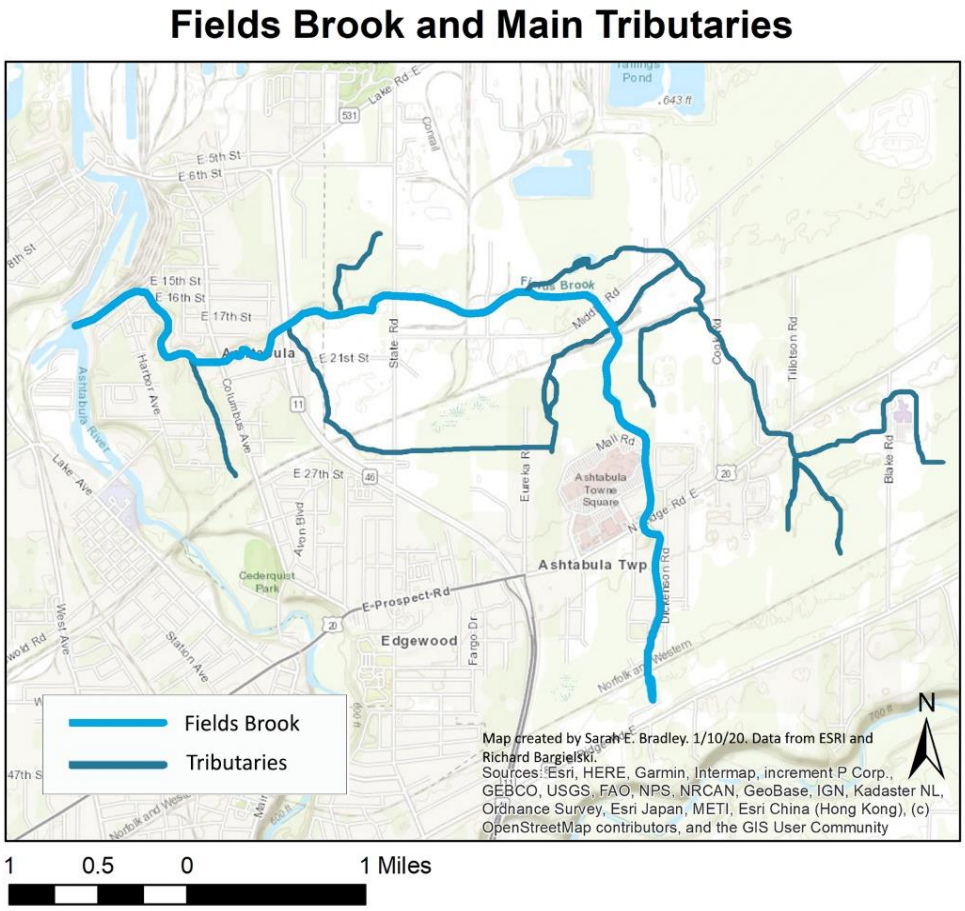


Figure 1.2: Ground truthed map of Fields Brook's watershed.

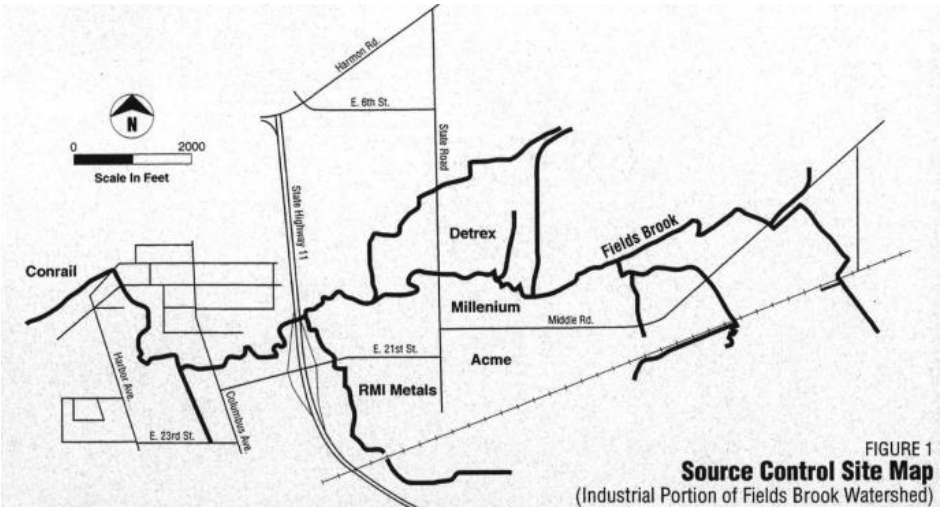


Figure 1.3: Map of Fields Brook Superfund Site. (U.S. EPA 1997)

Research Questions

A chemo-ethnography of white working class Americans living at a Superfund Site at once stakes out bold new territory, uniting novel theoretical and geographic interests in anthropology. Regardless of the findings and conclusions, a key task of this document must therefore be to demonstrate the utility and importance of not only chemo-ethnography and the white working class, but synthesizing the two. Studying the U.S. Superfund program provides a specific context under which one can observe the embodied, sociocultural, and environmental ways in which chemicals reshape Anthropocene landscapes. It is possible to trace the historicity and conditions of rural white resentment through Fields Brook because it was, and still is, a significant part of the collective memory of many Ashtabulans. Drawing on Beck's (1986, 1998, 2009) theories of risk, this dissertation approaches chemical exposures as something *socialized*: how do people come to (mis)trust companies, governments, and even fellow citizens when a toxic waste hazard is identified in the community? And, just as important, how does this shape their ideas and responses to institutions long into the future?

Three central questions guided my research on Fields Brook Superfund Site. First, *What are the more-than-human assemblages that constitute Fields Brook?* Assemblages have been variously described by anthropologists as wholes that are comprised of relations among parts (e.g. Deleuze & Guattari 1980; Latour 2005; Haraway 2008). Relationality, or how different objects relate in space, is a key concept of assemblage theory in social science. This question fundamentally asks about the different components of Fields Brook—humans, non-human organisms like animals and plants, chemicals, infrastructure, water, soil, and the Earth's forces such as tides—and how they come to be with each other in the world. Necessarily, it is important as well to understand the history of relations among objects and forces in Fields Brook. The goal of this research question is to construct an environmental history of Fields Brook Superfund Site that accounts for the agency of non-humans.

Second, *What are the embodied experiences of people who have lived or worked near Fields Brook?* An important part of identifying lived experiences will be coming to understand how human activity has altered Fields Brook, but how has the Brook, in turn, altered and shaped human life? How have chemical interactions played a role in the process? To understand how Fields Brook has shaped lives and attitudes, it is necessary to know what they know (or think they know) about the Brook. Having grown up in Ashtabula Township, I am aware of many of the urban legends surrounding Fields Brook, especially the infamous "cancer clusters" that supposedly existed in Old Swede Town, just a mile downstream from the industrial complex. The goal of this research question is to understand how people learn about environmental hazards in their community and how they respond to them.

Third, *What possible environmental futures exist for Fields Brook?* The concept of environmental futures has been articulated recently by an increasing number of anthropologists

(e.g. Mathews & Barnes 2016), indicating profound interest in theorizing how different imaginaries come to minds. Anna Willow (forthcoming) has proposed a five-point framework for understanding how people's experiences with extractive industries shape their (un)responsiveness. While some people who are exposed to the side effects of industry oppose and act against it, others live in support. Within Ashtabula, there is a notable tension between the two. Environmental activism has been a concern I was aware of in my community since my youth, but so was the strength and importance of our industrial economy. Having grown up with working class white family members who lacked college education and worked in many such factories, I saw the tensions between these two groups, especially as I grew up to be an environmentalist. What causes some people to act and some people to not? And what does this mean for the future of Superfund Site redevelopment going forward? These are important questions with broad applications, particularly as the United States EPA has largely run out of money with which to address Superfund Cleanups. The goal of this research question is to understand how people's experiences with, and perceptions of, a Superfund Site affect their imagined futures and the behaviors in which they engage to make those futures possible.

The three research questions proposed present a stepwise process for understanding how individual interactions with chemicals (hereafter referred to as "chemosocialities") inspire lived experiences that eventually give way to practice. They are structured so as to trace the effects of chemicals in shaping human realities, experiences, and imaginaries. Different experiences inspire different practices, and so each chemical contaminant of Fields Brook has a different chemosociality. The overarching goal of the dissertation is to explore how particular chemicals inspire different sociocultural attitudes and actions.

Research Methods and Data Analysis

I have adopted a perspective on risk that does not bifurcate real versus perceived risks, but instead treats different conceptualizations of risk as parts of the cultural imaginary that comprise Fields Brook. This dissertation will represent Ashtabula County using images, environmental histories, and lived experiences. The dissertation will be a form of "ethnographic storytelling" that "dwells in the connection between the documentative and the generative" (McGranahan 2015). Rather than attempt to present a dichotomization between "real" and "perceived" forms of risk, I consider all risks to be part of an assemblage of becoming in late industrialism. This crossing of perspectives is necessary to produce chemo-ethnographies that capture the lived experiences of toxic uncertainties in contemporary times (Goldstein 2014).

To construct an environmental history of Ashtabula and Fields Brook, I first turned to various databases and conducted extensive archival and online research on the subject. The U.S. Environmental Protection Agency has published more than 1000 documents in its Superfund Archives attached to Fields Brook; document types range from brief, half-page court documents to 100+ page environmental health assessments. I also read newspaper articles on Fields Brook, the Ashtabula industrial complex, the Ashtabula River, and other related topics published over the years. Because this is the online age, I searched the internet, and was surprised to find several blogs on Fields Brook and Ashtabula County's environmental problems.

I conducted the bulk of my research over a fifteen-month period between June 2018 and August 2019. During this time, I made four one-month long trips to Ashtabula, totaling four months of fieldwork: the first two trips took place in June and December 2018, while the second two occurred in March and June 2019. The first trip, in June 2018, was prior to IRB approval, and so focused exclusively on ground truthing and acquiring public archival data. A classic

ethnographic method, participant observation is excellent for documenting lived experiences because it allows researchers to immerse themselves in everyday life (Bernard 2011, 258-259; Schensul & LeCompte 2013, 83-88). However, there are modern realities that make the ideal version of participant observation both unrealistic and, in some cases, less useful. Within my own fieldwork situation, there were a number of challenges that made full time participant observation challenging. Practically speaking, it is difficult to observe a brook, or any of the locations at which the assemblage plays out. Study recruitment also poses a challenge in working class communities, as I found. Many of the people I talked with were enthusiastic to be interviewed and still keep in touch with me over social media, but they are naturally private people, and do not want to invite me into their homes or lives full time.

Furthermore, many of the people who grew up in Ashtabula between 1940 and 1990, when Fields Brook was at its height of contamination, have moved away or died. This is a similar problem to the one faced by Sherry Ortner (2003), who conducted an ethnography of her own high school graduating class, finding that many had moved all over the country. I resolved this issue by joining the Facebook group "Growing Up in Ashtabula" (GUIA). GUIA has nearly 15,000 members. The group is private: a group administration approves requests to join, and applicants must submit a short response to the question, "What is your connection to Ashtabula, Ohio?" I participated in this community daily, reading posts, commenting, and liking. I befriended people from all generations and walks of life. Some of these led to in-person meetings, and others to phone conversations.

I spent most of my first trip, in June 2018, ground truthing Fields Brook and the surrounding brownfields. Ground truthing is an observation-type method in which the researcher "sees for themselves" what it is like at a polluted site (Sadd et al. 2013). Emphasis is placed on

comparing experiences with data about each site. I ground truthed the totality of Fields Brook, including its tributaries, on two separate occasions, in June 2018 and March 2019. In addition, in May 2019, Ineos Pigments was gracious enough to give a brief two-hour tour of their titanium tetrachloride production plant and the steps taken to ensure compliance with EPA regulations that would prevent recontamination of Fields Brook.

One additional reason extended participant observation was deemphasized for this research is that, as an Ashtabula native, I already have a great deal of personal understanding of the community. This translates to several benefits, such as less time needed in the beginning phase of my research, when anthropologists frequently must take the time to get to know people and earn trust. Much of the trust was built on simply me being from the community. My activity in the Facebook group certainly helped. Some of the data used in this dissertation is therefore autoethnographic, building on my own memories and experiences growing up in Ashtabula. Autoethnography is not the centerpiece of the dissertation, but rather supplements the data obtained firsthand through engaged methodologies.

I conducted 65 interviews for this dissertation. Interviews were semi-structured, following a template of guided questions but allowing each informant freedom to tell the stories they felt were personally important (Madison 2005, 25; Bernard 2011, 156-186; Schensul & LeCompte 2013, 134-194). All of the interviews were audio recorded and then transcribed for accuracy. Most of the interviews took place in person while I was in Ashtabula. Several interviews took place in various locations around the country with informants who once lived in Ashtabula but since left it behind: three in Florida; two in Pennsylvania; one each in South Carolina and Georgia. Seven interviews took place via telephone or video chat. Interview informants included a range of professions and experiences with Fields Brook: doctors, nurses,

public health professionals, coroners, factory employees, EPA employees, local politicians, activists, business owners, librarians, scientists, historians, authors, journalists, teachers, divers, museum curators, college professors, and concerned citizens. Grounded theory, in which analytical codes emerge inductively from the ethnographic findings themselves (Bernard 2011: 535-539; LeCompte & Schensul 2013: 90-97), was the primary mode of analysis for interview data. A specific grounded theory called *in vivo* coding, which uses the informants' own words as codes, was employed in developing codes (Soldaña 2011; Leavy 2017). Once I had coded the interviews, I wrote short, one-paragraph summaries indicating how I planned to theorize the data and sent them to informants for feedback. Most either approved of my interpretation or did not respond, but a few offered constructive critiques. The resulting participatory coding (Hale 2008) provides informants a meaningful voice in dictating the terms of research findings and conclusions.

Finally, the project employed a visual ethnographic method known as participatory community art, or PCA (Leavy 2017, 207-209). PCA's goal is to provide a visual medium through which informants can express and then reflect upon their own ideas to elicit new data. Because conceptions of memory and its influence on imagined futures is a key feature of this dissertation, I chose this method as a way of engaging directly with the various junctures of temporality present at Fields Brook. The idea for this artistic collaboration arose while I was staying with my host family in Ashtabula in December: while doing fieldwork, I lived with the family of one of my high school best friends, Jarred. Jarred's brother, Ryan, is a professional photographer and musician with an interest in post-industrial landscape photography. Ryan and I traveled together to Fields Brook as well as Ashtabula County's four other Superfund Sites between March and June 2019. On the way to each site, I explained to Ryan its history and

significance, and he listened, asked questions, and took notes, using the information to frame his photography. After completing the photographs, we arranged an exhibit titled "A Photo-Ethnography of Ashtabula County's Superfund Sites" at the Ashtabula County District Library in August and September 2019. Twelve portraits, each with information about the various sites, were present, and attendees at the exhibit were asked to leave comments on a notecard indicating their impressions and reactions.

The variety of methods used in this dissertation comprise a mixed-methods mosaic. To fully understand the industrial assemblages that are Superfund Sites, it is necessary to have such a broad approach. A Superfund is an assemblage of chemicals, infrastructure, geology, ecology, people, nonhuman species, policies, capital, and more. Multiple methodological approaches are necessary to discern and analyze the different components; not all methods are appropriate for all parts of an assemblage such as Fields Brook. Table 1.1 below is a graphical representation of the relationships among research questions, methods, theories, and analysis in this project.

Table 1.1: Research question matrix.

Research Question	**Objective Fulfilled**	**Theoretical Framework and Literature**	**Data Collection Method**	**Method of Analysis**
1. What are the more-than-human assemblages that constitute Fields Brook?	Identify the more-than-human assemblages that constitute a post-industrial landscape	- Blasted Landscapes - Assemblage theory	Archival and database research Ground truthing	Content analysis
2. What are the embodied experiences of people living in and near Fields Brook?	Describe the embodied experiences of white workin class people who occupy post-industrial landscapes	- Risk society - Activism/protest - Whiteness	Participant observation Semistructured interviews Survey Autoethnography	*In Vivo* coding
3. What environmental futures are possible for Fields Brook?	Identify what kinds of futures are possible for post-industrial landscapes	- Environmental futures - Deindustrialization - Whiteness	Archival research Participant observation Interviews Participatory art	Content analysis *In Vivo* coding Participatory coding

Chapter Organization

Because this is a chemo-ethnography, I have placed emphasis throughout the dissertation on the relationships between people and chemicals. The goal is to demonstrate how particular chemosocialities shape the lived experiences of white working class individuals in the United States. This chapter, chapter one, is the introduction to the dissertation. Here, I have outlined the basic epistemological and theoretical approaches to my study.

Chapter two, "Chemical Frames," is a literature review of relevant concepts and studies in anthropology. The chapter reviews the history of studying landscapes, eventually leading to the concept of a "blasted landscape" (Tsing 2015; Kirksey et al. 2013). While anthropologists have only recently introduced concepts like more-than-human ethnography, there is a tradition within the discipline of studying environmental injustice in marginalized communities. This dissertation necessarily builds on and reimagines how these studies would look if they were chemo-ethnographies to support the necessity of this theoretical perspective.

Chapter three, "The River of Many Fish", describes the environmental history of Ashtabula County. I begin by describing the geologic formation of Ashtabula and surrounding areas, especially the natural resources available. I trace the impacts of settler-colonialism and early industrialism on present-day populations, filtering national policies and cultural trends to individual experiences. Throughout this chapter I emphasize the fact that environmental historymaking is a more-than-human process that entails humans, natural forces, nonhuman organisms, and chemicals.

Chapter four, "Trashtabula," continues the story of environmental history begun in Chapter Three. This chapter begins with the advent of modern environmentalism following publication of Rachel Carson's *Silent Spring*. I examine how national policies and paradigms

translated to the everyday lives of people in Ashtabula, shaping their experiences and perceptions of the world. Here, I introduce discussion of the Superfund legislation which profoundly shaped Ashtabula by designating Fields Brook one of the most contaminated sites in the nation. I also examine the impact and perception of cleanup and containment efforts, which are still ongoing in some parts of the watershed. This decline is embodied in the pejorative moniker "Trashtabula."

Each of the next three chapters emphasizes the role of a particular chemosociality. The chemicals chosen are only three of the hundreds that are known to have played a role in the contamination of Fields Brook. In my interviews, they were the most frequently mentioned and the focus of the most discussion. The three chemicals around which these chapters are organized are uranium, chlorine, and titanium dioxide (TiO_2). Each chapter proposes a different chemosociality, leading to a different reaction among locals.

Chapter five, "Violated and Furious," is the first of three chemical-focused chapters. This chapter emphasizes chemosocialities of uranium. I found that uranium was unique among Fields Brook contaminants, eliciting panic and fear that other chemicals did not. Because of its links to the Cold War, the prevalence of uranium triggered the concern of activists who linked it to pre-existing worldviews and efforts to mitigate the production of nuclear weapons. Reactions between humans and uranium at Fields Brook produced three waves of protest movements, culminating in support from the international group Greenpeace. Here, I highlight the fact that not all Ashtabula residents support industry, challenging the monolith of a conservative white working class.

Chapter six, "Better Living Through Chemistry," uses chlorine as a focal point for understanding risk perception and response. There are many different classes of chlorinated compounds which have contaminated Fields Brook. Chlorine is a catch-all to describe a plethora

of substances whose structures are based on elemental chlorine. In this chapter, I present ethnographic data on health and embodied experiences. I draw links to environmental health science data to suggest hypothetical causes for reported ailments. Here, I begin to develop what I call a concept I call an "Anthropocene body" to describe the changes in human biology that correspond with the ecological transformations of the Anthropocene.

Chapter seven, "Manufacturing Whiteness," is the final ethnographic chapter of this dissertation. In this chapter, I focus on titanium dioxide, a white pigment manufactured at a facility located along Fields Brook called Plant 2. Plant 2 has had various owners throughout history, but remains one of the only PRPs still in operation. Continuing my theorization of the Anthropocene body from chapter five, I here extend this to ask: what does it mean to have a *white* body in the Anthropocene? How do idioms of hard work and prosperity in an industrial town contribute to experiences and identities of whiteness? Furthermore, how does this translate to a transformed body politic, as I suggested earlier?

Chapter Eight, "Hope and Cancer," offers a conclusion in which visions of the future are punctuated by both hopefulness and hopelessness. I describe in detail the applied dimension of my research: the creation of a photo-ethnography and attempts to persuade local officials to change how Superfund Sites like Fields Brook are managed in Ashtabula County. I offer a template for how participatory community art may be used to elicit new visions for the future, spark conversations about community justice, and incite interest in learning more about contamination in one's own backyard.

Chapter Two: The Anthropology of Late Industrialism

Introduction: Chemical Frames

This chapter frames the anthropological discussion of federal environmental policy around the concept of a "blasted landscape." A blasted landscape is an environment that capitalism has irreversibly transformed. Blasted landscapes are constructed discursively in the cultural imaginary as a place of neglect, ruin, and abandonment. Blasted landscapes embody the emerging contradictions of late stage capitalism as they simultaneously facilitate both hopeful and despairing ways of life. In their essay "Hope in Blasted Landscapes," Kirksey, Shapiro and Brodine (2014) explore "the persistence of life in the face of catastrophe" (30). They are interested in the new biocultural possibilities that emerge from degraded environments. The narratives of despair that stem from blasted landscapes give rise to discourses of liberation and empowerment that can disrupt oppressive orders (Allen 2003: 48). At the same time, blasted landscapes are also haunted by "ghosts"—extractive pasts and uncertain futures hang over them like a specter (Tsing et al. 2017, 2).

In this chapter I trace the development of recent environmental anthropological literature on justice and toxicity, culminating in my own theoretical contributions to contemporary anthropological debates surrounding blasted landscapes. I emphasize the legacy of political ecology in influencing the environmental justice scholarship, while also acknowledging environmental justice's independent roles in grassroots activist movements across the United States. I devote particular attention to the foundations of more-than-human approaches to

environmental anthropology seek to present non-humans as relevant actors in human social life. Alternatively called multispecies or posthuman frameworks in anthropology, I prefer the term more-than-human for two reasons. First, it acknowledges the lengthy scholarly history on non-human agency that predates contemporary colonial theorists (e.g. Hallowell 1975; Viveiros de Castro 2013). Second, it recognizes the misnomer inherent in the term *post*human: we are not moving on from humans, but rather extending beyond them.

Throughout the chapter, I pay close attention to the role of environmental knowledge and experience in eliciting alternative trajectories. By tracing the relationships between imagination, experience, knowledge, and practice, I aim to show how particular conceptions of the environment over time have given way to material consequences that, in turn, have forced us to rethink how we approach nature. In concluding I situate my dissertation of late-stage capitalism in Ashtabula County, Ohio within the literature of landscape in social science. I accomplish this by showing how my dissertation contributes to an understanding of how new forms of knowing emerge from the embodied experiences of living in a blasted landscape.

Political Ecology and the Roots of Chemo-Ethnography

Chemo-ethnography draws from a broad body of work on political ecology in anthropology and geography. Contemporary political ecology outlines a "political economy of nature" (Splash 1995) in which decisions about resources, waste, and interspecies life are made within neoliberal and/or capitalistic frameworks. This is a response to accusations of reductionism in earlier social and cultural ecologies (MacCormack & Strathern 1980, 6). Political ecologists have produced a ranging body of scholarship on environmental degradation and subjectivity that is relevant foreground to the emergence of chemo-ethnography.

Contemporary political ecology synthesizes the approaches once regarded as the suite of "new ecologies" (Biersack 1999; Kottack 1999). Paul Robbins (2012, 20-22) has described a current political ecology research program focused on five areas: conservation, degradation, resistance, political economy, and environmental subjectivity. Categories within the program Robbins identified are not distinct and have significant overlaps: much scholarship classified as political ecology examines the intersections of the areas Robbins identified.

For example, Anna Tsing (2005) has called attention to the forms of friction formed when global and local subjectivities clash in these arenas. Friction between different ways of knowing and practicing in the world creates new cultural possibilities. One such friction is that between global environmental models and natural realities: scalable models, she observes, have become a global environmental knowledge regime, particularly in conservation and climate protection, but they are simultaneously in constant evolution due to a high failure rate (ibid, 101-111). Similarly, Paige West (2006) concluded that conservation regimes subsume culturally significant lifeways that alienate local people from their ecology, resulting in broader reconfigurations of community sociopolitics. West (2005) proposed translation across boundaries, especially boundaries of nature-culture and primitive-modern, as a means of flattening distinctions in applied conservation anthropology. Translation across frictions, then, is a key goal of contemporary applied environmental anthropology.

Knowledge, representation, and subjectivity are shown in each case to be important alongside global political economy in understanding conservation politics. At the other end of the metabolic chain are those anthropologists who have concerned themselves with the consequences of degradation from extraction and waste. Environmental justice scholarship in social science reflects the concerns that arose out of low socioeconomic status communities in

the 1970s and 1980s that they were subjected to disproportionate burdens of pollution where they live (UCC 1987). Environmental justice scholarship draws on a lineage of anthropological theory that emphasizes the lived experiences of individuals in marginal social status. Lived experiences of inequality are grounded in embodiment—the feelings and practices that define ways of knowing about one's self (Turner & Bruner 1986; Desjarlais 1994; Desjarlais & Throop 2011; Ortner 2016). The anthropology of environmental justice is notable for considering environmental issues as a distinctly social concern alongside other issues such as crime, poverty, racism, and economic change (Williams 2001; Fortun 2001; Checker 2002, 2005; Nash 2006; Willow 2012, 2014, 2016, forthcoming; Little 2013, 2014; Harvey 2015; Jalbert et al. 2017; Roberts 2017). Much environmental justice literature is focused on perceptions of risk and exposure as forms of environmental subjectivity.

There is also a growing area of scholarship on the political ecology of illness. Anthropological reification of the nature-culture dichotomy previously obscured significant environmental health concerns (Scheper-Hughes & Lock 1987, 8-10; Nading 2014, 7-16). Approaching social studies of illness using a political ecology framework provides insight into the role of such forces as place, discourse, and resistance in shaping who experiences what kinds of ills (Connolly et al. 2017, 5). Anna Willow (2015) has argued that such an attentiveness to the politics of environmental illness performs the work of deconstructing the nature-culture dichotomy. Political ecology's focus on the creation of subjectivity within complex networks of power is ideal for understanding experiences of environmental illness.

Political ecology may be distinguished from the apolitical ecologies of scholars like Steward (1955) because it is fundamentally concerned with the reasons for different levels of access to resources among populations. My own dissertation falls firmly within this broad area of

scholarship by addressing each of the major areas outlined by Robbins (2012). In this dissertation, I present a story of Fields Brook Superfund Site that crosses the borders of all five major subjects of the theory he identifies. The story of Fields Brook is one about translating subjectivities and political economies to produce a purified version of nature.

The Political Ecology of Risk and Environmental Justice

A major concern of anthropological political ecologists in the last two decades has been environmental (in)justice. Sociological studies of environmental justice elevated the prominence of the issue and provided a theoretical template for its analysis (Taylor 2000; Holifield 2012). As those anthropologists have turned their attention to matters of environmental justice, they have contributed an ethnographic and holistic perspective that elevates stories from the aggrieved.

Ulrich Beck (1986, 1998, 2009) developed the foundation for modern social scientific approaches to the study of risk. Beck called his theory "world risk society," arguing that an acceleration of the global liberal order had begun to undermine the promises of modernity by precaritizing our livelihoods. According to Beck, we are now entering a "second modernity" (1998: 2) characterized by environmental and social problems resulting from short-sighted decisions made during first modernity. Risk, generally speaking, can be thought of as the chance that something negative will happen. Beck's theory of a world risk society posits that we have manufactured a world in which risk has become the dominant environmentality (Agrawal 2005), informing ontology and practice.

Within anthropology, studies of risk and exposure are grounded in the political ecology of environmental injustice. Environmental justice movements focus on the uneven distribution of risks and benefits associated with modernist development and seek to balance these social

impacts (Low & Gleeson 1998). Such studies tend to focus on the interplay between risk perceptions measured by risk models and by those that originate in the sociocultural imaginary. While our culture typically assumes science to be authoritative and absolute, environmental health science is rarely either; yet, it still holds considerable sway as a form of legitimate knowledge.

When policymakers and publics reach opposite conclusions about the risks within their community, inevitable cultural tensions ensue. Environmental justice studies in anthropology are adept at showing how principles of risk and exposure interact with other discourses such as property rights, sustainability, economic development, and equity/equality. Melissa Checker's (2002, 2005, 2007) work in Hyde Park, Georgia provides an ethnographic account of how a mostly black community has come to perceive, understand, and respond to environmental risks in their "toxic donut." Checker reveals that environmental cosmologies in historically disenfranchised communities build on a foundation of Civil Rights tactics and ideologies. Environmental issues are therefore inseparable from social issues like poverty, crime, and racism because they are understood through a social justice framing that cannot exist without reference to them. As Checker eloquently stated: "Once they recognized that the environment threatened them the same way crime, drugs, and lack of education did, the environment became an ecological and a social concern that was compatible with other social justice goals." (2002, 100).

Scientific models for assessing risk rely on principles of *exposure*—whether or not an individual has come into contact with a harmful chemical or suite of chemicals—and *cost/benefit* analysis of the respective societal values versus the harms (Little 2009, 2014). Risk assessment science is based on economic, not ecological, models of behavior and therefore constitutes a social as well as ecological process. U.S. policymakers have developed a four-stage framework

for assessing the risks posed by industrial chemicals to human health: hazard identification, hazard characterization, exposure assessment, and risk characterization (Forkenbrock & Sheeley 2004, 102-106; Checker 2007, 114-115). However, as Checker (2007, 116-117) has pointed out, each stage of risk assessment is susceptible to bias: laboratory environments fail to mimic the multiplicity of the real world; contamination thresholds are arbitrarily defined and may vary based on individual biology; and it can be impossible to identify chains of interaction among multiple exposure pathways. There is a resulting tension both within risk assessment science and between it and public perception. Because risk assessment is a fundamental means by which U.S. policymakers make decisions, it plays a fundamental role in shaping our collective environmental consciousness.

Scientific principles and lay understandings of risk and exposure, however, frequently diverge. Environmental justice scholars have repeatedly noted the impact of sensorial experiences in shaping perceptions of and responses to risk. Nichter (2008) called this "sensorial anthropology," and while environmental justice scholars have not regularly cited his approach, they have nonetheless adopted it. Environmental justice anthropologists regularly explore the roles of sights, sounds, smells, and gut feelings in shaping cosmologies of risk. The risks that are felt by populations are irregularly recognized by risk management science. For example, the U.S. EPA permits the category "Brownfield" to include categories with *perceived* contamination present, but not Superfunds.

Environmental risk, then, is a risk category *additional to*—not *separated from*—social risks. Joan Martinez-Alier (2002) coined the term "environmentalism of the poor" to describe the risks low socioeconomic status people are subjected to as a result of their relegation to subpar living and working conditions. Indigenous environmental justice movements reflect this blending

of different categories of risk that make up the environmentalism of the poor by showing how modern environmental management regimes are inseparable from colonial history (Fortun 2001; Biersack 2006; Willow 2012; Salazar-Parreñas 2018). Risk assessment science relies on relations of trust between citizens and experts. Class dynamics exacerbate tensions over boundaries between measurable and perceived risk, resulting in proliferation of risk societies.

While many environmental justice studies document the cumulative impacts of industrial pollution over time in a community, some focus on the impact of specific events in transforming socialities. Drawing on Rabinow's (1996) concept of biosociality, in which social relationships are based on bodies and the ways in which they become known, Adriana Petryna (2004) coined the term biological citizenship to describe the policy regimes to which victims of the Chernobyl nuclear disaster in Ukraine are subjected. In Petryna's ethnography, risk is assessed according to the quantity of radiation inside one's body. Arbitrarily assigned thresholds differentiate the "contaminated" from the "un-contaminated." For those whose radiation thresholds are not high enough, assistance may be denied even with documentation of adverse effects of the disaster. Similarly, Kim Fortun (2001) has examined the aftermath of the Bhopal disaster in India as a case study in international environmental justice. Fortun conducted her principal fieldwork six years after the disaster, and so examines the lingering memories, fears, and anxieties of survivors. Disasters, Fortun argues, are often conceived as isolated events, obscuring our ability to see the complex causes and effects as interrelated (Fortun 2014). Instead, she encourages us to think about "late industrialism" as the unending series of disasters stemming from industrial pollution.

The impacts of late industrialism are not only seen on the bodies of women and racial and ethnic minorities. They can also been seen when examining economically marginal white

communities. This group is the focus of my dissertation and so it is important to recognize their place in the environmental justice literature. Environmental justice studies of whites contrast with those of communities of color because whites were in the ironic position of benefitting from as well as being harmed by industry. Once beacons of economic security and modern progress, polluting industries that once occupied the U.S. Northeast and Midwest have left behind chemical legacies that now trap and poison residents (Little 2014, 2-4). Hydraulic fracturing ("fracking" for short) has emerged as a hot-button issue of environmental risk. Drawing on Foucault's (2008) concept of biopower, Cooley & Casagrande (2017) describe energopower as a "logic of extractivism" that justifies the social costs based on economic benefits such as energy security and job growth. Placed in the context of the social good, energopower mandates that opponents of such risks are deemed un-patriotic for their opposition to these values. Anna Willow (2014, 253) called attention to environmental injustice in white communities as a hallmark of late industrialism, observing that "the appearance and experience of environmental degradation in unexpected places could signify significant systemic changes." In other words, an emerging environmental and class consciousness in white communities plagued by late industrialism is symptomatic of extractivist logic's insatiable appetite for growth. Willow (2015) has further observed that contemporary environmental movements places an increasingly twinned significance on advancing causes of ecological as well as human health; they recognize that "the environment" exists only in relation to the organisms occupying it, and thus see to integrate the two as part of a broader social justice paradigm.

Environmental justice scholarship is a useful template for simultaneously developing a scholarship of whiteness in anthropology. Although some of the anthropologists mentioned above have conducted fieldwork in mostly white areas, they have not grappled explicitly with the

relationship between environmental injustice and white racial identity. My work clearly contributes to filling this gap. However, the fact that scholars such as Checker have studied intimately the relationship between environmental justice and black racial identity provides a path for understanding how these conditions reinforce one another. I seek to expand environmental justice scholarship by theorizing the ways in which different kinds of social worlds come about in the shadows of industrial ruin.

Assemblage Theory

The emergence of environmental justice scholarship provided thematic unity to contemporary political ecology. As anthropologists developed this body of work, an alternate assemblage theory arose from the works of Haraway, Latour, and Deleuze & Guattari (Ogden et al. 2013). The emergence of assemblage theory proved significant to the development of political ecology because it emphasized multidimensional relations in which nonhumans could hold power over the trajectories of human social life. Here, I treat the assemblage as the fundamental unit of analysis: Fields Brook is an assemblage. But what does it mean to examine an assemblage?

Deleuze & Guattari (1980) defined social assemblages as ultimately fluid, exchangeable, and multifunctional wholes composed of people and things. The three characteristics of an assemblage do not explicate a prior separation of humanity and nature, but their basic nature asserts it regardless. Assemblages reject the human-nature dichotomy by pointing out that what we consider nature (or non-nature) is at once mutable and relative.

In her landmark essay on the proliferation of cyborgism in modern society, Donna Haraway (1991a, 151-153) explored the consequences of what she called the “cyborg myth,” the

false separation of humans from non-human nature. Haraway pointed to three false dichotomies that exemplify this myth: humans versus other organisms, humans versus material objects, and physical objects versus ideas. In so doing, Haraway argued that modern society has created a proliferation of cyborgs, or entwinements that defy the binaries she identified. These cyborg configurations must be considered a vital part of social life because they are fundamentally altering the way we live. But Haraway's idea raises an important question: if humans as well as non-humans are participants in social life, then how should environmental anthropologists approach the study of nature and culture in the era of technoscience?

Bruno Latour sought to answer this question by describing how hybrids—objects that simultaneously occupy the realms of nature, culture, and what Latour calls "discourse," or the communication about those things—are constantly reproduced and then deconstructed through the twin processes of purification and hybridization (1991, 10-11). In Latour's language, a hybrid is akin to a cyborg. Latour critiqued social scientists of science for focusing exclusively on the politics and representations within scientific structures. Latour argued that this intellectual approach has reified what he calls the "crisis of modernity," (ibid, 3), the breakdown of distinct categories of nature and culture. He proposed an attunement to assemblages which he calls networks: within the network, each individual object or organism is an agentic actor. Latour's actor-network theory presents a vision of sociality that, instead of viewing society as a material quality of culture, envisions it as an emergent property of the interrelationships of things in the world (Latour 2005, 1-2).

The suggestion put forth that nature emerges from the interactions between objects in space challenges classical thought about nature in a way that suggests a new paradigm altogether. In other words, nature and culture are not separate, but rather one and the same.

More-than-human approaches tell us something about how nature and culture emerge alongside one another, as well as how we come to perceive them as separated. More-than-human approaches are, broadly speaking, a continuation of developments that began in the new ecologies, particularly political ecology. They are fiercely concerned with the issue of representation in anthropology itself, arguing that it is ethnocentric not to consider cosmologies that ascribe agency to nonhumans. More-than-human approaches are at once concerned with how relationships between actors produce phenomena such as identities, subjectivities, practices, and structures. However, the act of becoming in an assemblage is about practice, or what Tsing (2017) calls ontics, as opposed to ontology—doing opposed to knowing. As Strathern (1991, 51-53) pointed out, "A world obsessed with ones and with the multiplication and division of ones creates problems for the conceptualization of relationships." In other words, understanding how networks operate mandates a rejection of the individualist paradigm. This includes both the assumption that nature is a resource to use as well as the one that nature lives merely in our heads. Strathern and Tsing (2012) instead challenge us to observe what they call partial connections. Observing partial connections necessitates comparison, which mandates an ethnographer consider resemblances rather than relations. Becoming is an act that occurs across difference, making it easily obscured. To study an assemblage means to uncover unseen connections in order to see wholes.

More-than-human ethnographies frequently draw on the concept of the Anthropocene—a recently proposed geological epoch defined by a transition to human activities as the dominant Earth-altering force (Waters et al. 2016). Proclamations of the Anthropocene have been alternately critiqued and probed by anthropologists who view it both as a useful and problematic conceptual tool. Donna Haraway (2016, 44-47) contends that the Anthropocene implicates

human triumph over nature and further obscures the kinds of connections to which Strathern has challenged us to attune ourselves. The global emergence of an environmental consciousness that accompanies the Anthropocene has led Anna Tsing to declare that "[h]uman nature is an interspecies relationship" (2012, 141). More-than-human approaches in anthropology differ from the humanistic tradition in that they consider humanity to come into being relative to multispecies assemblages (Kirksey & Helmreich 2010; Ogden et al. 2013, 6). Acts of becomingness are thus central to more-than-human approaches in anthropology.

In many ethnographies of the more-than-human, becoming takes place through encounters that teach us something. There is an intense focus on the way humans learn to interact with other objects in space. Interest in the process of becomingness through relationality can be traced to Donna Haraway's *When Species Meet* (2008), in which she claims that "[t]o be one is always to *become with* many" (4). For Haraway, knowing comes about through encounters; the ideas that emerge through knowing are technologies in their own right (282). This echoes Steward's (1955) view that culture is a response to environment, but differs in three ways. First, where Steward's nature was fixed and limited human life, Haraway's nature is mutable and full of possibility. Second and related, Steward conceived the environment as a unitary whole, while Haraway considers the relations among parts in their own right. Third, Steward's technologies are material objects—knowledge is only considered insofar as it relates to constructing or remaking an object. By contrast, the cultural formations about which Haraway speaks are relationships among actors in space, which implicate a different kind of knowing. While Steward's nature is autopoietic—or comes into being on its own—Haraway's is sympoietic, coming into being through relations among different objects within (Haraway 2016, 33).

The idea that nature and culture emerge together through relationships among objects living and nonliving does not mean that more-than-human anthropologists have abandoned concepts of landscape. On the contrary, descriptions of landscape transformation are integral. However, the difference is that landscapes are not fixed; they are complex assemblages that come into being as a result of relationships Laura Ogden (2011, 27-29) argued that the landscape concept in anthropology has historically treated nature as a stoic background, with symbolic significance held as some sort of essential repository for culture and history. While she acknowledged the contributions of scholars to landscape ethnography, she also contended that there still lacks some sense of how memories come into being through encounters. Alex M. Nading (2013, 2014) proposed describing landscapes as entanglements, which he defined as "the unfolding, often incidental attachments and affinities, antagonisms and animosities that bring people, nonhuman animals, and things into each other's worlds" (2014, 11). The role of more-than-human approaches in landscape ethnography is to reinsert humans into nature while also attuning ourselves to the asymmetrical politics that exist between us and nonhumans.

The assemblage, while political, is something larger than the project of political ecology alone because it considers how nature, power, and society come into being all at once (Bennett 2010, 23-24). Assemblages can be made and reconfigured through social processes—something that Kirksey (2014) and Tsing (2014, 2015) take seriously in their analyses of "blasted landscapes" degraded by capitalism. Blasted landscapes are defined by temporal patchiness created through disturbances (Tsing 2015, 159-162). They are places where the contradictions of capitalism become apparent: the promise of modernity obscures the ruination it leaves in its wake, but through attentiveness to what Tsing calls "unruly edges," we can observe what our cultural conscious has trained us to ignore.

The blasted landscape is an assemblage like any other. Blasted landscapes build on a recent anthropological concern with the built environment as an agent of political ecology (Carse 2012; De Leon 2015; Anand 2017). As Latour highlighted, the process of purification obscures our gaze as Westerners from being able to notice that which lies outside our modern conscription. The assemblage, and thus the blasted landscape, goes unnoticed typically because noticing it requires us to consciously reject many assumptions we are unaware we hold about nature, culture, and capitalism.

A blasted landscape departs from classic theories of landscape in three ways. First, it exemplifies Tsing's interchangeable concepts of patchiness, unruliness, or edginess by interrupting what we assume to be homogeneous landscapes of nature or culture with something in between. Blasted landscapes frequently occur on the edges of urban and rural places, where resources meet populations, and thus blur together elements of what Cronon (1991) calls first and second natures. Second, a blasted landscape shows that modernity comes with consequence, that progress is inseparable from ruination, and thus challenges our linear assumption that capitalism will provide a means out of precarity. Finally, and perhaps most importantly, a blasted landscape does not simply exist in a place: by incorporating forms of contamination in human bodies, the body itself becomes a blasted landscape, and thus a corporeal manifestation of the Anthropocene.

Examining the Chemosocial

Shapiro & Kirksey (2017) classify chemo-ethnography as ethnographic inquiries that focus on the roles of chemical substances in creating new socialities. Chemical ethnographies examine sites of industrial capitalism as haunted specters of ruination that prophecy new futures

for humanity (Tsing et al. 2017). They follow how chemicals enter our bodies through landscapes and political economies, reshape our subjectivities, and alter social structures over time (Romero et al. 2017). Chemo-ethnography, though a new term, is promising for its ability to explain how notions of risk, exposure, and contamination become central parts of the lived experience in a blasted landscape. Chemo-ethnographies describe the entirety of blasted landscapes by accounting for both material and phenomenological conditions that emerge from them.

Studies of chemical toxicity are not new within anthropology, as I have already discussed. Prior studies, especially those concerning environmental injustice or racism, focused on perceptions of risk and toxicity among affected communities. As an assemblage theory, chemo-ethnography represents a unique, specific way of studying chemical toxicity. This is because assemblages propose that nature is something that emerges from interactions between different agents, human and nonhuman alike, whereas previous theories examined nature as a place occupied by humans and other objects. Chemo-ethnography is hence a theory and method for understanding how blasted landscapes are created and give rise to new cultural formations via experiences of risk. This is a specific advantage it has over non-chemo-ethnographic investigations of environmental justice, and an integral one for understanding the relationship between chemical toxicity and the social construction of white identity.

Recently, anthropological scholars have begun to be explicitly concerned with how environmental futures are envisioned and acted upon. An assortment of scholars has begun to theorize about how encounters with industrial ruin inspire alternative visions (e.g. Mathews & Barnes 2016; Jalbert et al. 2017; Tsing et al. 2017; Willow forthcoming). Arjun Appadurai (2013, 194) has encouraged us “to place futurity, rather than pastness, at the heart of our thinking

about culture." This is a limitation of most of the previously mentioned studies of toxicity and environmental justice: scholars have foregrounded pastness, which tells a rich, vibrant story about how understandings of toxicity are filtered through existing logics and worldviews. But how do those encounters inspire reactions? How do they give rise to novel cultural formations? How do people alternatively envision themselves either aligning with or challenging long-standing industrial orders?

These are questions that chemo-ethnography is uniquely positioned to answer. Donna Haraway (2016) has written that more-than-human frameworks are about re-imagining existing social orders to envision new possible questions. She asks, "What happens when human exceptionalism and bounded individualism, those old saws of Western philosophy and political economics, become unthinkable in the best sciences, whether natural or social? Seriously unthinkable: not available to think with" (Haraway 2016, 30). By eliminating two familiar pillars of Western ontology, she challenges anthropologists to consider how human culture might occur in places once obfuscated by our unique positionalities. Haraway presents the case that "being"—an ontological state concerned with human nature as a static condition—is an insufficient lens through which to study culture. Instead, Haraway proposes that we examine *becoming with* as the fundamental state of human nature: humanity is constantly shifting, changing, evolving, and molding in tandem with its surroundings. Haraway is furthermore careful to distinguish autopoiesis (becoming) from sympoiesis (becoming with): humans do not become on our own, but rather with and in response to others. Human nature, in other words, is inherently multispecies.

What does sympoiesis look like when applied to anthropological studies of chemical toxicity? What does it mean to *become with* chemicals? I attempt to address these questions.

Chemo-ethnography implies an anthropological holism that examines how multiple parts of a system connect to one another. Systems thinking has been a prominent trend in ecological anthropology for some time in multiple different iterations (Tsing 2005; Moritz et al. 2016). Given this, it may at first seem unclear what more-than-human anthropology can specifically contribute to our understanding of environmental toxicity. As a more-than-human framework emphasizing relationality, chemo-ethnography makes two specific, unique contributions to ethnography. Rather than rejecting systems thinking or rendering it redundant, chemo-ethnography is actually a fruitful complement to the established paradigm.

First, chemo-ethnography provides an intellectual framework for conceiving the role of chemicals in human sociocultural life. Traditional ecosystems thinking has often focused on so-called "natural ecology," or human involvement in already established systems of subsistence and ecology. As a result, anthropologists have maintained an ironic gaze that obscures the true cultural potential of industrial chemical pollution. Chemicals are simultaneously considered an important antecedent to social activism and obscured from view as purveyors of environmental change. Chemo-ethnography's reorientation of ethnographic epistemology from humans to non-human chemicals foregrounds a class of objects imbued with significant temporal and metaphorical agency over cultural life.

Chemo-ethnography's second unique contribution to environmental anthropology is the designation of specific, clear methodologies to answer transdisciplinary research questions. The suite of classic ethnographic methods is also available to chemo-ethnographers, but we must also turn to soil and water sampling, "ground truthing" (Sadd et al. 2013) archival research, and statistical surveys to fully understand how chemicals and organisms react to create new realities. It is not enough to merely know culture; the chemo-ethnographer must also know about biology,

geology, and chemistry. Anthropologists of environmental justice have been profoundly influential to this point, but they have also been autopoietic. The time has come for sympoietic thinking about chemicals.

Sympoietic thinking about industrial assemblages is necessary if we are to understand the connections available between a body politic informed by a sense of plighted citizenship and the deindustrialization of the American Midwest. Bonvillian (2016) elicits such a link in describing the geographic and economic context of many U.S. counties where President Trump dominated the 2016 election: it is not enough, he contends, to say that Trump's voters are disaffected and angry. They are angry *at and because of* a perceived sense that the global economic order has left them behind. Taken in the specific context of Ashtabula County, Ohio, where much of the manufacturing industries produce chemicals, it becomes clear that one could only understand such a decline by understanding the specific relationships people have with machines, infrastructure, chemicals, and all of the other machinations that make up the assemblage that is the industrial Midwest.

Conclusion: Becoming With Chemicals

Assemblage theory is a natural continuation of the continued breakdown of nature-culture binaries in anthropological theory. The blasted landscape—an assemblage of technologies, infrastructure, and organisms—is a fruitful theoretical construct that allows us to simultaneously think with familiar metaphors as well as expand ontological horizons to imagine new manifestations of culture. In the blasted landscapes of the U.S. Midwest entire chemo-societies have been established as values, lifeways, and ways of knowing became structured around the

chemical synthesis of the surrounding landscape. Such social arrangements can only be understood as chemosocial, springing from ways of living with chemicals.

To date there has been little deployment of the chemosocial among applied anthropologists. While some of the environmental justice scholars discussed in this chapter may call themselves engaged or activist anthropologists (see chapter three for a detailed discussion of this issue) my sense is that most would not call themselves applied anthropologists. Part of the reification of this divide comes from anthropology's storied history of tension among scientists and humanists. The key question implied here is: what is the value of chemo-ethnography to applied anthropologists?

There are four distinct values. First, chemo-ethnography is a holistic way of doing ethnography. Holism is a trademark of anthropological thinking. Chemo-ethnography is a holistic way of doing anthropology: mixed methodologies, cross-disciplinary synthesis, and relationality are fundamental to doing chemo-ethnography, and they all implicate a sympoietic ethnographic mode. Chemo-ethnography does not shy away from trying to make important connections among difficult, obscure actors.

Second, because it is holistic, chemo-ethnography is also inherently interdisciplinary. Anthropologists cannot ignore inconvenient facts: our discipline is often regarded with less prestige than life or physical sciences. To maintain relevance, anthropologists must show that we have unique skills to offer that distinguish us from other academics in the sciences, social sciences or humanities. Rather than specializing, chemo-ethnography demands a broad base of knowledge. Chemo-ethnographers do not necessarily need to know how to compute chemical formulae. But to be a good chemo-ethnographer means just the same thing as being good at any other kind of ethnography: the research must speak the native language, understand the customs,

and gain rapport. Accurate and meaningful analysis also demands the skills and knowledge to navigate large and diverse sources of data. Thus the chemo-ethnographer is uniquely situated to capitalize on recent trends in academia that favor interdisciplinarity because the nature of their research is so by definition.

Third, chemo-ethnography deconstructs dualistic thinking. Life is a chemical process; synthetic chemicals do not simply affect us, they *become with* us. Radioactive isotopes become permanently embedded in our cells, heavy metals concentrate in our lipids, and chlorinated solvents can combine with our bodily fluids. It becomes impossible and illogical to think about humans and nature as bifurcated under such conditions.

Fourth, chemo-ethnography is sympoietic. By examining how humans become with chemicals we produce and spill, we also come to understand how they shape our ways of living. For example, in Ashtabula, entire political and moral economies emerged from chemical industries in the form of unions, the Environmental Protection Agency, political parties, and local citizen watch groups. Christine Walley (2013) has reflected insightfully on how deindustrialization shaped the politics of globalization and populism. My chemo-ethnographic approach takes the argument a step further by examining how specific chemicals structure entire ways of thinking about the world.

There is a clear and urgent need for more chemo-ethnographies. Aside from studying environmental toxicity, Shapiro & Kirksey (2017) also point out that the methodology and theory of chemo-ethnography is useful for a broad range of topics. The approach is uniquely suited for success among environmental justice scholarship, where it can successfully synthesize all of the perspectives and information necessary to understand postindustrial toxicity. It is imperative for anthropologists to situate such chemo-ethnographies in the contemporary sociocultural impacts

they generate. In the case of Midwestern deindustrialization, it is necessary to understand how the promise of better living through chemistry eventually gave way to a graveyard of chemical factories. Chemo-ethnography is both a way of thinking about and practicing an anthropology of the possible—of the hope that exists in blasted landscapes.

Chapter Three: The River of Many Fish

Introduction: Finding a Place in the World

"I'll look for you in old Honolulu, San Francisco, Ashtabula; You're gonna have to leave me now, I know. But I'll see you in the sky above, in the tall grass, in the ones I love. You're gonna make me lonesome when you go."

- Bob Dylan, "You're Gonna Make Me Lonesome When You Go"

Ashtabula County, Ohio is a large, mostly rural county in the state's northeast corner, nestled along the shores of Lake Erie at the foothills of the Appalachian Mountains. Ashtabula County has both general and specific significance for the issues of environmental knowledge and justice. Recently, it has captured the imagination of political and social journalists because its legacy as a postindustrial rural county is seen as a microcosm for national cultural change (Malone 2016; Lurie 2017). In the aftermath of the 2016 Presidential election, there has been an increased focus on such places as harbors of anti-globalization resentment driving a tumultuous political and cultural upheaval.

To anthropologize Ashtabula County is a task of understanding why this sort of generalization is alluring. According to Anna Tsing (2005, 88-90) generalization from local particularities to universalities depend on the fulfillment of axioms of unity and collaboration. In other words, individual cases must simultaneously be alike enough to facilitate understanding

across themselves and unique enough to stand alone as an interesting case themselves. These axioms of unity and collaboration are the product of friction (Tsing 2005). Historian Jon K. Lauck (2013, 6) points to this same idea with respect to the U.S. Midwest by observing that the region's status as a "microcosm of the national macrocosm" has ironically yielded scarce scholarly attention to the history and culture of the Midwest, including Ohio, as particular places. Instead, their histories are obscured by a collective desire to generalize about American progress.

But what happens when such narratives no longer hold true—or what if they never did? I take Tsing's (2005) model of generalization as my approach to framing this question. In this chapter I outline the interface between local and global flows of ecology, people, capital, and materials to explain how Ashtabula County is a microcosm for emerging post-industrial populism across the United States and the world. In so doing I focus on the importance of U.S. manufacturing industry at all stages—extraction, transportation, production, distribution, and waste—as simultaneously being facilitated by and transforming Ohio's geologic and geographic formations. I argue that the legacy of U.S. manufacturing produces an environmental injustice frame that focuses on the ability of working-class whites to abide survival in a neoliberal economy.

This chapter constructs an environmental history of Ashtabula County, Ohio that explains how rural communities are assemblages of local and global environmental systems. I focus on the development of Ashtabula County as a resource juncture for urban networks across the Northeast and Midwest. To develop a more-than-human environmental history of place, I trace the geologic history of Ashtabula County and the more-than-human relationships that made its settlement and formation possible. In later parts of the chapter, I draw on ethnographic data to describe the history of Ashtabula's last 100 years. Outlining a more-than-human history of place

is essential to understanding how Ashtabula's recent economic cataclysms are millions of years in the making, shaped by the opportunities and limitations provided by its landscape.

Ashtabula County Geology and Climate

In his history of Mediterranean mercantilism, Fernand Braudel (1949) pointed to the importance of geologic timescales, or *longue durée,* in framing the context for human economic activity. Adopting this perspective, it is impossible not to view Ashtabula County's unique manufacturing history as a product of its geographic and geologic qualities. Most of what is now known as Ohio's natural landscape dates to the Permian period, about 289-251 million years ago. The two most significant processes were orogeny, or the formation of mountains, and glaciation. These processes produced the Allegheny Mountains and Lake Erie watershed, respectively. While the Allegheny Mountains did not form in what is present-day Ohio, the geologic process that formed them, called the "Allegheny Uplift," created the Appalachian plateaus that define Ashtabula County's topography (Kern & Wilson 2014, 7). The Allegheny Uplift was also responsible for facilitating the development of many of the natural resources on which Ohio's modern industries depend, including such raw materials as limestone, coal, natural gas, and sandstone (ibid, 14-18).

Glaciation—the expansion of glacial ice sheets over land mass—was a process driven by climatological change that had its own profound impacts on shaping Ohio topography. The Laurentide ice sheet, an arctic assemblage of glaciers to the north of Ohio, underwent a series of expansions and contractions that lasted from about 300,000 up until 14,000 years ago (ibid, 8). The most obvious change that resulted from this period of glaciation was the formation of the Great Lakes and their respective tributaries. Glaciation also left salt deposits near the Lake Plains

of northern Ashtabula County and deposited nutrients that fertilized soil. Glacial expansion forced indigenous occupants of the region to migrate southward (ibid, 22-24). Expansion and contraction of glaciers was a force of constant destruction for forests. As a result, forest growths near the Great Lakes have only existed about as long as human habitation has been present. The second-growth forests of the Great Lakes region exhibit features indicating significant human alteration (Langston 2017, 2-7; Cronon 1991, 7). The forests are a multispecies assemblage.

Glaciation produced a dynamic and diverse landscape in northeast Ohio, with uneven valleys and a randomized matrix of drainage routes that in turn constituted of a variety of Earth materials. The slow, erratic glacial retreat produced an important geologic divide between northern and southern Ashtabula County. The north part is the Lake Plain, a stretch of mostly flat, lower-lying land near the shores of Lake Erie. The southern, majority portion of the county lies on the Allegheny Plateau. Figure 3.1 below shows a map of Ohio's physiogeographic regions.

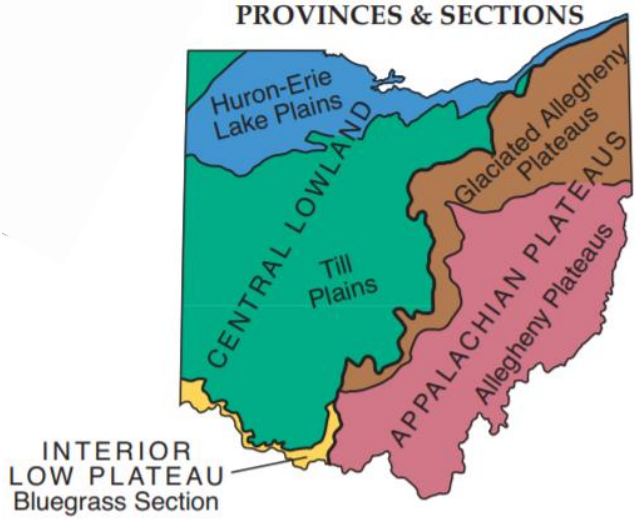


Figure 3.1: Map of Ohio's physiogeographic regions. (ODNR 1998)

The largest carvings glaciation left behind eventually came to be Ashtabula County's two major rivers: the Grand River and the Ashtabula River. A variety of other creeks, brooks, and tributaries also formed, including Fields Brook. Most of the smaller waterways fed into the two large rivers, but not all did—a testament to the complex glacial history. The uneven geologic formations make predicting water drainage difficult, and many of the drainageways along the Lake Plain are inefficient (USDA 2007). The resulting groundwater formations were prone to contamination, particularly by sulfuric acid, presenting Ashtabula County with unique groundwater sourcing challenges. The labyrinthine nature of water drainage would later prove significant with respect to waterway contamination. The resulting topography and fertile soils left Ashtabula County as the northeasternmost part of an agricultural belt that cuts diagonally across the state. Limestone and shale constitute the main bedrock throughout the county. To the north along the lake plain, soils are mostly coarse and loamy, while the majority of the county located along the plateau has finer soil with more clay present (USDA 2007). The average temperature in northern Ashtabula County is 27.2 degrees Fahrenheit in the winter and 69.1 degrees Fahrenheit in the summer. Higher humidity along the lake plain keeps temperatures slightly higher than southern portions of the county (USDA 2007).

Ashtabula's physiogeography is significant for two reasons. First, the industrial settlements to come were a strategic decision to locate at the juncture of several important natural resources, especially coal, iron, nutrient-rich soil, and freshwater. Second, the contrast in soil morphology and groundwater drainage along the lake plain would later trap chemical pollutants in a subsurface labyrinth. The stated reasons exemplify the entanglements of opportunities and limitations the landscape offered its inhabitants.

Ohio and the Colonial Frontier

The earliest known inhabitants of Ashtabula County were prehistoric mound builders (Williams 1878). Later, the Erie Tribe laid claim to most of the land south of Lake Erie throughout the fifteenth and sixteenth centuries. The Erie were an oral society who did not keep written records, meaning much of what is known comes from bioarchaeology or second-hand oral histories of indigenous groups with whom the Erie came into contact (Clark et al. 2019). The Iroquois Nation later decimated the Erie during a territorial conflict in 1658, leaving the Iroquois as stewards of the Ashtabula landscape through the early years of French colonization (Williams 1878).

A period of dramatic change occurred in Ohio with the onset of European colonialism. Imperial tensions between Great Britain and France led the Anglo-French-Indian Wars, which reconfigured North American geopolitics. The 1744 Treaty of Lancaster, negotiated at the end of the War between the British and Iroquois, was used to justify an aggressive land grab that left Great Britain in possession of the Ohio Valley territory (ibid, 62). Concurrently, colonial expansion to the east pushed the Lenape people out of the Delaware territory and into the region now known as Ashtabula County. Upon encountering the river that meets Lake Erie, they noted the abundance of fish available and named it Ashtabula, which translates to “river of many fish” or “always enough fish to go around” (Schutt 2007). Lenape migration inevitably trapped the group between competing groups of colonists, provoking confrontation. This period of increased conflict between colonists and indigenous Americans marked the end of the so-called “Middle Ground” era of relatively harmonious native-colonial relations in the Ohio territory (White 1991).

Following the American Revolution, Great Britain ceded most of the land now known as the American Midwest to the newly formed United States government in the 1783 Treaty of Paris. At this time there were a number of competing land grants for Ohio among the states of New York, Virginia, and Connecticut; the newly formed federal government resolved the dispute over western territories by granting portions of the Ohio territory to Virginia and Connecticut, respectively (Kern & Wilson 2014, 101). Despite emerging victorious from the American Revolution, the United States had consequently incurred a large national debt. Meanwhile, ongoing conflicts with Iroquois in the Ohio territory prompted fear among the young government with the potential loss of this newly acquired territory to an alliance of French, Spanish, and indigenous people.

In response to this threat, Congress passed the 1785 Land Ordinance that laid out how much of the United States would be developed. Underpinning passage of the legislation were the twin beliefs that Midwestern land could be developed as a buffer to improve national security, and that power could be projected by exercising Manifest Destiny across the landscape. The Ordinance had several important historical consequences for the Ohio territory. Fully one-seventh of the land in Ohio was set aside and reserved for veterans of the American Revolution. While some took advantage of this opportunity to move and begin their own farmstead, many instead sold the property they had acquired to wealthy farmers in New England, who were willing to pay for more spacious land outside of the increasingly population dense northeast. Other provisions of the Ordinance set aside lands for public schools and established the modern-day county system. The fundamental grid unit of organizing metropolitan regions stems from the Land Ordinance and is still visible today on the landscape (ibid, 102-105).

Congress later passed the Northwest Ordinance of 1787. This law accomplished three important tasks that the Land Ordinance of 1785 had left unfulfilled. It outlined the process by which local governments could be formed and their powers thereafter. It also detailed the survey procedures for dividing up territorial land. Finally, it created the criteria by which a developed territory could eventually be admitted to statehood (ibid: 105-106; U.S. Congress 1787). Critically, the Northwest Ordinance also forbade the establishment of slavery in the new territories. This was of considerable consequence to veteran farmers from states such as Virginia who could not bring their slaves with them. Because of this, many chose to continue the tradition of selling the land to wealthy New England farmers. A result was that relatively few black people migrated to Ohio during the frontier period—a fact that has an obvious legacy today in Ohio's above-average white population. Meanwhile, early surveys proceeded slowly and had many associated difficulties due to the swamps and hilly forests that spanned the territory.

To raise money for the creation of a public education system, Connecticut sold its Western Reserve territory in Ohio to the Connecticut Land Company in 1795. The following year, while travelling westward to survey the newly purchased land, Moses Cleaveland passed through what is now Ashtabula County. One of his travel companions, James Kingsbury, and his family settled in the territory, becoming the first colonists to occupy what is modern-day Ashtabula County (Ohio History Central 2020). Ashtabula County was the first county carved from the former Western Reserve in 1807. Like much of the rest of Ohio, in its early days prospectors divided up and sold Ashtabula county for agricultural development. Frontier-era Ashtabula County was also a site for several stops along the Underground Railroad which helped southern slaves escape to freedom; one such site is the popular Hubbard House historical landmark (Ashtabula County Historical Society 2020a).

I return here to my earlier discussion of Anna Tsing's axioms of generalizability. It is possible to view Ohio as a model for colonial human-environment interface. Agricultural development in the U.S. Midwest drove rapid land use change throughout the eighteenth and nineteenth centuries. Today, agricultural land comprises fully twenty-three percent of the Earth's continental surface (Smil 2012, 165). This is a process that began in earnest in the United States with the Land Use Ordinance of 1785, and has a pattern of general replicability around the globe (ibid, 165-166). The agricultural partitioning of the Ohio territory and subsequent environmental transformations by way of deforestation and wetland drainage are representative of global environmental change at the time they were occurring. This was the beginning of an Anthropocene Ohio.

There are also axioms of collaboration. This is evident in Ohio's unique position at the juncture of Lake Erie and the Appalachian Mountains. Geography afforded Ohio a valuable place between major resource routes, which I explore in the following section. It is also evident in the sociopolitical circumstances of the time: the conflicts between colonists, imperial powers, and indigenous people were the main social force driving Ohio's development. Ohio history effectively demonstrates its ability to satisfy axioms of unity and collaboration in order to be an effective model for industrial-environmental history around the globe. The next section describes Ohio's transition from frontier to part of the global capitalist system of extraction, urbanization, and environmental degradation.

The Industrialization of the Midwest, Part I: Ports, Railroads, and Farms

The story of how Ashtabula County, Ohio became a site of environmental injustice is an environmental history inextricably entangled with the Appalachian Mountains, the Great Lakes,

and the Great Plains. In *Nature's Metropolis: Chicago and the Great West* (1991) William Cronon traced the historical construction of Chicago, Illinois as an imagined site of human separation from nature. In so doing, Cronon reflected on his childhood in rural New England and Wisconsin, and interrogated his own former belief in the so-called "countryside" as a site of "nature" and of the "city" as being something more-than nature. Cronon wrote:

> "The journey that carried so many travelers into the city also carried them out again, and in that exchange of things urban for things rural lies a deeper truth about the country and the city. The two can exist only in each other's presence. Their isolation is an illusion, for the world of civilized humanity is very nearly created in the continuing moment of their encounter. They need each other, just as they need the larger natural world which sustains them both." (18)

By identifying the metabolic relationship between urban cores and rural peripheries, Cronon challenged a deeply embedded cultural imaginary which holds that urban and rural places, particularly in the United States, are separate. Cronon went on to argue that concentration on the city as a symbol of humanity's conquest over nature obscures the factory and field laborers in the countryside who continue to be an integral part of the urban economy (ibid, 18-19). To understand urbanization, we must pay attention to the networks of dependency that exist between cities and their peripheries.

Early Midwestern settlement relied on the region's fertile soils to produce food. As the population of such settlements grew, more energy was needed to transport more resources at a faster rate. The major resource driving this metabolic relationship between city and countryside was coal. Coal was necessary fuel for the urban industrial apparatus. It improved standards of living for city dwellers by giving them access to a reliable source of energy. Coal made it

possible for other resources to be transported by land, river, and lake. Continental plate shifts in eastern North America during the Allegheny Uplift produced the Appalachian Mountains, trapping forests underground to become coal. The eventual discovery of this coal in the mountains was fortuitous, but making it accessible to relevant populations posed two problems. First was the problem of labor. Early settlements in coal country did not have populations large enough to sustain the workforce needed to extract coal. There was also the problem of transportation: coal country was geographically hundreds of miles from burgeoning urban networks that needed coal the most. The production of coal country thus depended on securing a system of infrastructure and labor that allowed coal to be affordably extracted and transported. The mining labor force derived from 19th and 20th century European immigrants and former southern slaves who lived in work camps owned and administered by the coal companies (Scott 2010, 139).

Another significant resource in this growing urban apparatus was timber. Between 1870 and 1930, deforestation in the Great Lakes region proceeded at an explosive pace, dramatically transforming the landscape into the barren fields with which many associate the Midwest today (Langston 2017, 22-25). Numerous paper mills sprung up on the shores of the Great Lakes, where water made processing timber to paper and disposing of the waste efficient. Wood extracted from the postglacial period second-growth forests was reincarnated in the form of newly built frontier homes.

Railroad and seafaring technologies were the two most consequential developments of the early industrial era which permitted the development of the metropolitan Midwest. Facilitating the development of these technological apparatuses meant engaging in the process of what Cronon facetiously refers to as “improving… first nature” by making it into “second

nature" (Cronon 1991, 56). Seasonal fluctuations limited transportation at certain times of year, inhibiting the growth of the Midwestern metropolis until the development of the steam engine, which gave way to steam ships and railroad technology. Further environmental transformations took place as this additional network was put into place, removing forests and moving gravel to create routes for shipping food and resources more quickly across the land, and dredging shorelines to make space for ships to sail down rivers and across the Great Lakes.

Earlier, I mentioned that Ashtabula County was initially settled when Moses Cleaveland travelled to the recently purchased Connecticut Western Reserve to conduct a land survey. Cleaveland founded the city of Cleveland, Ohio on the shores of Lake Erie, forty miles west of Ashtabula. Lake Erie, the shallowest of the Great Lakes, retains warmth well compared to other Great Lakes, and so has high ecological productivity (Langston 2017, 21). The Lake's many tributaries provided shipping routes to transport raw materials from small towns to burgeoning metropolises such as Chicago, Cleveland, and Detroit (Cronon 1991, 61). The erection of trading posts along the shores of the Great Lakes represented a jockeying for economic viability in a fast-evolving frontier economy. Many of these towns failed to gain or sustain relevance (ibid, 34). Several such trading posts were erected in Ashtabula County during this era, including the Ashtabula and Conneaut ports.

The Ashtabula port was established in the Western reserve in the early 1800's. The small size and low economic output of the community at that time prevented workers from undertaking difficult and expensive lake modifications to expand the harbor. The result was a self-fulfilling prophecy that stunted Ashtabula's early growth. In 1826 however, Congress appropriated funding to remove 13,000 tons of sediment and stone from the harbor, greatly expanding its ability to accept more and larger ships (Feather 2017, 8).

Not all raw materials extracted from this region could be used immediately. Many had to be processed and converted to be useful. Iron ore extracted from mines around Lake Superior needed to be smelted using coal to produce steel for manufacturing. Places like Ashtabula County, which were located midway along the sources of extraction, were ideal points of synthesis to reduce the distance any one material needed to travel. Because harbors and railways already existed as networks for facilitating agricultural transactions, the Midwestern manufacturing sector quickly developed into a global economic powerhouse.

As steelmaking factories cropped up in Youngstown and Pittsburgh, the Ashtabula Harbor became a prominent receiving port for iron ore mined from the Lake Superior region (Langston 2017, 79; Feather 2017, 35-38). Iron ore was received here and transported by railroad south to the larger cities, where geographic accessibility to coke made steel production efficient. At the same time, coal, food, and textiles flowed out of the harbor and to other regions in the Great Lakes. The Ashtabula Harbor was a critical part of the Midwestern urban assemblage due to its central location for processing natural resources (Kern & Wilson 2014, 283-287).

Figure 3.2: U.S. map showing the location of Ashtabula, Ohio at the juncture of Appalachia, the Great Lakes, and the Great Plains. (Encyclopedia Brittanica 2020b)

The sheer size and diversity of U.S. geography and corresponding natural resources gave its young manufacturing sector an early comparative advantage over other nations. Between 1870 and 1879, U.S. Gross Domestic Product (GDP) grew by 71%, and by 1890 the United States dominated the global market with a global share of 36% of manufactured goods (Smil 2013: 22).

In addition, the modern factory assembly line and labor routine are regarded by manufacturing historians as the principal social innovations that propelled the U.S. to the top spot, and were eventually replicated around the world (ibid, 23). The growth of the U.S. manufacturing sector depended on the process of steelmaking, which alloyed iron and carbon to produce strong, durable, and long-lasting multipurpose material. Steel was important to the development of manufactured goods and infrastructure networks, including the materials used to create the very railways and shipyards that transported it (Smil 2013, 29-38). The advent of modern electrical networks facilitated further mechanization of factories and drove further gains in productive efficiency (ibid, 48-54). Steel and coal are thus interdependent on one another for their very existence as components of the modern world.

The Industrialization of the Midwest, Part II: Chemical Life

Throughout the 1800s the Ashtabula Harbor accepted increasingly massive quantities of iron ore, eventually overtaking and sustaining a lead over Cleveland's port (Feather 2017, 73). As the region's economic significance grew, so too did its population. During this time period three cities were founded in Ashtabula County: Conneaut in 1834, Geneva in 1866, and Ashtabula in 1892 (Ashtabula County Historical Society 2020b). The increased receiving load

led engineers to again expand the harbor's size in the later part of the century. Among the major issues addressed at that time was a persistently forming sandbar at the mouth of the Ashtabula River. Removing the sandbar formation periodically was expensive, time consuming, and dangerous, and presented a major environmental challenge for early industrialists. Floods also plagued the young harbor due to its insufficient water modifications (Feather 2017, 223-225). Congressional funding again made necessary environmental modifications possible (ibid, 89-95).

Northeast Ohio, including Ashtabula County, industrialized rapidly in the early part of the twentieth century, becoming a global manufacturing hub (Kern & Wilson 2014, 282). The first half of the century was a period of boom and bust for Northeast Ohio as postwar advances led inevitably to stock market crashes and the Great Depression. The beginning of the decline of coal also occurred during this time, forcing many laborers in the coal fields of Appalachia to seek new work. Many migrated north to work in the factories (Feather 1998, 16). Industry flourished in Ashtabula: manufacturers produced everything from automobile parts to infrastructure and construction equipment to household chemicals.

Ashtabula residents who were alive during this time describe an era of great transition. According to one elderly informant, the 1930s in Ashtabula were a time of transition from an agricultural to an industrial economy:

> "I grew up on a farm in Kingsville, like a lot of people I knew. There were no traffic lights; everything was a dirt road. We didn't have indoor plumbing."
>
> - Interview with JH, Ashtabula OH, Dec. 20 2018

Prior to World War II, and especially during the Great Depression, Ashtabula was still a fledgling industrial town. Its port was mighty, but it had not reached the prominence of larger cities like Cleveland, Youngstown, or Pittsburgh, who were historically seen as the muscle behind the U.S.'s steel manufacturing regime. Ashtabula was nonetheless a thriving place with a strong economy and good opportunities for people. Early 20th century Ashtabula was still largely agricultural, although its industrial base was beginning to grow. The waterways, especially Fields Brook, were important sites for childhood play, fishing, and other community activities. Many elderly residents with whom I spoke talked about a golf course that existed along the banks of Fields Brook during this time period.

After the start of World War II, the United States entered its largest manufacturing boom cycle in history. The manufacturing workforce grew exponentially, especially in places like Ashtabula. Later studies have indicated that early industrial psychologists found that communities like Ashtabula—where there were large settlements of Catholic migrants from an array of European countries—were an ideal location for manufacturing facilities. This was due to the fact that such populations were seen as more conservative, less politically or economically able to resist, and would be fragmented across a small community by linguistic and cultural differences (Powell 1984). In the 1940s, various chemical industries sited in Ashtabula County, mostly locating themselves in an industrial complex owned by Du Pont Chemical at the juncture of State Road and Middle Road along the Township/City border. The complex included such well-known companies as Sherwin-Williams and Union Carbide.

Jobs were plentiful in Ashtabula. One elderly man who grew up in the 1940s described the industrial boom he recalled from his childhood:

> "In the 40s [Ashtabula] was such a great place to work. There was so much work that everybody could work 16 hours every day, and many people did. A lot of people came to town from West Virginia, in the coal mines, and they worked in the factories. During the war effort, men and women were working two jobs, and just think of what we did. We built so many tanks and so many airplanes and things--that's why we won the war.
>
> - Interview with RK, Ashtabula OH, Dec. 17 2018

Residents view industry as a net positive for Ashtabula's economy. However, it was not without its detractors. Farmers who had established family steads near the industrial complex, especially along Middle Road near the banks of Fields Brook, complained that the development of industry hurt their property values. Some expressed concerns that contamination would affect their crops. Throughout the mid-twentieth century there were land deals in which companies purchased property from landowners. Local power brokers made deals to build new facilities. Ashtabula's famed golf course eventually befell this fate. Eventually, local legislators passed zoning ordinances that converted many of the neighborhoods sought by industrialists from agricultural or residential zoning to industrial. With seemingly no other choice, many farmers who had long held out on selling their land gave in and settled. One great aunt who lived in this area spoke begrudgingly of the situation:

> "After my husband's parents died, his older sister was in charge of the estate, and for a very long time she refused to sell the land, believing that she was not being offered what it was worth. Eventually with the new zoning ordinance and

> the contamination of the Brook, I can recall she went to several public meetings and acted very upset about it. In the end, she eventually had to sell it, but it was for far less than we believed it should have been worth."
>
> - Telephone Interview with GA, Dec 5 2018

Hearing my great aunt describe how this region had swiftly transitioned from agricultural and residential to industrial struck a visceral chord within me: my own childhood home was located in this area. Growing up, I recall the prevalent grape vines and fruit trees of all kinds—apple, cherry, apricot, pear—all around our property and our neighbor's. I had known the history of our land from my mother's telling: our house had once been a farmhouse, while the orchard owners lived next door. Somewhere in the lineage the orchard owners closed their homestead and had the farmhouse converted for sale, splitting the property into two parcels. As I conducted my interviews and pored over archives, I began to finally understand why that had all happened. The orchard owners probably saw the writing on the wall when they sold the home to my parents.

Besides some of the more widely known industries, there were a variety of other facilities that operated around Fields Brook. The brook's proximity to the Ashtabula River and Lake Erie made it an ideal source for chemical processes, as well as an easy place to dump residue and wastes. As late as the 1960s scientific consensus held that the Great Lakes' vast size imbued them with a "purifying power," meaning that any pollution issues were localized and could be attributed to the poor management techniques of individual coastal communities (McGucken 2000, 40; Langston 2017, 31-32). A variety of chemical industries produced a cocktail of chemicals. Acme Scrap Metal, a waste metal disposal and recycling facility, accepted metal

wastes from sites across the county. The railroad company Conrail was the leading railroad industry in Ashtabula, with lines throughout the entire county, especially concentrated along State Road industrial area.

One of the most consequential manufactured goods that came to be associated with the U.S. Midwest, especially in Ohio, is the automobile. A symbol of technological achievement and personal status, automobiles radically transformed environmental flows across Midwestern geography by allowing individuals to move around on their own accord. Instead of ships and trains carrying large sums of people and products, automobiles allowed the task to be accomplished on an individual basis. Their compactness and the ability to construct roads in areas that would not be conducive to rail or waterway travel expanded the scope of possible transportation routes across the Midwest. The rise of the automobile facilitated further land-use cover change by generating the process of urban sprawl: with personal transportation now available, people could live outside of the densely populated and increasingly polluted urban cores (Wells 2012; Vig & Kraft 2013). With car culture came an increased dependence on foreign oil, which in turn led to national security complications. The twin imperatives of growth and defense spurred the Federal Aid Highway Act of 1956. The construction of an interstate highway system brought yet another valuable transportation resource to Ashtabula County in the form of I-90. Eventually, to facilitate the national defense and economically desirable transportation of manufactured chemicals, federal aid money was awarded to Ohio for the construction of OH-11, a state highway that runs from the northern part of Ashtabula, near Lake Erie, to the West Virginia border.

The construction of OH-11 was the first major intentional modification to Fields Brook. Prior to its construction, Fields Brook ran across a wide open field—the namesake for the

waterway itself, as far as I can tell. During construction, ODOT paved over parts of the Brook and mitigated underground to permit continued waterflow while allowing surface transportation over top. Figure 3.3 below shows an aerial image of Ashtabula before OH-11, with the wide field between settlements being the general landscape of Fields Brook downstream from the chemical facilities. At the bottom is the Ashtabula River, blackened by pollution. To the left near the bottom one can see the docks, colored red by the iron ore present. In the north are the chemical factories, with visible smoke above. The open field of land on the far right, near the center-top, is the present-day location of OH-11. Fields Brook runs through there.

Throughout the 1950s and 1960s, Ashtabula's chemical industry made itself increasingly known. Residents who were alive during this time spoke about the chemical clouds that would blow downwind from west to east, bringing odors and scratchy throats with them into more rural parts of the Township. As Ashtabula grew and people produced and consumed more, pollution became widespread and increasingly visible. As an example of the aforementioned advent of car

Figure 3.3: Aerial photograph of Ashtabula, circa 1960. Photographer unknown.

culture, several older informants told me about Sunday car washes, in which residents of Ashtabula would all drive their cars down to the Smolen Gulf Bridge and wash their vehicles with buckets of water from the Ashtabula River. Some even insist that they recall people changing oil of their cars there, dumping the used material into the River to be washed away. Visibly blackened by pollution, the Ashtabula River was the most visible sign of contamination to many Ashtabula residents.

Although I was not able to locate photographs of Fields Brook from around this time, I did speak to many people who had walked or driven past it on a near daily basis. Their words paint a vivid image of their sensorial experiences back then:

> "I can certainly remember that there was an odor around Fields Brook… I am not sure I recall the exact nature of the smell, but it was something chemical. And I also remember seeing a foul green fog or smoke or something like that over the water once or twice."
>
> - Telephone Interview with GA, Dec 5 2018

> "I grew up in a different part of town, but I can remember driving over Fields Brook, over by the factories, and smelling an odor like rotten eggs. You always had to hold your breath and roll up the car windows when you went over. There was no life near the banks of the brook. Te trees were devoid of leaves and you never saw any animals nearby. If you did, you knew not to hunt them."
>
> - Interview with JD, Andover OH, Dec 9 2018

> "As a child, I attended Mt. Carmel Catholic School. We used to walk from the school to the church over on Columbus Avenue, over a bridge that went over Fields Brook. It was always bright, vivid colors: turquoise, mustard yellow, milky white! And the odor was so bad you got light-headed—some kids even would pass out it was that bad!"
>
> - Interview with JC, Ashtabula OH, Dec 22 2018

> "The Brook would always smell and be different colors, depending on who had dumped in it that day. If it was red for example, then that meant some kind of dirty solvents. If it was white and had a chlorinated or sulfur smell, that was the old Gulf & Western Plant."
>
> - Interview with AR, Ashtabula OH, Dec 14 2018

> "As kids, we would ride our bikes down to the Brook and skip rocks. We would always try and see who could get the water to turn the most bright or interesting colors by stirring up the sediment with our rocks."
>
> - Interview with BF, Ashtabula OH, Dec 19 2018

The above quotes signify important sensorial experiences, especially sights and smells, that constitute people's memories of Fields Brook. The medical anthropologist Mark Nichter (2008, 163) has posited that attention to the sensorial can "contribute to the study of transformative healing and trajectories of healthcare seeking… in pluralistic healthcare arenas." Here, we can understand sensorial experiences with Fields Brook as shaping individual

perceptions of what constitutes a contaminated environment, and therefore an environmental health risk. Contamination is demarcated by strong, pungent odors and vivid colors not commonly observed in nature. These out-of-the-ordinary experiences were memorable to informants decades after they occurred, signifying the impression Fields Brook contamination left upon them—a phenomenon Deborah Davis Jackson (2011) has referred to as "scents of place."

Ashtabula residents who have been around since this time also remember a community that was economically vibrant, with lots of businesses and things to do. They are nostalgic for a lost time when it seemed like everything was simpler: "Kids today can't have that experience," is a refrain I heard over and over. However even as times were regarded as simpler and better, there was acknowledgment of broader problems lurking beneath the surface: racial and ethnic tensions, the Cold War, and the contamination of Fields Brook and the Ashtabula River were among the most pressing. As Ashtabula entered the 1970s, it began to find itself increasingly at the mercy of broader national and global trends that eventually shaped its fate. The juxtaposition of contamination with prosperity is an important historiographic point of culture to which I will return later.

Conclusion: The Significance of Ashtabula's Early History

Located at the juncture of Appalachia, the Great Lakes, and the Midwest, Ashtabula is a quintessential rust belt American community. Its geography and geology are significant to understanding the development of industry because of the specific resources and topographies available to settler industrialists. Because of its proximity to natural resources, Ashtabula later became a pivotal intersection between ports, railroads, and factories that facilitated the

manufacture and distribution of U.S. steel. Ashtabula was a key part of the United States' manufacturing legacy.

This chapter described the recorded and lay histories of Ashtabula as remembered and written by those who were present. Industry has traditionally been viewed as an important facet of Ashtabula's cultural identity and has thus shaped notions of security and prosperity. Informants frequently longed for these "good old days," in which Ashtabula was perceived as safe, affluent, and enjoyable. As the industries became more chemically dependent, residents fell in line supporting the industries that employed them. Many residents described unpleasant memories of Fields Brook, the Ashtabula River, and Lake Erie only fleetingly or in hindsight. The sensorial experiences of smelling and seeing unusual features in the brook imprinted on the memories of many with whom I spoke.

The following chapter is a continuation of this chapter's discussion of Ashtabula environmental history. While this chapter has examined geographic and economic forces, the next attends to the long-term impacts of new environmental policies meant to curb environmental pollution. The perceived economic impacts, in part, help explain the nostalgic lens through which informants viewed past prosperity.

Chapter Four: Trashtabula

Introduction: Jobs Versus the Environment

"We witches live so long that we constantly accumulate useless land. Just last week I found out I own a driveway in Ashtabula!"

- Aunt Zelda (Beth Broderick), *Sabrina The Teenage Witch*

As Ashtabula manufactured its way into the 20th century, industries had little awareness of or regard for the ultimate repercussions of their activities. In an age of seemingly ever-expanding prosperity, the people of Ashtabula were hardly prepared for the paradigm shifts that took place beginning in the 1970s that would eventually result in a massive reduction in the United States' manufacturing workforce.

The advent of the age of environmentalism spurred a change in perspective that, in turn, altered laws and policies. New regulations and an omnipresent fixation on profit efficiencies spurred many industries to move to other states or countries. In Ashtabula, many remember the dawn of environmentalism bitterly as the start of an age of decline. Since the 1980s, Ashtabula County has lost population, with losses of 2-4% per decade. Most of those who leave are young and well-educated, resulting in an outsize prevalence of elderly, low education attainment people (U.S. Census Bureau 2020).

This chapter completes the story launched in the previous one by tracing Ashtabula's environmental history through the present day. I left off detailing the memories of what

Ashtabula and Fields Brook were like during the heyday of industry. Here, I pick up with a national lens, by examining the trends that launched the U.S. environmental movement. I then turn to ethnographic data on how my informants perceived economic and environmental changes taking place around them in the late 20th and early 21st centuries.

The First Earth Day: National Discourses, Local Impacts

Throughout the latter half of the twentieth century, a new environmental consciousness began to form in regard to the effects chemicals had on bodies, human and nonhuman alike. Rachel Carson's classic book *Silent Spring* (1962) is widely credited for generating a paradigm shift. In *Silent Spring*, Carson documented the harmful effects of the pesticide DDT on animal populations she observed working as a government ecologist. Her publications generated a shift in public opinion in favor of stronger environmental regulations.

Environmental consciousness was slow to reach the Great Lakes region. Ecological changes in Lake Erie were noted slowly, but accelerated eutrophication was observed in the Lake beginning in the 1960s. Changes were initially noted near the Lake floor, where ecological hierarchies of species were reordered as some died off and the composition of oxygen in the water changed (McGucken 2000, 44-46). In 1969, the Cuyahoga River fire in Cleveland attracted national attention to northeast Ohio's profound transformations of nature. A modern Midwestern metropolis, this once shining symbol of human progress was now a burning monument to human ignorance of nature.

All of this led to the birth of the modern environmental movement. The first Earth Day in 1970 marked a new age of environmental consciousness for many United States citizens. However, the early environmental movement tended to focus mostly on experiences of pollution

among primarily middle-class suburban Americans. The early modern environmental movement is often critiqued for its inattention to environmental problems in areas of lower socioeconomic status (Willow 2015). However, several pieces of important legislation did come out of this, including a ban on DDT, the Clean Air & Water Acts, and the creation of the Environmental Protection Agency (Layzer 2012, 32-35).

It is common to think of environmental and labor interests as divergent. Often, environmental regulations are framed by power brokers as burdensome intrusions on industry's innovative faculties (ibid, 174-202; Hochschild 2016, 78-79; Cooley & Casagrande 2017). However, a historical legacy of workplace accidents and exploitative practices led to the development of labor unions, particularly in the industrial Northeast and Midwest of the United States (Zinn 1995, 220-231; Feather 1998, 2017). This exemplifies what Joan Martinez-Alier (2002) has called "the environmentalism of the poor," the fact that for many, economic class and environmental conditions are inextricably linked. Legislation such as the Occupational Safety and Health Act of 1970 and Toxic Substances Control Act of 1976 reflect the environmentalism of the poor by seeking to protect people who are exposed to industrial pollution either by way of their labor or the community in which they live (Wylie 2018, 46). In Ashtabula County, the labor movement laid its roots in the legacy of harbor, railroad, and factory workers in the community. As the County developed its industrial and transportation economies, employers found themselves in short supply of labor (Feather 1998, 16). Daily injuries and deaths in this early industrial hub led to lawsuits, organizations, and demonstrations (Feather 2017, 215-223). The result was a strong culture of labor organization and the exercise of First Amendment rights among the early Ashtabula industrialists.

Many of my informants had themselves worked in factories, on railroads, and at ports where there had been deadly accidents. Hearing how casually they talked about their friends and loved ones being maimed, burned, crushed, disintegrated, drowned, and cut open was chilling and sometimes traumatizing. Many of these conversations took place in groups over breakfast at a diner one cold morning in March 2019. However, because this brutal history was an important part of Ashtabula's cultural identity, I am choosing to present their stories without censorship:

> "Like a lot of young men, after I graduated high school I went to work for the railroad. A young buddy of mine, maybe about a year older, was riding around on the outside of the train cars one day as they went around the station. One of our supervisors warned him against doing that. Well he didn't listen, and all of a sudden he and another train car going opposite directions passed too close… he didn't have time to react. He was crushed and rolled between the cars, and died instantly."
>
> - Interview with TO, Ashtabula OH, March 2 2019

> "When we worked down at the coal docks, they used to use that large chute, you know the one that goes over the River? Well one day they had two guys up their working and something near the bottom ignited. The flames traveled up the chute quickly, and they were trapped. Hours later the fire went out and they could retrieve what was left of the bodies. That was a sad day in town."
>
> - Interview with JO, Ashtabula OH, March 2 2019

> "I don't recall too many bad accidents when I was working at the sodium plant. I do remember one: they were working with a dolly transporting some equipment, and the driver didn't put on the brakes, so the dolly rolled backward and crushed a man. But the big thing you had to look out for was sodium fires. Sodium reacts with water and it catches fire easily."
>
> - Telephone Interview with GA, December 5 2018

> "At Union Carbide, they would pour material into the large molds. An alarm would sound telling you to get off the floor. Once a guy didn't make it off in time. He didn't directly touch the hot molten molds, but the heat they irradiated was enough… his skin was split open by the heat. He didn't make it. And it wasn't fast, either. The poor guy suffered…"
>
> - Interview with RC, Marion GA, March 14 2019

Labor and environmental safety in industry go hand-in-hand: many dangerous environmental practices are, in turn, dangerous to the human health of workers. These anecdotes demonstrate the consequences of the single-minded pursuit of modern expansion, power, and profit many of these companies pursued. Like the previous anecdotes describing Fields Brooks' contaminated state, this set of quotes exemplifies a tendency among informants to remember and emphasize the traumas of industry almost as much as the prosperity it brought.

President Richard Nixon created both the Environmental Protection Agency (EPA) and Occupational Safety and Health Administration (OSHA) in December 1970. The ultimate goal of this paradigm was to find consensus among labor and environmentalists on the issues that were

perceived as most affecting the white working class unions that formed a powerful political bloc. However, environmental issues in many poor communities still went ignored, and the larger issue of illicit dumping remained both widespread and unaddressed. Even after the 1970 Earth Day protests launched modern environmentalism, several additional national events were necessary to fully draw awareness to the toxic effects of industry.

Environmental Justice and Congressional Response

In 1973 the Ward Transformers Company in North Carolina dumped polychlorinated biphenyls (PCBs) along the side of a rural highway. After the egregious act was discovered, the North Carolina government and the company agreed to remove the contaminated soil and place it in a landfill in Warren County, whose population was 75% black, mostly unincorporated, and ranked near the bottom of GDP of all of the state's counties (NRDC 2016). Yet still, environmental justice did not enter mainstream consciousness until the Love Canal case in 1975, in which a mostly working class and predominantly white community discovered they inhabited land built over a toxic and radioactive stew of pollution (Layzer 2012, 56-73).

The most significant achievement of the Love Canal case was the passage of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, which authorized the EPA and U.S. Department of Justice to criminally prosecute industries or individuals who had either knowingly or otherwise improperly stored or disposed of toxic chemical waste. CERCLA created what was known as a National Priorities List (NPL) for potential sites, designated "Superfund Sites." The underlying philosophy of CERCLA was what is known as the "polluter pays principle": even if all responsible parties could not be located or identified, those that played some role in the creation of Superfunds must pay for their cleanup.

The EPA listed sites on the NPL if their contamination index—a risk measure to evaluate potential impacts of toxic waste to human and environmental health—exceeded a threshold of 44/100; Fields Brooks' index was 62. The lawsuits and fines leveraged as part of CERCLA's exercise were put towards the "Superfund" account which would help fund cleanups of sites where the responsible parties could not be located or were unable to finance the cleanup (U.S. Congress 1980, 1986; Layzer 2012; Vig & Kraft 2012; U.S. EPA 2019).

CERCLA's passage in 1980 was a watershed moment in Ashtabula's environmental history. As a rural industrial county, Ashtabula was home to multiple possible candidates for inclusion on the NPL. Five Superfund Sites were eventually listed in Ashtabula County—the most of any non-urban county in Ohio. Although Fields Brook is the most salient and well-known of the sites, it was actually the last one to be declared. Four other sites—Laskin-Poplar Oil Company, Big D Campground, Old Mill, and New Lyme Landfill—were added to the NPL in 1980. The first four Superfund Sites listed in Ashtabula County were simpler cases than Fields Brook: they were small, contained properties with a single responsible party. Each of the five Superfund Sites in Ashtabula is in a distinct community and has a particular historical and cultural significance. While I did not devote my analysis to all five of the sites, it is curious to note the entanglements across the Superfunds. For example, Olin Company, which was responsible for dumping chemical wastes at Big D Campground, was also a responsible party for Fields Brook: the company's main production facility was in Ashtabula near the Brook, but they had disposed of some waste miles down the road into Conneaut Creek at the campground. Likewise, PCBs and other waste materials from the plants surrounding Fields Brook were sold to and disposed of at Laskin-Poplar Company and New Lyme Landfill.

Fields Brook's reckoning finally came in 1986 when Congress passed the Superfund Amendments and Reauthorization Act, strengthening the law and allowing the Department of Justice to pursue collecting damages for Fields Brook. The Superfund declaration of Fields Brook entailed a different politics of manufacturing, water, and energy than those playing out at the other four sites. Because Fields Brook feeds into the Ashtabula River and then into Lake Erie, there is a greater risk of contamination spreading and intruding at Fields Brook. The Great Lakes Water Quality Agreement between the United States and Canada, first passed in 1972, played a major role in Fields Brook's Superfund designation and cleanup: the 1987 Amendment to the Agreement created "Areas of Concern" (AOC) that would need to be addressed. As the Ashtabula River was designated one of the first major AOCs, Fields Brook was deemed an essential part of the cleanup. The cleanup itself was possibilized by this assemblage of laws and policies.

Once Fields Brook was listed on the NPL, a long process of litigation began as the U.S. Department of Justice subpoenaed more than twenty different companies that had operated at the industrial complex over the last several decades. Many of the companies fought against the charges, seeking to minimize the amount of damages they would have to pay for remediation of the Brook and reparations to affected communities. The bulk of the controversy around Fields Brook's Superfund declaration centered on the human health and environmental impacts of Reactive Metals, Incorporated (RMI), which owned and operated a uranium extrusion plant near the Brook. I discuss this in more detail in the next chapter, wherein I treat environmental activism as a chemosociality of radionuclides.

Throughout the late 1980s and early 1990s, the U.S. EPA, in partnership with Ohio's EPA, held a series of public meetings about the Superfund Site. Public meetings were centered

around community involvement and education. Residents were encouraged to attend, learn about the site, voice their opinions, and seek more information. My Great Aunt, who was the senior secretary to the plant manager at RMI, attended many of those meetings and kept records of them for the company:

> GA: "My husband's sister, who owned the farm property along Fields Brook on Middle Road, would attend these meetings and raise a big fuss. She used to say she/we "owned" Fields Brook. Well anyway, she believed that the issues with the crops going bad year after year and the decline in property values were because of the contamination.
>
> RB: "What did she seem to want out of it?"
>
> GA: "Money. Or something to that effect."

This quote showed a common sentiment among many who lived near Fields Brook, that corporations had exploited them and their properties. There was also a sense among these people that they were not being listened to by government, corporations, or even their peers. One cannot help but notice a twinge of dismissiveness in my Great Aunt's recollection.

In her memoir *Mosaic and Memory: My Life Then & Now* (2018, 94) anti-war activist Bea Silverberg recalled attending one meeting about RMI and Fields Brook in 1989:

> "Then we heard that RMI was asking EPA for a permit to store their radioactive waste here in Ashtabula, and disclosed that they had been "holding" their wastes on site during the 80's because the old storage destination of Fernald, in southern Ohio, was full. In my statement at the hearing I said, "The people in the area of

these plants are demanding the facts of this life-threatening contamination be made known, that the pollution be stopped, and that those responsible be made accountable."" (94)

Public and private meetings were held frequently from 1982 to 1989 while litigation and dispute resolution regarding Brook cleanup was ongoing. The U.S. EPA facilitated many of these dispute resolutions, and maintains records of the dispute resolution as well as the results of all environmental analyses in public databases. Previously, photocopies of these records were kept at the Ashtabula County District Library and the Kent State University Library in Ashtabula. This changed in 2013 when President Obama signed Executive Order 13542 ("Open Data"), which mandated the records be converted to digital format and made available online. In total, there are 907 documents, many of which show the once private communications between "potentially responsible parties" (PRPs), U.S. EPA, and the various environmental law and engineering firms hired to represent the PRPs in negotiation and assessment.

While the site was initially identified as a potential Superfund in 1982, it was not placed on the NPL until 1986—four years later. This was mainly due to the sheer complexity of the site: Fields Brook is a six square mile watershed that drains approximately 15% of the total county, including four different communities. EPA officials generally agreed that while agricultural and sewage runoff contributed to Fields Brook, the vast majority of hazardous contamination—especially that which in turn affected the Ashtabula River's status as an AOC under the GLLA—had come from the chemical industries operating near the State-Middle Road industrial complex. Adding another layer of complexity was the fact that multiple facilities had changed ownership over the decades. This set off a long chain of litigation and finger-pointing, in which companies cited by the EPA as PRPs sought to shift some of the cost burden to others. In one early meeting

held in 1982, U.S. EPA and the original PRPs discussed what additional companies might have been responsible. The list included the builders of the plants themselves, previous owners and operators, suppliers, and several industries that the PRPs believed EPA had mistakenly not included. The list of original PRPs included the following 19 companies:

- Detrex Chemical Industries
- Union Carbide Corporation
- Reserve Environmental Services
- ACME Scrap Iron & Metal
- LCP Chemicals
- Brenkus Excavating
- Plastic Colors
- Olin Chemical Company
- Elkem Metals
- International Minerals & Chemical Corporation
- Archer Daniels Midland
- Consolidated Rail Corporation (CONRAIL)
- Cleveland Electric Illuminating
- Gulf & Western
- Sobin Chemicals
- Occidental Chemical Corporation
- Diamond Shamrock
- Reactive Metals, Inc.
- Gencorp

Sherwin Williams, which originally owned one of the facilities operated by Gulf & Western, was not cited as a PRP. ACME, which made an effort to shift cost burden to some of the suppliers of its wastes, ended up bearing most of the responsibility for its own contamination, with EPA arguing that the company was responsible for how wastes were handled once they had purchased them from producers. Notably, the Occidental Chemical Corporation was formerly the Hooker Chemical Company—the very same company responsible for the infamous Love Canal that set the Superfund program in motion.

Finally, the documents list the contaminants detected in Fields Brook's water, sediment, and in biological specimens. EPA scientists found hundreds of different chemical contaminants to be above the acceptable thresholds for organismal health. Many such contaminants exist in various classes or categories. For the sake of simplicity and organization, I list the chemicals below according to broader class (e.g. rather than specifying the types of polychlorinated biphenyls, or PCBs, they are listed as a category):

- (Poly)vinyl Chlorides: also known as chloroethenes or chlorinated solvents, these raw materials and intermediary products are used in the production of PVC piping
- Metals and metalloids: the list of elemental contaminants detected at Fields Brook include mercury, cadmium, antimony, arsenic, beryllium, copper, chromium, lead, nickel, selenium, silver, thallium, and zinc
- Benzenes, including chlorobenzenes: volatile hydrocarbons; the chlorinated molecules are a powerful solvent used in manufacturing processes
- Anthracene: a chemical by-product of coal tar produced by burning coal
- Nitrates and nitrites

- Polychlorinated biphenyls (PCBs): an oily, thermally conductive compound with more than a thousand known variants, each with distinct human health outcomes
- Radionuclides: the list of radionuclides detected at harmful levels included uranium isotopes 234, 235, and 238; radium isotopes 226 and 228; and thorium

Many of the contaminants described above had reacted with one another either during manufacturing processes or after their improper disposal, resulting in a variety of combinations of the chemicals mentioned above. Chemical contaminants of Fields Brook had a variety of everyday uses, including paint thinners, insect repellants, insecticides, fertilizers, household cleaners, and automobile parts (U.S. EPA 1986).

"First it all went bad…": Deindustrialization and the 1980s Recession

Beginning in the 1970s another profound economic transformation took hold that left the once proud industrial Midwest with its contemporary Rust Belt nomenclature. A combination of a renewed faith in laissez-faire market principles and increased economic globalization produced a rapid deindustrialization of the United States workforce. Christine Walley (2014, 3) defined deindustrialization according to the proportion of American workers employed therein: "[I]n 1960, one-third of all laborers in the United States outside agriculture had jobs in manufacturing, while in 2010, only a little over one-eighth had". In his theory of globalization Arjun Appadurai (1990, 297-298) referred to the fact that information, materials, and capital can move at ever-increasing speeds around the globe, producing once unimaginable realities. The principles of global flows as introduced by Appadurai govern the process by which U.S. deindustrialization took place: even as the U.S. economy expanded, manufacturing jobs declined rapidly in the second half of the twentieth century simultaneously with a rapid decrease in the average

consumer's personal wealth and purchasing power (Kern & Wilson 2014, 459-461; Jefferson 2015). As technological advances produced a globalized society with the United States at the hegemonic center, the increasingly rapid dispersion of capital weakened the very foundation of that hegemony. U.S. manufacturing total employment peaked in 1979, with 20 million jobs. The economic recession of the 1980s caused this figure to decline to about 16 million by mid-decade, and it eventually recovered slightly to about 18 million by the end of the decade, where it remained until the new millennium (Smil 2013, 133-136).

There are multiple structural causes of deindustrialization. The decline occurred concurrently with or after much of the previously discussed environmental legislation. The proliferation of global trade through agreements such as the North American Free Trade Agreement made it possible for producers seeking to avoid expensive environmental regulations to move their operation overseas, where desperation for development could be exploited more readily (Vig & Kraft 2013). The changes that began in the 1980s were greatly exacerbated by the 2008 Great Recession, which alone accounted for a loss of nearly one-fifth of the U.S. manufacturing workforce (Smil 2013, 133-136).

Sherry Ortner (2016) defined this dawning era called "neoliberalism" in terms of three primary cultural-economic characteristics: free markets, free trade, and individual responsibility. David Harvey (1989) wrote that neoliberal globalization compressed space and time through the development of increasingly efficient technologies. But globalization rendered Ashtabula County's locational qualities less meaningful. As a former industrial powerhouse for the Midwest, northeast Ohio was particularly affected by neoliberalism. The job losses hit working class men with a high school education the hardest; economic decline led to population decline, which in turn eroded social infrastructure. The decline of once proud industrial regions drives a

sense of unfairness and resentment among rural Americans who occupy these zones. While the total number of U.S. manufacturing jobs did not significantly decline during this time, many did leave places like Ashtabula and other once thriving Midwestern towns and cities and head south, where regulations were believed to promote growth. I spoke with a variety of people who lived in Ashtabula during this time who described the economic transition taking place:

> "In the 80s you started to see a lot more problems as the factories left. After my marriage ended I moved from Plymouth Township to the Harbor, in Ashtabula City. Women started to work more, and I was one of them. I worked for the water company in town as an inspector, then later in construction. I didn't think I could do it—but I did."
>
> - Interview with JH, Ashtabula OH, Dec. 20 2018

> "In the 80s you started to see a lot of the factories leave. The good jobs were going away. I myself was laid off from my job as a health and safety manager from the First Energy coal power plant in the early 90's. I ended up taking a big pay cut when I went to work somewhere else."
>
> - Interview with LL, Ashtabula OH, Jun 2 2019

> "Back in the 70s and 80s, things started to go downhill. All of the factories packed up and left for Alabama or China or wherever, and they left quite a mess behind. We used to have so many people working on the railroads and the coal

> docks. Well, then in the late 90s they closed most of the railroads, and then the coal went out in the 2000s. There ain't nothing left."
>
> - Interview with JA, Rock Hill SC, Mar 1 2019

The above quotes all came from elderly informants, one woman and two men. Because many companies claimed that burdensome union demands and federal regulations were the cause for their movement, they were able to frame this transition as a rational choice. Some who stayed behind thereby blamed government for imposing too many regulations. One informant said:

> "It was good that they cleaned up the mess all those companies made with the River and the Brook, but they took it too far. They made the regulations so stinkin' strict that it became impossible to do business anymore."
>
> - Interview with RK, Ashtabula OH, Dec. 17 2018

This is an example of what Arlie Hochschild has called the "deep story" or "feels-as-if" story by which people come to make sense of complicated sociopolitical shifts (2016, 136-138). Even as consciousness emerged that industry was destroying the bodies it exploited over time, U.S. workers were desperate for something that would permit their continued economic survival.

While the deindustrialization of Ashtabula was ongoing, the Fields Brook PRPs continued to work with EPA to determine assessment and remediation protocols for Fields Brook Superfund Site. Most of the PRPs entered into an agreement known as the Fields Brook Action Group (FBAG), which was represented by De Maximis, an environmental law and engineering firm. The PRPs broadly agreed to conduct the necessary assessments and pay for the site cleanup

in 1986, but there remained some disputes to resolve, such as the exact cost sharing mechanisms as well as disagreements with EPA over the thresholds to which some contaminants would need to be cleaned up. Notably, in multiple cases, the PRPs requested higher thresholds than EPA had prescribed for the cleanup, arguing with alternative science that their own thresholds would be acceptable. The back-and-forth process of debating which science would most effectively address human and ecological health concerns is a clear example of Foucault's (1972) infamous assertion that knowledge is discursive: biopolitical regimes (Foucault 2008) of environmental health are subject to and played out within document communications passed between corporations and the state. The regimes are therefore themselves constructed out of the documents and data passed.

The 1987 declaration of the Ashtabula River as an Area of Concern (AOC) under the GLLA amendments added yet another layer to the complexity of Fields Brook. Alarmingly, the AOC declaration indicated severely depleted fish populations and habitats in the river, threatening the very namesake of the Ashtabula. Because Fields Brook emptied directly into the River, it was a prime culprit of contamination, which added to the cost burdens of the companies involved. The River had also been affected by contamination from countless other public and private entities to such a point at which largescale litigation as had existed for Fields Brook was nearly impossible. Instead, the Ashtabula Port Authority convened and led a group of about 50 organizations, including many of those involved in Fields Brook's cleanup, to form the Ashtabula River Partnership. The Partnership was a public-private collaboration to fund and implement cleanup of the Ashtabula River.

> "We brought together the Fields Brook Action Group—19 different chemical companies—as well as the Ohio EPA, federal EPA, local and county government, and a bunch of other businesses and concerned groups. This was the first partnership ever of its kind to tackle a problem like that. There was a time when we thought it might never get done, but it did come together, and we got the River cleaned up."
>
> - Interview with Fred Leitert, Ashtabula OH, June 12 2019

Throughout the 1990s and early 2000s, the actual process of cleaning up Fields Brook and the Ashtabula River took place. Cleaning up Fields Brook was step one: as the primary source of toxic contaminants to the River and Lake Erie, cleaning up the Ashtabula River would be an exercise in futility without cleanup of the source contaminants first. FBAG eventually came to a series of agreements with EPA over what remediations would be implemented. Not all of the Brook had been declared part of the Superfund, but rather only that part that ran from the industrial facilities to the River. This greatly reduced the land area over which modifications would be needed. Early, FBAG proposed that the original Brook be buried under sediment with protective lining to prevent seepage, and that a "new Fields Brook" be constructed about a mile north to replicate the original ecology. However, EPA rejected that proposal, asserting that the ecological damage of burying the old brook and engineering a new one would take years to recover from; moreover, water flows across landscapes tend to be fairly predictable, and many flows eventually return to the original water path.

Instead, Fields Brook was ordered to be dredged, sparking one of the most ambitious environmental engineering projects to take place in Ashtabula since the dredging of the harbor

nearly 200 years prior. Complicating the process was the fact that Fields Brook ran through various private properties, including about 40 residential properties. Over nearly two decades, Fields Brook was methodically dredged to restore water quality to acceptable levels. The Army Corps of Engineers methodically removed contaminated soil and sediments along the Brook, then shipped it to contracting facilities like RES that incinerated it and placed it in landfills. The U.S. Department of Energy decommissioned RMI, tearing down several of the facilities. Many of the other PRPs underwent infrastructural modifications to their plants to prevent future contamination. Some, like ACME, closed altogether. Eventually after the Fields Brook cleanup was nearly completed, the Ashtabula River dredging officially began in 2006, ultimately removing 650,000 cubic yards of contaminated sediment and soil. Like those of Fields Brook, these too were buried in a specialized landfill. Figure 4.1 shows the landfill and dredging processes at work. The landfill is located about half a mile north of Fields Brook on State Road.

Figure 4.1: An aerial view of the Ashtabula River landfill, 31 August 2006. Photo by Fred Leitert.

The dredging and rehabilitation of Fields Brook occurred at the same time as deindustrialization was accelerating in Ashtabula County. My own birth in 1992 was marked by a brief recession that badly damaged President George H.W. Bush's popularity. Fields Brook's cleanup was a visual metaphor for the ongoing deindustrialization around me. Looking back, I can understand how the memory of that massive change to my town's landscape came to be associated with the impending darkness of a deindustrializing economy. But even during my own childhood, things never seemed "that bad." My parents both worked, but they were able to provide enough for us. We could not afford such luxuries as brand new cars, designer clothes, or even vacations—I actually never even traveled to a state other than Ohio or Pennsylvania until I took a college trip to South Carolina when I was 20 years old. In my limited experience, my own childhood in the late 90s and early 2000s in Ashtabula was ordinary. The people in hazmat suits down by the river were nothing unusual.

"…Then the bottom fell out": The Great Recession

> "You and my daughter, you graduated together, so you're not old enough to remember, but things weren't that good when you were growing up, either. Things started getting bad around here in the 80s, and they sort of plateaued for a while until about 2008. It was like, first it all went bad, then the bottom fell out, and it all took a couple decades, but here we are."
>
> - Interview with TS, Ashtabula OH, December 16 2018

This quote was taken from an interview with a close high school friend's father who works at one of the plants associated with Fields Brook. When this interview took place in late

December 2018, I had already interviewed about two dozen individuals and had some sense of the two different economic downturns. The first downturn, sparked by the onset of neoliberalism and characterized by simultaneous globalization of manufacturing and deindustrialization of the U.S. economy, took place in the 1980s. Its temporality was concurrent with CERCLA's most aggressive enforcement actions. When Congress passed CERCLA in 1980, President Carter was in the midst of an embattled re-election campaign that capped off a decade of U.S. environmentalism and liberal drift. Ronald Reagan's election meant a renewed conservative spirit, specifically touting the twin saviors of economic freedom and global integration. Reagan's neoliberalism, according to Sherry Ortner (2016), ushered in an era of backsliding economic inequality. The effects of this were felt first among the working class people who had, ironically, voted for Reagan. Ashtabula County was one such location: typically a Democratic stronghold due to its strong union culture, Ashtabula voted in favor of Reagan 49-43% in 1980 and again in 1984, 52-47% (Ashtabula County Board of Elections 1980, 1984).

Two things quickly became apparent as I interviewed more and more people of different generations. First, if you were born after 1980, then chances are you had never even heard of Fields Brook, let alone knew it was a Superfund Site. Of the nine interviews I conducted with informants under the age of 40, only two had heard of Fields Brook or knew what a Superfund Site was. Like me, both of these individuals held Bachelor's Degrees in environmental sciences, and cited their knowledge of and experiences with industrial contamination in Ashtabula as the motivating spark for their interests.

Second, if you were born during or after the 1980s recession, you tended to perceive Ashtabula as a generally good place to live while you were growing up, even when many adults

were beginning to grow pessimistic. Compare the following three quotes taken from a family lineage—three women born in 1939, 1968, and 1992:

> "In the 80s when I went to work for the water company, there were more poor people, including myself. I had to take on that job to support my family. You started to see more drugs and crime in town, and we got that public housing place... And then around 2006 or 2007, it got worse. Then it was the shops that had been around for years closing, not just the factories. You didn't think it could get worse but it did."

> "When I was a child growing up in Plymouth, we had a beautiful home. It was rural and peaceful. When we moved to the harbor during my childhood is when I started to notice more of the problems. The economy was not as good, and you started to have more problems with drug dealers, especially crack… In 2008 when the Great Recession happened, it all got even worse. Lots of people lost their jobs, and even though they hadn't paid well to begin with, that just made it even worse."

> "I grew up in the late 90s and early 2000s and Ashtabula was always a nice place to live. We had things to do: we had the Mall, Geneva-On-The Lake, high school football games… then I remember right before Obama got elected, around the Iraq War and stuff, the economy got really bad, and that's when things started closing. Stores in the mall, Mike's Farm Market closed… And I think that's when

> it started to get really bad here. Like it was still livable and peaceful before, but then we sort of lost all hope."

The last generation represented is my own. Drawing on my own personal network in Ashtabula, I was able to interview many of my own friends and acquaintances. Once my school aged peers, these are now some of the rising leaders of Ashtabula. I noticed a similarity among many of their comments to what the person above had said. One even brought attention to the emerging awareness we were reaching during our interview:

> "Growing up, I thought that my family was pretty average for Ashtabula, but now I realize that because of my Dad's factory job and the union, we actually were better off than a lot of other people. I never realized how many problems there were when we were growing up."
>
> - Interview with MS, Ashtabula OH, Dec. 20 2018

Unlike my friend, I became more personally aware of the economic turmoil associated with the Great Recession. My own mother, who lacked a high school education, started having trouble holding a job: laid off here, furloughed there. Her wages stagnated, and my father took on a second job at Lowe's Home Improvement, where he worked an average of 25-30 hours per week in addition to his full-time job as an investigator for Child Services. School clothes were frequently purchased either from Wal-Mart or, on special occasions, from JC Penney using Mom's credit card. The vehicles my parents owned tended to get replaced less often, until eventually they were forcibly replaced as they could no longer afford payments.

During this time, their health suffered greatly. Both of my parents were overweight, and they were frequently stressed, yelling at each other and their three children, trying desperately to hold it all together. Our house was frequently chaotic, dirty, and laced with the odor of cigarette smoke—both of my parents were heavy smokers, consuming a combined average of three packs every day. My own Dad's poor health habits eventually caught up to him in late 2009, when a strangulated hernia threatened his life. He was eventually admitted to the hospital on January 21, 2010—the night before my 18th birthday—to have an emergency surgery to save his life. This in turn led to a need to catheterize his heart with a stent upon discovery of a blockage. The total medical bills exceeded $500,000. Insurance covered 80% of the cost, leaving my parents with $100,000 in medical debt, in addition to $20,000 in credit card debt accrued over the years. The horrors of the Great Recession were all too real to me, but I had never realized that they were the culmination of thirty years of deindustrialization.

I grew up attending Edgewood High School in Ashtabula Township. During my time in high school, I was aware of our school's declining funding and student body. It was apparent in the form of teacher retirements that were not replaced, positions cut to part-time, and the introduction of "pay-to-play" sports and other extracurricular activities. One staff member I interviewed said this:

> "Those chemical companies paid a lot of taxes to the local areas and county. That's a big part of why Edgewood was such a good school: they had the funding from the chemical company taxes, plus the property taxes from all of their well-paid employees."
>
> - Interview with CH, Ashtabula OH, March 4 2019

Around this time, a new discourse about Ashtabula came about. The word "Trashtabula" was used frequently by fellow youths when I was growing up to describe the perceived squalor of where we lived. Even still, I was unaware of the connections between ecology and industrial decline. My childhood preoccupations had left me blissfully unaware that I was growing up in the crater of an already blasted landscape when the Great Recession began. From my interviews, it appears that this sentiment was shared by others of my generation.

The Rise of Rural Resentment: Damaged Bodies, Plighted Citizens

As chemosocial arrangements of livelihood and prosperity evaporated in the wake of the Great Recession, a new sentiment of disaffection replaced them. Political scientist Katherine J. Cramer (2016, 56-84) describes what she calls the "contours of rural consciousness" that constitute an identity politics based on rural resentment: these are power, values, lifestyles, conceptions of hard work, and resources. Ashtabula is a microcosm for this world in distress; like Cramer's field site in rural Wisconsin, my own field site in rural Ohio provides insights into the contexts and contours of rural consciousness.

Present-day Ashtabula is mired in a continually stagnant economy. Population loss has continued at a rate of about 2% each decade since the 1980s. Much of the exodus are the young and well-educated, leaving behind an increasingly uneducated, impoverished, and elderly populace. This, in turn, places increasing pressure on government, healthcare, and other human services. With fewer good jobs available than ever, the tax base of support is lacking, too: unemployment peaked above 10% here in the aftermath of the Recession, and remains around 6-7% on average today—slightly higher than state and national averages. Ashtabula County's

cancer incidence rate (470.8) and mortality rate (197.5) are both higher than the statewide rates (459.8 and 181.1) and national rates (442.7 and 166.1) (Ohio Department of Health 2019). Widespread health issues were mentioned numerous times by informants as social markers of economic turmoil:

> "In Ashtabula, you see lots of diabetes, cancer, obesity, high blood pressure, and other issues associated with lifestyle and low socioeconomic status. I wouldn't say it's unique to this area, but it's probably common among areas like it."
>
> - Interview with AR, Ashtabula OH, Dec 5 2018

> "I worked in a nursing home, and the number of elderly people around here with Parkinson's, Lou Gehrig's, dementia, Alzheimer's, and other neurological problems is staggering. For our population it's a lot of people, and it places a real burden on our healthcare providers and social workers."
>
> - Interview with SH, Ashtabula OH, Dec 6 2018

> "It seems like everyone around here gets cancer eventually. There are all kinds of cancers: stomach, lung, brain, skin, breast. And it seems like there are a lot of people who get this weird unidentifiable cancer, like the doctors can't tell where it originated. It's so widespread by the time it gets found that they can't tell where it started."
>
> - Interview with KH, Ashtabula OH, Dec 8 2018

The opiate crisis that has ravaged American communities is also prominent here, and is part of the overall chemosocial process linking nature, health, and industry. Everyone, including me, knows at least one person who has been addicted to opiates. More than once, my informants made statements that made clear they saw a connection between deindustrialization and drug addiction:

> "There's nothing to do here. There's no hope. Everybody is bored and depressed, so they sniff or smoke or snort or inject or eat something that makes things go faster. Numb the pain."
>
> - Interview with RM, Ashtabula OH, Dec 10 2018

As I discussed in the introduction to this dissertation, a number of pundits and scholars have pontificated about the Midwestern "culture in crisis" (to use J.D. Vance's terminology). The "economic anxiety" argument, as it is sometimes derisively called, proposes that white working class voters have turned to a formulation of ethno-nationalist economic populism out of fear and protectionism for their communities. In Ashtabula County, this was represented by the region's status as a "bellwether," going for Trump over Clinton by 57-38%. However, as I discuss in later chapters, the perception of decline has somewhat leveled off, with many Ashtabula residents perceiving their votes for Trump as a hopeful reinforcement of white identity politics rather than a resentful or angry one.

To paint this shift as a purely populist revolution misses the deeper class politics and massive wealth behind the political apparatus that worked to get Trump elected, particularly by voter manipulation and suppression (Gusterson 2017). Gillian Evans (2017) wrote that

deindustrialization in the U.S. and U.K. has reconfigured class politics "into a new form of cultural nationalism" (215). He argues that disorientation in addition to precarity is now the postindustrial condition, and that the two events in question have produced a global society in which that precarity is felt around the world. Bonvillian (2016) has moreover pointed out contemporary nationalist populism is rooted in the alienation of laborers from their processes and products *vis-à-vis* the rapid decline in American manufacturing since 2000. More than 8 million manufacturing jobs have disappeared since that time, even as U.S. productive output has increased (Smil 2013).

Anna Tsing (2005, 216) predicted such a backlash to globalization when she wrote of the friction that governs relations between the local and global. Tsing cautioned that emerging populist backlash she was witnessing in Indonesia and elsewhere had been historically entwined with structural racisms both overt and subtle. Deindustrialization produced two significant events in 2016 that were foreshadowed in Tsing's ethnography: the referendum by the United Kingdom to exit the European Union and the election of Donald Trump as President of the United States. While the importance of each of these events may be inflated in the cultural imaginary, their symbolic stature and the broader trends they represent should not be underestimated, and are integral to understanding how environmental injustices are interpreted by white Americans living in the Rust Belt.

The populism characteristic of Trump's political movement is notable for its exploitation of alienated workers and plighted citizens. The remaining chapters in this dissertation detail the histories, political economies, and social arrangements of specific chemicals in more detail to satisfy the stated purpose of this dissertation: to produce a chemo-ethnography of Fields Brook, including the present-day experiences of people living and working near it. How does this more

recent history fit into the timeline of chemosocialities? I argue that chemical interactions facilitated the economic and cultural conditions that motivated citizens toward a populist political ethos. Benson (2011) has called this sentiment "plighted citizenship;" he and Westermeyer (2016) have observed this as a basis for white working class political identity. Lived experiences of contamination and deindustrialization convince some among the white working class to develop a sense of plighted citizenship in response to feelings of being left behind by government and corporations.

Conclusion: Ashtabula's Environmental History as an Assemblage

Located at a juncture of mountains, waterways, and plains, Ashtabula County was uniquely situated in the Midwest to facilitate the transport of many resources crucial to urban metabolism. By tracing the geologic history of this region, I showed how environmental processes are important in setting the conditions for human livelihoods. Ashtabula's fortuitous location allowed it to be a nexus for the transportation of these various resources across landscapes, facilitating the frontier empire of the United States. This was instrumental in the implementation of so-called "manifest destiny."

The industrial giant that once was, the Midwest's iron and steel have given way to a Rust Belt where unemployment is high, wages are low, and people die of overdoses and cancers at rates far above the national average. Ashtabula County is thus a cautionary tale in the dangers of capitalism: pro-growth philosophy may improve conditions in the short term, but in the long term the harmful effects produce landscapes so blasted that it becomes difficult to envision how hope could possibly exist in such a place. It is furthermore a case study in the environmental and economic conditions of rural places that make them susceptible to rising nationalism today.

Bodies in these spaces are poisoned and exploited repeatedly for profit without regard to the harms inflicted.

Ashtabula's historical trajectory has also been profoundly shaped by political and economic forces far beyond its boundaries, especially at the federal level. Most recently occurring with CERCLA, Ashtabula has been subject to policy regimes that have fundamentally altered its environmental landscape and reshaped the relations within its assemblage. The recent history of Ashtabula has been profoundly altered by the chemical industries that have existed since the 1930s. The social structure of Ashtabula has ebbed and flowed in relation to these factories: the rise of union politics in the mid-twentieth century, with good wages and educated management, gave way to a prosperous, middle-class community; the subsequent decline of chemical industries have pulled the economic rug out from underneath countless people, resulting in a damaged and depressed community, looking for a way out.

Chapter Five: Violated and Furious

In memory of Beatrice Silverberg, 7/20/1919 - 10/12/2019

Introduction: Depleted Records

> *RB: "I've heard from a lot of people that RMI worked with depleted uranium cores and possibly manufactured bullets made out of Uranium for use against Russians. Since the company is long defunct, I was wondering if you could tell me about what RMI manufactured?"*
>
> *RR: "I cannot speak to that one way or another."*
>
> - Telephone Interview with FBAG Representative, April 10 2019

This chapter is about the dark side of U.S. manufacturing: its inextricable link to the military-industrial complex and thereby its responsibility for creating products intended to take lives. U.S. manufacturing entered its heyday during the post-World War II economic and population boom. Throughout numerous military engagements in the twentieth century, increasingly advanced weaponry necessitated new responses. The "Atomic Age" was thought to be the U.S.'s pinnacle achievement of science and society in WWII. Into the 50s and 60s the atom and nuclear energy continued to hold reverential status as solutions to modern problems. It was not long before nuclear technologies laid their roots in Ashtabula, setting off a chain of

events that, when looking back, was one of the main junctures that finally elicited a public response about Fields Brook's pollution.

What makes this chapter both so difficult—and scary—to write is the extent to which this legacy has been covered up by corporations and various levels of government. As I quickly discovered, the entities responsible for radionuclide contamination of Fields Brook went to great lengths to ensure that historical records contained no direct attribution of fault. The chemosocial legacy of uranium is one shrouded in the mystery and deceit of non-disclosure agreements (NDAs). It is a known fact that there is radionuclide contamination present in Fields Brook. What is not a "known fact"—in other words, what has not been recorded in these documents—is precisely *who* in the State Road industrial complex was using radionuclides in the first place. This chapter identifies the culprit by name: Reactive Metals, Incorporated.

In this chapter I explore the dichotomy between "real" and "perceived" risks that exists in environmental science policymaking, and how this dichotomy is at times fabricated through the selective inclusion of facts in official documents. Beck's (2009) theory of modern risk society posits that the proliferation of technologies, media, and knowledge created a global society of individuals. Consequently, Beck warned that this increased individuation detached humans from groups, leading to increased mistrust. Here, I seek to understand how and why the perception of nuclear risk elicits activist responses which are stronger than those to other chemical risks.

At the same time, this chapter presents an exercise in risk taking in activist anthropology. Some of this information was kept hidden for decades by non-disclosure agreements, workplace cultures of intimidation, and public relations campaigns of denial. The information I uncovered made me fear for my own bodily health—had I been unknowingly exposed to nuclear contamination throughout my youth? But it also made me fear for my present self: Would I

experience retribution, including possibly a lawsuit, for publishing this information? Would my reputation be tarnished for choosing to voice my findings? Here, I invite these vulnerabilities as part and parcel to my duty as an engaged, native ethnographer.

Chemical Profile: Uranium

This chapter frames risk and activism as products of chemosocialities of the element uranium. Uranium is a heavy metal commonly found in various rocks and minerals. It is a component of most of the Earth's crust, which leads in turn to its presence in small concentrations in most surface rocks, seawater, and some layers of soil. Geologists believe uranium to have been formed during the expansion of the supernova that eventually became our solar system; surprisingly, uranium is not a common element therein, but rather is concentrated largely on Earth (Royal Society of Chemistry 2020).

Uranium is an unstable element that continuously undergoes radioactive decay.

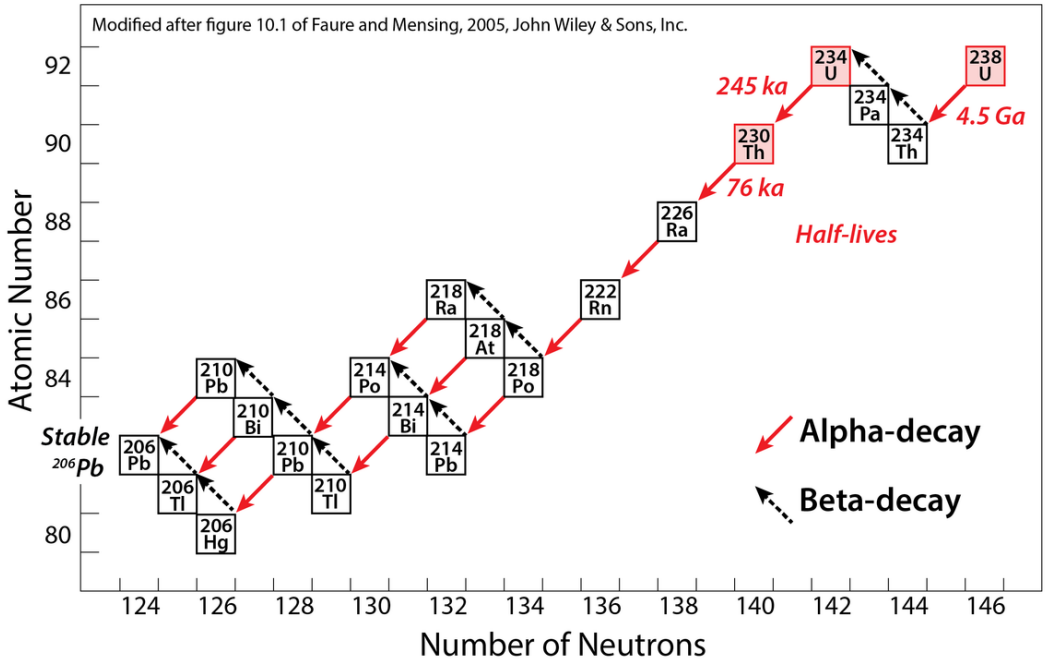


Figure 5.1: Decay chain of Uranium 238 to Lead 206. (Faure & Mensing 2005).

Radioactive decay is an elemental process by which an unstable atom loses energy as it sheds atomic particles—usually electrons or neutrons. As it does so, uranium alchemizes to become new elements, eventually ending up as the stable Lead-206 isotope (Faure & Mensing 2005). The process of uranium decay is a source of energetic release, and is one of the main drivers of the Earth's internal heat. Figure 5.1 below shows the decay chain for the isotope Uranium-238.

There are two major isotopes of uranium. Depleted uranium is a natural by-product of uranium enrichment, which produces the radioactive isotope we commonly conjure up when we hear the word uranium. Enriched uranium contains elevated concentrations of the uranium isotope U-235, a fissile isotope useful in producing nuclear energy. Depleted uranium is composed primarily of U-238, a much more stable compound, but still contains trace amounts of U-235 (U.S. EPA 2019). Prior to the Cold War, depleted uranium was stored and disposed of as a waste material; however, upon the revelation in the 1960s that the Soviets had developed bullet-resistant armor, the U.S. Army launched a series of materials tests, and found that depleted uranium was an ideal material from which to produce armor piercing bullets (U.S. Department of Veterans Affairs 2018).

According to the U.S. Center for Disease Control (CDC), uranium's adverse health effects on living organisms are a product of chemotoxicity, not radiotoxicity. Chemical reactions between uranium atoms themselves—not the decayed radioactive particles they shed—and living cells lead to uranium's main health impacts. Uranium contamination most notably affects the kidneys, where it can lead to illnesses including cancer. This is because human bodies recognize uranium as foreign and accumulate it in the kidneys as a means of disposal via urination.

Uranium dust, usually encountered during mining, can have similar chemotoxic effects on the lungs and respiratory tract (ATSDR 2019).

In Ashtabula, Reactive Metals, Incorporated was contracted in 1962 as one of the nation's leading producers of depleted uranium. The facility already owned and operated two plants for decades: a titanium plant and a sodium plant. A third plant was also located in Youngstown about an hour south. The introduction of a uranium extrusion plant created plentiful good paying jobs in the community. However, it also led to controversies. RMI operated secretively, with many employees kept in the dark about the materials with which they worked. According to the U.S. Department of Energy (2018), RMI "operated a facility on the property that manufactured metallic uranium tubes and rods and experimental quantities of thorium metal for use in the Hanford, Washington; and Savannah River, South Carolina, weapons program reactors. RMI also extruded depleted uranium and nonradioactive materials, primarily copper-based, for the private sector." When one compares DOE documents to those of the EPA, however, there is an important discrepancy that stands out: nowhere in the over one-thousand publicly available documents does RMI accept responsibility for radionuclide contamination of Fields Brook.

Uranium, a source of modern energy, warfare… and secrecy. Early in my research process, as I was reading these documents, I wondered: why were so many chemicals attributed to specific PRPs in the FBAG *except* the radionuclides—uranium and radium? Various industries took responsibility for specific contaminants and quantities thereof during the FBAG negotiations, but there was no record of attribution for radionuclides. Uranium's chemosociality in this chapter is therefore one of considerable uncertainty and risk.

Searching for the Truth

Throughout my fieldwork, I constantly felt like a detective trying to piece together a crime that had happened long ago, the evidence of which had been scrubbed and the witnesses to which were mostly dead and gone. Even though I grew up in Ashtabula, I had somehow made it more than twenty years without ever hearing about radionuclides in Fields Brook. It was not until an early interview with an employee of the Ohio Environmental Protection Agency who oversees continued hazard management at the Superfund Site that I learned this information:

> RW: "With regards to hazard management, we at the EPA have to defer to the Department of Health. So for example, the radionuclides we monitor at the site have to be reported to ODH, and they determine the threshold, which we have to enforce.
>
> RB: "Radionuclides at the site?"
>
> RW: "Yes, radionuclides including uranium and radium were present in Fields Brook."
>
> RB: "How did they get there?"
>
> RW: "I don't really think it's my place to say that. You will have to read the documents."
>
> - Telephone Interview, 9 September 2018

I did not ask the employee *why* he could not answer my question. Looking back I suspect that he was bound by the same litigation agreements that had hidden the contamination source in official documents. This was the first in a long series of dead ends to what I naively thought was

a simple question: who had dumped uranium in Fields Brook? After my conversation with this and other EPA officials, I spent several weeks poring over the more than 1000 official documents on Fields Brook in the public record, trying to find out more about the contamination. Nowhere could I find a source attribution, but several times the name RMI came up. I Googled the company, and discovered the U.S. Department of Energy had listed the company's property under its Office of Legacy Management as a decommissioned site. It appeared logical that RMI was responsible, but I could find no further evidence.

A few months into the research process, in December 2018, I shared a Facebook post seeking more information from local friends and family about RMI. I was shocked when I received a message from my very own Great Aunt Shirley, who moved out of Ashtabula when I was a child and now lives in Missouri:

> "I worked at RMI for nearly 10 years at both the Sodium and Extrusion Plants. That was a long time ago (left in 1979) but if I can help let me know. I was Plant Manager's secretary and had to have Top Secret Security Clearance when I worked at the Extrusion Plant."
>
> - Facebook message, 1 December 2018

I had struck gold. Here was someone with the highest level of access one could imagine to some of the answers I had been seeking. We conducted a telephone interview, enjoying the time catching up as family as much as we enjoyed this newfound shared interest. As a child, I had fond memories of hiking with my Great Aunt in the woods where my Papa would practice

shooting his rifle. We had shared a unique family bond, and I found as an adult that even though we had not seen each other in ten years, that bond was still there.

From there, my luck began to improve, but not without difficulties. Because RMI had finally closed in 1997 after 10 years in decommissioning, it had been more than three decades since manufacturing workers operated at the plant. As a result, many of the older workers who had once been employed at RMI were dead or had moved out of Ashtabula. This presented a significant problem for me in trying to learn more about how and why RMI was linked to radionuclide contamination in Fields Brook. Throughout this process, I relied heavily on social media, especially Facebook and the online group Growing Up in Ashtabula, to identify informants.

My outreach was alternately successful and unsuccessful. In all, I found four former RMI employees who were willing to be interviewed for this research. I also located and identified a fifth employee who, while not employed by RMI, was previously an employee of Ultimate Chemical Solutions, which operates in RMI's former titanium extrusion plant. In addition to these, I also located two key players in the Fields Brook and Ashtabula River cleanups who had been managers at the RMI plant. I was initially excited to have identified knowledgeable experts such as these two men; however, my excitement was short-lived. After my first conversations via Facebook messenger with one of the former managers, I sent him the interview questions via email. Upon learning more about what I was seeking to talk to him about, this man blocked me on the social media site and ceased responding to my emails. Shortly thereafter, the other manager sent a message on the platform, indicating that he was sorry but that he had changed his mind, as well. One thing this manager said that stood out to me was this:

> "When I worked for RMI I had the full support of the company behind me when dealing with the operation of the plant, the public, media and press or any entity that might challenge what I was saying or actions I was taking in my various positions with the company. Today being retired for the past 17 years, what I say or do now on activities that occurred 30-50 years ago, if challenged/questioned for any reason by individuals, community, state or federal government is totally for my account and self-defense. As a person enjoying retirement after a great career with one company, I have decided that potential risk simply would not be prudent for me or my family."
>
> - Facebook message, 3 May 2019

This remark stood out to me both for its simultaneous obscurity and transparency: on the one hand, he was clearly careful to craft this statement such that he did not say anything incriminating in too direct a fashion. On the other, his meaning was still loud and clear: if I speak without my company's permission, I am afraid they will come after me.

For the most part, these conversations and governmental sources constituted the bulk of information I was able to locate about RMI's nuclear activities. Throughout my interviews I asked informants repeatedly if they had heard rumors about nuclear contamination. By and large, I found that most of my fellow Ashtabulans were as ignorant as I had been of the bomb in our backyard. In my 65 interviews, when I found someone who was familiar with the mythology, they tended to be fruitful, providing even more resources. It was a local water pollution activist who first told me about the blog *One Mile From Home* that Ashtabula resident Gary Zalimeni had published about the nuclear contamination in Fields Brook. The chain of events preceding

this was rather interesting: during my conversation with members of Ohio EPA, I had been informed that he had recently given a presentation to the Ashtabula League of Women Voters about Superfund redevelopment opportunities. I contacted the League's President, Mary Howe, who introduced me to the Water Watch. *One Mile from Home,* published in 2015, presents Zalimeni's firsthand account as a resident of Ashtabula who grew up just downstream from RMI along Fields Brook. In the absence of firsthand accounts from individuals I could meet in person, this blog represented a form of storytelling about the environmental injustice, a publicized narrative that could shed insight into possible interpretations of the nuclear age.

As I searched for people who had worked at RMI and came up short, I was blessed with the good fortune of locating another important class of people: residents who had protested against RMI. In Zalimeni's blog, I was shocked to learn that the international environmentalist organization Greenpeace had actually come to Ashtabula in the late 1980's to protest RMI's contamination into Fields Brook. I was able to meet and interview four people who were involved in two separate protests against RMI to learn more about how whispers of RMI's nuclear activities were making their way through Ashtabula via word-of-mouth.

What follows is my attempt to piece together the process by which RMI's nuclear activities became public knowledge. The publicization of this information took place over several years and was primarily driven by illegal leaks: whistleblowers who worked within the facility anonymously providing information to family, friends, and activists on the outside. Because these are the accounts we must rely on, contemporary paradigms of scientific knowledge have favored the scrubbed documentation of the EPA which does not directly assign cause. However, this is not the only source of legitimate truth: as I came to find out, the drip-drip

of information to employees eventually made its way to the outside, where hysteria and panic erupted into activism and mistrust.

The Politics of Knowing on the Factory Floor

Who knew what, when, and how at RMI was the subject of a complicated network of politics, identity, and rumor. RMI was a notoriously challenging company to research for this reason. Based on my extensive conversations with residents, including several former employees, as well as my consultation of various archives, it appears RMI maintained a strict culture of secrecy. Moreover, the economic support the company provided to Ashtabula for decades prompted many residents and former employees to defend the company, even while acknowledging the harm they had caused.

To protect the secrecy of their nuclear activities, RMI employees received information on a "need to know" basis, as determined by the company. Often, the "need to know" did not align with industry or safety standards. One plant nurse I interviewed recounted her horror when she began working at RMI:

> "I worked at Elkem Metals prior to RMI, and when I was there, all of the nurses were trained to understand the facility, the compounds, the machines… that way, if someone was injured, we would understand how and what had happened and we could treat them safely and properly. When I started at RMI, there was no floor tour. I asked about
> employee health records, and was told that that was off limits. The files were held in a padlocked file cabinet that only the plant managers had access to. When I

> asked an older nurse why things were like that, she told me simply: Nobody gets out of here without cancer."
>
> - Interview with MC, Ashtabula OH, Mar 6 2019

A serious workplace accident cemented her fears:

> "While working, I received a call from one of the floor managers: a worker who had been working with a hydraulic press had crushed his hand. The floor manager was in shock and didn't know what to do, so I immediately began to ask questions: "What was he working with at the time?" I needed to know so I could get over there and administer treatment, which can vary based on the material you worked with... The manager just said okay, and hung up the phone! The next day, all over the front page of the Star Beacon, was the headline: "INJURED RMI EMPLOYEE CONTAMINATES ACMC EMERGENCY ROOM." It turns out he had been working with the extruded uranium. The managers didn't follow any of the safety protocols to clean him up before transporting him, and so they had to decontaminate the whole hospital as a result."

This nurse left RMI within three weeks of gaining employment there, refusing to be complicit in what she saw as a dangerously secretive work environment. This small act of resistance is significant in showing the discomfort that RMI's own employees had with the lack of information they were given about potential risks. Such small acts, I am told, were

uncommon, but those who took them began to spread concern among community members, slowly accumulating a critical mass of concern.

RMI's secrecy also extended to their contractors. One informant told me how, as a teenager, he worked for his father's family business delivering tanks of volatile gases to various companies around Fields Brook. One such company was RMI. The man vehemently denied that RMI had ever worked with radioactive materials, insisting—as the company had done for years up until the late 1980s—that they extruded various other types of metals. Also, in the blog *One Mile from Home*, Ashtabula resident Gary Zalimeni similarly writes that his unnamed neighbor, who had been contracted to perform roofing work at RMI in 1978, was stopped as he exited the building and had two employees "wave a machine over my entire body." The man was apparently not told why this was taking place, but he and Zalimeni deduced that the device was likely a Geiger counter. These two examples show that RMI was not informing some contractors about the presence of radionuclides at their facility.

RMI's silence on uranium was a persistent theme of my Nancy Drew-esque adventure. Even though there are government records verifying the manufacture of radioactive materials took place at RMI, the company's official line seems to be to pretend the problem is not there. Even in later years, human and environmental safety appear not to have been company priorities. The Nuclear Regulatory Commission fined RMI $18,000 in 1999 for creating a "chilling effect" by placing a worker who had repeatedly warned management of ongoing uranium contamination in waterways on involuntary leave (Federal Register 2002). After the employee was placed on leave, management distributed a memo to other plant employees ordering them not to correspond with the employee, and actively worked to tarnish the employee's reputation through an informal network among plants managers.

For decades, RMI's continued operation in the community meant suppressing rumors of radionuclides on site. Employees were frequently fearful that if they spoke out, they would lose their jobs, their health insurance… or worse. The denial went on for years, until finally Fields Brook was declared a Superfund Site. A local journalist described the sudden turnaround in our interview:

> "For years and years, RMI told us there was no uranium whatsoever on site, in the soil, in the water, or anywhere! Then, all of a sudden, 1986 comes along and Fields Brook is a Superfund Site, and oh—NOW they suddenly realized they've been leaking uranium and dumping it all along! And to add insult to injury, they rebranded themselves as "Earthline Technologies" or whatever to appear more "environmentally friendly" and they got a government contract to clean up their own mess. Talk about corporate and environmental incest."
>
> - Interview with CF, Ashtabula OH, Dec 16 2018

RMI really did rebrand themselves as "Earthline Technologies" as part of a public relations move to appear more attractive to U.S. EPA and DOE funders for the cleanup (Federal Register 2002; Kuz 2002). RMI argued in court that the original terms of their DOE contract obligated the government to give the company first dibs on cleanup. Moreover, RMI also argued that the government had a patriotic duty to RMI. Because the company had operated in service of national interests, they claimed, the government should view the contract as a form of restorative justice for the community. The few RMI workers remaining in the late 1990s were hastily retrained in nuclear hazard cleanup. The project dragged on for years longer than its original

timeline and was subject to numerous cost overruns, adding to the public perception that RMI and the DOE were locked in a dirty parasitic relationship, with U.S. taxpayers footing the bill for the company's repeated mishaps.

In the late 1980s, employees attempted to blow the whistle on RMI's practices, contacting the non-profit organization the Government Accountability Project. A few representatives of the group traveled to Ashtabula to request documents and interview workers. They stayed overnight with a local resident and awoke to find their car windows smashed in. The message was loud and clear: don't mess with RMI.

A Tale of Three Protests

The idea that a company like RMI, which at one time had well over 500 employees between its three facilities, could keep its uranium operations entirely under wraps was, in hindsight, ludicrous. However, industry culture was different back then. Many Ashtabula residents were the children of immigrants who valued the steady employment and benefits a company like RMI provided. Moreover, they also recognized the multiplier effect it had on the local community. The titanium and chlorine produced at the other two plants fed into processes at numerous other facilities in the area. All of this created a local culture hospitable to business and hostile to dissent.

However, eventually, word began to leak out about RMI's operations through various sources. For the most part, disgruntled employees and contractors unbound to non-disclosure compliance were the ones who started to speak out. In all of the records obtained, the concerned employees or contractors went to great lengths to remain anonymous, so it was impossible to track them down today. Each went to an outsider for representation—the two injured employees

spoke to Silverberg, for example, while Zalimeni's informant was an unnamed neighbor. As time passed and residents learned more information through social networks, murmurs of concern erupted in the community. The outspokenness of a few individuals eventually led to three protest events.

Protests are important cultural events that signify dissatisfaction with present social orders. Melissa Checker and Maggie Fishman (2004) defined "cultural activism" as "the range of collective and public practices and strategies that people use to alter perceptions, ideas, and understandings for the sake of social change" (5). Protests are important events of cultural activism in which people come together to perform a particular vision for the future (Willow 2012). Framing environmental justice movements poses an important challenge for activists to draw concern and elicit change (Milton 1996; Taylor 2000; Checker 2002). Here, I examine uranium as a framing device around which protest movements are formulated. I found that people who led protests centered their rhetoric on themes including transparency, justice, and responsibility.

"When Gary Zalimeni raised Hell"

Repeatedly, informants would tell me the same thing, in more or less the same words: "Everything changed when Gary Zalimeni raised Hell at that city council meeting." Zalimeni himself wrote an account of his experiences in 2015 in an online blog titled "One Mile from Home." According to Zalimeni's blog, he spoke with a neighbor in summer 1978 who had been contracted to perform construction work at RMI that year and who had been waved down by men with a Geiger Counter. Suspicious, Zalimeni attended a city council meeting a few days later, and asked what he thought was a simple question: "Are any of you aware of a facility in

this area that handles radioactive materials?" Shockingly, one member of the council replied that yes, he had worked at RMI and that they extruded uranium for nuclear weapons programs. Based on written and oral accounts of this meeting, the entire community lost control at this point, and the meeting had to be adjourned due to the chaos. One woman who had been present had this to say:

> "Everything just erupted into total chaos. Gary had said out loud what nobody was supposed to say. There had been whispers about what RMI did, but nobody dared to call them out so directly, for fear of getting a family member or friend in trouble. And the fact that the councilman was so brazen about revealing what was then a top-secret government operation was shocking to a lot of people in the room who also worked for and were loyal to the company. On top of all that, you had the inevitable question: is this really so bad? I think the councilman wanted to try and tell us it was safe, but I don't think very many of us believed him, and that created another layer to the problem."
>
> - Interview with AR, Ashtabula OH, Dec 28 2018

Following the meeting, Zalimeni found himself at the center of a vicious whirlpool of controversy. Immediately after the televised city council meeting, he was contacted by local attorney Gus Lambros. Lambros was a popular local figure, although a controversial one with the benefit of hindsight: Lambros had defended the Ohio National Guard a few years earlier in the case concerning the infamous Kent State University shootings. It is important to note that at this point in his blog, Zalimeni takes care to frame this positively, regarding Lambros as a "close

family friend." Elsewhere on the site, Zalimeni rants about "chemtrails" above his retirement home in Scotsdale, Arizona. This is indicative of a general suspicion toward chemical and the government, perhaps shaped by his earlier experiences in Ashtabula.

Lambros, Zalimeni, and ten other locals formed the Ashtabula Pollution Abatement Committee (APAC) in response to the controversy. The committee engaged in activism by making multiple document requests to RMI, the NRC, and the DOE. Frustrated, they found that many of their requests for information were denied, and so APAC contacted Dr. Eskil Karlson, a nuclear physicist residing in Erie, Pennsylvania—about a 45-minute drive from Ashtabula. In 1980, APAC took eleven soil samples from across Ashtabula County. Most such samples were taken in the neighborhoods in closest proximity to RMI, and one brave trespasser claimed he was even able to sneak a sample from the company's property. One sample was intended to be a "background" sample and was taken from further away in the county, though the exact location is not described. The findings produced what Zalimeni referred to as "chilling results": even the background sample was contaminated with uranium, and it was strongly suspected that this contamination had come from RMI due to a match in the electrochemical signatures of the measured ions. All of the local samples contained traces of radioactive elements including uranium, radium, and thorium. The results of these tests are documented in publicly available documents published by the NRC, verifying their accuracy as well as documenting the lasting impacts of citizen science in the Fields Brook case (NRC 1986).

After the results of the soil tests were made public, public rumors and outcry continued to grow. RMI employees remained under strict non-disclosure agreements, and so feared for their personal livelihoods if they said too much. Zalimeni espoused conservative views at times, claiming that he did not want his movement to be associated with "radicals" and chafing at the

public suggestion by one RMI manager that he was a “communist plant.” At the same time however, the cadre of activists comprising APAC had undeniably stirred public interest. Despite RMI’s clear desire to silence talk of its activities, it was clear there was no going back after Gary Zalimeni’s soil tests.

Peace, War, and Nature

In early 1983, Ashtabula resident and longtime activist Bea Silverberg met with two employees of RMI who claimed to have experienced workplace related illness. In her memoir, Mosaic & Memory (2018), Silverberg described meeting with the two emloyees:

> “We were huddled over a corner table at McDonald's after a prearranged meeting in the parking lot. It was 1983; Dr. Bob and I from the Ashtabula Peace Council were listening to two workers from the Reactive Metals Inc. (RMI) Extrusion Plant relate their grueling story… But the thing that riveted Bob's and my attention was their skin, on both their faces and arms. It was GREY-BLUE in color and looked like the texture of hard leather. Each man had worked more than fifteen years at the Ashtabula RMI plant which processed and extruded uranium hexafluoride into radioactive ingots for use in nuclear weapons. The workers' health problems had surfaced after being in the plant more than ten years and had never been diagnosed nor treated to give them any relief for their symptoms. The ailments, neurological and organic, were severe enough for them to have to stop work, and they were enduring great stress, weakness, and pain. The company denied any responsibility for their condition, and to their knowledge, other workers in the plant were not being screened for possible health effects of the

> industrial radioactive environment. The two workers and the wife spoke in hushed voices, reminding us that by telling their stories, they were at great risk of being punished by the company which was still paying minimum benefits (83)."

Following this meeting, Silverberg organized a protest of the Ashtabula Peace Council, a local group of anti-war activists, at RMI. Silverberg was a prominent international peace and justice activist. At the time of our meeting in March 2019, she was 99 years old. On a cold, snowy day I drove to Menorah Park, the nursing home where Bea resided. I met Liz Coblentz and her son, Isaac, in the lobby where they greeted me. Isaac had facilitated the connection: after seeing one of my Facebook posts, he reached out to me via phone call and introduced me to Bea. When Bea and I first spoke over the phone in late January, she admitted she was uncertain that she would survive until my next planned trip to Ohio in late February. She sent me the previously quoted segment of her memoir, and I read it with extreme fascination. I had no idea about the RMI protests until this point, and knew instantly that I had come across something important.

Isaac, Liz, and I greeted each other and made our way to the cafeteria, where we helped ourselves to pizza, chips, and citrusy soda. Isaac pushed his mother's wheelchair while she carried both of their food, and we made our way to Bea's room, where I was greeted like an old friend she had known for years with a big hug. Bea and Liz exchanged a look upon meeting me, and Bea said to Liz, "Oh he's fine. He's not a Trumper." This comment immediately reminded me that, despite the good will I was offered by my informants, there were still reservations to speak out against the companies who perpetrated Fields Brook's pollution, and by extension there would be reservations about my agenda. I am not sure what about my demeanor gave away to Bea that I was not a "Trumper". Perhaps it was the fact I was, at the time, wearing my USF

Anthropology shirt emblazoned with Ruth Benedict's quote, "The purpose of anthropology is to make the world safe for human difference." Or perhaps my sexuality was apparent and they deduced that a gay man studying anthropology was unlikely to be a Trump supporter. Regardless of the reason, I felt an instant kinship with these three much older adults.

We sat in Bea's room and ate our lunches while the wind whipped snow flurries outside. Throughout the interview, I nervously rubbed my hands, which were irritated by dry skin. Bea, Liz, and Isaac spoke of a more prosperous Ashtabula, where citizens not only had jobs but also participated in their local communities. The trio insisted that the organization of the protests on RMI would be impossible today because as time went on, Liz and Isaac observed that Ashtabula residents became concerned with "other things:"

> "One positive thing, I suppose, that came out of all that industry was that a lot of people had good paying jobs. The management at the plants especially tended to be more white-collar, and those were the folks who participated in civic and political life… When those jobs went away, there weren't as many people to do that, and everyone else was worried about other things, like feeding a family."

The Ashtabula Peace Council was a collection of local citizens, most of whom were concerned about the proliferation of wars in which our country became entangled. Many of the activists, such as Bea and Liz, came of in the aftermath of World War II. Their childhoods were marked by ducking under desks as part of "bomb drills" in case the Soviets attacked. Ashtabula was said to be an important target in the event of such an attack due to the plethora of chemical industries around Fields Brook. For members of the Peace Council, protecting the environment

was an extension of the fight for peace: violence against humans was inextricably entangled with violence against the Earth. To accomplish environmental justice, they theorized, one must first end the conditions of suffering and destruction that made environmental degradation possible.

Bea's protest took the form of a march on RMI. In her memoir, she recalled that day:

> "[H]undreds of women, men and children of all persuasions marched to the RMI Extrusion Plant on July 16, 1983 with balloons and banners tied to baby carriages and strollers, bicycles and hands, and called for an end to nuclear arms production and testing. We released black balloons into the heavens bearing the message "Freeze Nuclear Weapons here at RMI and Everywhere." Now the whole county knew the secret and public officials had to talk about it." (93)

One thing that stood out to the trio about that day was the fact that many plant employees came outside to engage with them, separated by the fence:

> "They stood there and shouted at us to go home. I also noticed one man, in the back, who was not saying anything but he was taking pictures."

Years later in 1995, an acquaintance of Bea and Isaac's worked at RMI as an EPA librarian. It was she who discovered what had become of the photos:

> "It was my job to sort through all of the EPA records for the company. One day, while sorting a filing cabinet, I came across a series of photos of the 1983 protests. I quickly realized that I recognized several faces: there were my friends, staring back at me: I saw a younger Bea and Liz, and next to Liz was Isaac, only a

> little boy at the time. The company had printed and kept their photos after nearly a decade. It was the creepiest thing I had ever seen."
>
> - Interview with JI, Erie PA, 7 March 2019

According to Bea, Liz, and Isaac, the protest consisted of about one hundred individuals, most of whom resided in Ashtabula County. According to Liz, there was little publicization or even community acknowledgement that the protests had occurred:

> "You would think something like that would have made the newspaper, that people would have been up in arms. But it came and went, and nobody other than us and maybe some of the workers who were there even thought about it after."

Despite this fact, they all agreed that the protests had been a formative part of their lives. Isaac, who had only been a little boy at the time, claimed that the protests and Bea's titanic mentorship had crafted him into "the environmentalist I am today." Bea framed her leadership in organizing the protests from a position of moral authority, achieved by her age and her global experiences:

> "The weapons produced by RMI from depleted uranium were weapons of war. I was a former United Nations peacekeeper and made several trips to the Yugoslavia… Their people for years have experienced the adverse health effects from exposure to the very same uranium bullets RMI produced. Peace and the

> environment… they're connected. Some of the most horrific things about war are the environmental tolls it extracts."

Near the end of our meeting, Bea revealed another shocking life experience that served to bolster her moral authority. When I turned my back, Bea observed the Ruth Benedict quote on the back, and asked me to recite it to her. Feeling compelled to share, I also told her about another famous quote: Margaret Mead's dictum, "Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has." Upon revealing the source of the quote, Bea responded:

> "I knew Margaret Mead. It was at the University of Chicago, sometime in the late 1950s. I was a graduate student, and Mead had organized a meeting of campus activists who were concerned about the U.S. government's dumping of nuclear waste in the Marshall Islands."

This information amazed me, but it also grounded me with a profound awareness of the true seriousness of RMI's activities. The nuclear age had been thrust upon the world violently and suddenly, with little regard for the consequences of its proliferation. Bea Silverberg's global activism spanned prominent, globally known places and incidents: the Slavic wars, the decline of West Virginia's coal mines, waste disposal in the Marshall Islands. To think that Ashtabula had attracted the activism of someone of Bea's stature reinforced the notion that I was doing important work.

Voyage of the Beluga

In 1985, in response to the ongoing public outcry of concerns about suspected cancer clusters near Fields Brook, especially by APAC and APC, the Ohio Department of Health announced that it would conduct a public health assessment of cancer risks near the Superfund Site. Ashtabula residents like Silverberg, Zalimeni, Coblentz, and others all expressed the shared cognitive dissonance surrounding this announcement. They all knew that this could be make-or-break: a shared feeling of hopefulness was met with an equally, if not more, pervasive suspicion that the scales of justice were tilted against them.

In 1987, ODH held a public meeting to announce the results of its study and published them online. Those who had been suspicious about the study felt their worst fears had been confirmed. Although ODH did find a higher-than-expected incidence of cancers in the area, they determined that there was insufficient evidence that contamination of Fields Brook was linked to the clusters (Indian and Hundley 1987). Among the compounding factors, they claimed, were the relatively low socioeconomic status of the residents (thus presumed to have unhealthy lifestyles), the small sample size of the population, and the genetic homogeneity of the population, who were mostly the descendants of families from similar regions of Sweden and Italy. The announcement that no causal link could be established provoked sharp and sustained public outcry. One informant described the mood of the meeting:

> "Everybody was stunned. Here was the Department of Health basically telling us, 'Yes this stuff causes cancer, and yes you have a lot of cancer, but also no it didn't cause it, you caused it yourselves.' And that was confusing and I think

shocking and hurtful to people. It was basically like the government was telling us to ignore reality."

- Interview with MH, Ashtabula OH, Dec 28 2018

In one interview with a medical doctor, I learned that simple geography could be a reason why cancer prevalence data in Ashtabula is so thin:

"Ashtabula is rural, and so we don't really have a major hospital here that can treat people with cancer, especially the more aggressive types. And so what happens is all of those people go to either Cleveland, Erie, or in some cases Geauga for treatment. Their patient data is recorded there, and there is no cross-referencing database that can track patients from one residential location across all of them. It would require some serious sleuthing to pull that information together.

- Interview with Dr. Catlady, Conneaut OH, Dec 13 2018

Eventually the wider concerns about Fields Brook attracted the attention of international environmental advocacy group Greenpeace. In 1988, Greenpeace was traveling aboard the *Beluga* throughout the Great Lakes region to bring awareness to ongoing water pollution issues. Having heard about the protests initiated by Zalimeni and Silverberg, Greenpeace contacted several of the key players involved in the efforts. Fearing an association with so-called "radicals," Zalimeni and APAC sat the protests out, but other locals directly engaged with the

Greenpeace activists. Greenpeace activists met directly with Zalimeni only once, but they also met with a wider network of concerned citizens.

In June 1988, Greenpeace's ship the *Beluga* sailed into Ashtabula's harbor and docked. The Greenpeace activists deboarded and swiftly acted. Using information provided by the locals with whom they communicated, they planted a black flag with a skull-and-crossbones in the yards of 43 homes where a resident had died of cancer surrounding Fields Brook. The activists then made their way over to State Road, where they donned hazmat suits and waded into Fields Brook. They placed a large Greenpeace sign over the drainpipe that flowed from the chemical plants into the Brook and refused to leave. This blockage immediately caused problems at RMI, where a hydraulic press relied on water flow to operate, creating a backup of waste at the plant. Police were called and went to the site of the protest, but were unable to enter the water themselves due to the lack of protective gear—a fact that Greenpeace had planned to illustrate how highly toxic the water was. Without hazmat suits of their own, police could not safely retrieve the activists or unblock the pipe, which halted RMI's operations for hours. Eventually several environmental lawyers appeared and convinced the activists to unblock the pipe and turn themselves in. Police arrested two Greenpeace activists, but all formal charges were eventually dropped.

Local activist William "Red" Leonard was one of the people with whom Greenpeace had corresponded, and he was present on the day of the protest as photographer. Red took several photographs aboard the *Beluga* of the activists, as well as photographs of the protest. Some of the images are shown below. Although Red died in 2015, his daughter and brother were gracious enough to donate the photographs. When asked about the impact of seeing her Dad involved with such a prominent protest as a young girl, his daughter had this to say:

> "My Dad was always very vocal. He was the kind of person who would write letters to make people aware of different problems in the community… Even though I was still kind of young when the protests occurred, I knew it was a really big deal that this international group was paying attention to Ashtabula. And I looked up to my Dad so much, and I thought it was so cool that he was a part of this truly historic thing."
>
> - Interview with JL, Ashtabula OH, March 10 2019

The Greenpeace protests undoubtedly served as a turning point in the environmental consciousness of Ashtabulans. No longer was it possible to pretend the cat was not out of the bag. With a full decade of sustained attention on Fields Brook, an entire generation of locals had come of age hearing the horrors of Ashtabula's nuclearization at RMI. The headliner appeal of a protest by a prominent organization such as Greenpeace undoubtedly served to legitimate the risks Ashtabula residents faced in the eyes of many outsiders. However, even as community concerns grew, there were still more than a vocal few who were outspokenly defensive of RMI, including both current and former plant workers. The Greenpeace protests, coming at the tail end of the first great wave of neoliberalism, called the nature of trust and risk into question. They served as the culminating event that capped off nearly a decade of protests over RMI and were perceived by some to have been the tipping point that finally drew a sustained response from corporations and governments.

Figure 5.2: Greenpeace protest at Fields Brook, Ashtabula OH, 1988. Photo album by Red Leonard.

Truth, Risk, and Activism in the Nuclear Age

At issue here is a fundamental question about the nature of chemical exposure: who gets to decide which version of the world gets to be known as "truth," and how do people struggle for this right? Foucault (2008) has referred to biopower as "power over life," and thus, by extension, the *right to choose who lives and dies.* In this case, the right to life is a war waged over fault lines of experience, measurability, and probability.

The chemosociality of uranium founded upon truth and legitimation. For decades, RMI and the federal government both denied the use of radioactive materials. This was consequential for many reasons because it exposed countless people to possible uranium contamination on an

ongoing basis in various settings without their knowledge or consent. For instance, RMI used to sell scrap metal to ACME just down the street, who would burn or bury the scrap metals. As it turns out, some of those metals were contaminated with uranium, furthering the spread of contamination.

Second, one must recognize the crucial role of expertise and deciding in controlling the overall experience. The uncertainty of uranium contamination spread fear and confusion through Ashtabula society. Many residents were unsure who or what to believe. This must also be placed in context of the increasingly neoliberal U.S. manufacturing economy of the 1980s. Residents watched their loved ones die of cancer, unsure about the cause and feeling both shame and confusion when the Health Department seemingly pointed the finger back at them. The lived experience of uranium contamination produced profound anxiety, ushering in a sense of risk society (Beck 1986) for Ashtabula residents.

Finally, one sees cultural activism at work in response to the uranium facility. Protest events were significant historical moments that shaped public perception as well as forced corporate engagement with the problem. The increasingly large events attracted more prominent names who lent cultural capital to help legitimate the movement for environmental justice at Fields Brook. Different activists approached the problem with different agendas: APAC was narrowly focused on nuclear pollution and the possible link to cancer; APC drew on discursive links between environmental and anti-war movements; and Greenpeace introduced concerns about multispecies relations and the impacts of the pollution on non-humans, too. The participation of some residents in these events indicates that the threat of nuclear contamination—something tangible, as they had been a generation who grew up after WWII—was so visceral that it prompted otherwise mild-mannered people to speak out. Each activist

group shared a vision of a future where nuclear war would not threaten the people of Ashtabula, if for slightly different reasons.

Conclusion: Depleted Agents

This chapter will undoubtedly make a lot of people very angry. Based on the information I have uncovered, it is no wonder why RMI's retired plant managers would refuse to talk to me. People who had lived through the contamination affirmed this, with a refrain I again heard over and over: "RMI was the worst polluter of Fields Brook." Its relationship with the community was built on a flimsy foundation of secrecy, mistrust, and constant pressure. The so-called "chilling effect" for which RMI was cited by the NRC appears to be a fundamental part of RMI's culture that has always been there and continues to this day.

The novelty of nuclearization—we had only been doing it a couple of decades, after all—combined with its perceived threat and association with warfare played a major role in shaping public perception about RMI's role in the contamination of Fields Brook. Although eighteen other industries also participated in toxifying Fields Brook's waterscape, none received the outsized attention and scrutiny given to RMI. The protests are significant for this reason: no other specific industries or contaminants drew large scale, public demonstrations the way RMI did.

Critically, the role of the U.S. Department of Energy in the apparent cover-up soured many residents' perceptions of government. In a Democrat dominated union town, this was a meaningful shift. After trusting government's efforts to mitigate pollution and regulate worker safety, residents felt burned by the apparent double-speak of a government who had been poisoning them with radiation for years.

Uranium's chemosociality at once evokes the perpetual entanglements of warfare, the horrors of dramatic cancers and deformities, the outrage of big government secrecy, and the ever-rising pressures of modernization. Geiger counters turn workers into cyborgs (Haraway 1991a), who become known through measurability achievable only using an electronic device from which the worker is alienated. Although uranium is not materially a predominant component of Fields Brook Superfund Site's assemblage, it holds outsize importance as a locus of immaterial risks, fears, and obligations to either be silent or speak out. It is one of the most toxic non-synthetic elements due to its tendency to decay, released free radicals—also known as atomic subparticles—that infiltrate, reconfigure, and eventually conflate organismal biologies. Its status in the cultural imaginary as a purveyor of zombie-like biological horrors evoked a more intense and rapid reaction than some of the other chemicals, whose deleterious effects became fully known over longer spans of time. This ominous perception imbued uranium with urgency. Human cultural reactions elicit a similarly volatile response, creating clusters of activism and outspokenness by fearful residents. Uranium comes to be known because of the incredibly risky conditions for life it provides. Such a risk was deemed unacceptable to many in Ashtabula. Through these acts, uranium comes to be known as an important perceived part of the Superfund Site.

"THE EARTH IS NOT SLEEPING, SHE IS VIOLATED AND FURIOUS."

- Meridel Le Sueur

As J and I concluded our interview, J handed me the papers she had promised. "If you look there," she said, "you can see the different measures of radioactive isotopes and

different things I was exposed to while I worked at RMI." The regular assessments by occupational medicine specialists were a mandatory part of renewing annual health insurance for all RMI employees both current and former.

"Thank you so much for this," I responded.

"No it's the least I can do. You have more use for them now than I."

J and I paused as I read over the documents. It was a cold day in March. Jane was once the librarian for government records housed at RMI, but now worked at a regional university in northern Pennsylvania. The students were technically on spring break, but it was hardly so with nearly a foot of snow on the ground and temperatures hovering in the mid-20s. After a few moments of silence, she spoke again.

"You know, this might sound strange, but I knew someone with your name once. He came here, and I interviewed him years ago. At first, when Isaac said your name, I thought you were him. Do you have family in this area?"

"Yes," I responded. "My Dad grew up around here. I think you might be talking about my Grandpa. I'm named after him. But no, he wouldn't be the one contacting you. He died last May."

"I'm sorry to hear that….

Another moment of silence passed.

"The reason I ask is because… I actually interviewed him once, for an oral history project on industry in town… I have the interviews still. Would you like me to send it to you? You can hear your Grandfather's voice again."

"Yes, please. I would love that."

Later that night, after I had returned to my host family's home, I sat down to type up my field notes for the day. As I was working, I heard the familiar "ding!" of my email. I checked and saw that J had attached the audio of the interview.

I paused my notes, feeling a need to take a break anyway and clear my head from all of the heavy information I had received over the last few days. My interviews with Bea and J took place just a few days apart, and I was still processing all of this new information. I plugged in my headphones, and opened the file. The first voice I heard was Jane's.

"Can you please state your name, place of birth, and date of birth?"

My grandfather replied, much more steadily and swiftly than I remembered him in his later years.

I sunk my back into the chair, closed my eyes, and leaned my head back as I listened to my Grandpa retell the story of his own work at a chemical manufacturing plant, and I allowed myself to fall into the emotional abyss of everything I had learned the last few days. For decades, the bodies of me and my ancestors had been filled with chemicals—including ones I had not known about until just a few days before. As I drifted off to sleep in the armchair of my best friend's living room, I listened to my Grandfather's low, growling voice and thought about the reproductions of class, race, and gender my own lineage embodied. I, a child of Rust Belt factory workers, had walked out of the ruins of deindustrialization, only to reenter in the hopes of performing a social autopsy.

Chapter Six: Better Living Through Chemistry

Introduction: Household Names

"It will take a massive effort to move society from corporate domination, in which industry's rights to pollute and damage health and the environment supersede the public's right to live, work, and play in safety. This is a political fight. The science is already there, showing that people's health is at risk. To win, we will need to keep building the movement, networking with one another, planning, strategizing, and moving forward. Our children's futures, and those of their unborn children, are at stake."

- Lois Gibbs

In 1976, news came out of northern New York that shocked the United States. Schoolchildren in a white working class neighborhood in Niagara Falls were experiencing strange illnesses. The cancer rate had shot up, and the number of mothers who gave birth to stillborn or deformed infants was skyrocketing. Reporters in the *Niagara Falls Gazette* claimed that the illnesses could be linked to chlorinated hydrocarbons present in the water. A local woman named Lois Gibbs went door to door, riling her community and inciting one of the earliest examples of environmental justice activism in the United States. Over the next two years, it was revealed that the entire neighborhood had been constructed over a landfill containing chemical wastes disposed improperly by Hooker Chemical Company. The incident was a national catalyst for the passage of Superfund legislation (Layzer 2012).

The Love Canal story is a landmark episode in the history of U.S. environmental justice. It demonstrated the power of citizens to call attention to contamination and enact change at the federal level. It also represented a turning point in the operations of industry and shifted the fundamental calculus of environmental economics to include risky externalities. What is often forgotten, however, is that Hooker Chemical Company—now known as Occidental, or OxyChem—was not just dumping into the Love Canal. Their operations expanded far out of New York, to Ashtabula, where the subsidiary company Detrex was dumping chlorinated solvents and hydrocarbons into Fields Brook.

Why is Love Canal a national household name, while Fields Brook barely registers in the historical memory of even Ashtabula's own residents? When I first pored over the thousands of public records available in the EPA's online database, I found myself wondering this question intensely as a symbol for the "forgotten people" of Ashtabula. The simple, if unsatisfying, answer to this question, I think, is that the anti-nuclear activism discussed in the previous chapter provided a more pressing cause for activism and thus preoccupied much of the attention around Fields Brook. But just as RMI worked to hide their dirty deeds, so too did companies like Detrex seek to minimize their own liabilities. When I contacted the current Vice President of Detrex to inquire for my research, I was told verbatim: "We want nothing to do with your project."

This chapter explores the legacy of chlorine contamination of Fields Brook from multiple sources. Besides Detrex, which produced a number of chlorinated compounds, many of the other facilities surrounding Fields Brook also utilized chlorinated compounds that eventually ended up in water and soil. One important site was Acme Scrap Metals, where a feverous pursuit of valuable metals led to indiscriminate spills of chlorinated compounds. Chlorinated compounds are thus a cradle-to-grave affair, signifying the contamination potential of chlorine across the life

cycle. Chlorination is a manufacturing process that can be applied to all sorts of different compounds to achieve desired chemicals. The chapter therefore focuses on chlorine broadly as a periodic element, dividing sections of the chapter to address relevant specific chlorinated compounds. Drawing on Becky Mansfield's (2018) analysis of Anthropocene bodies, I argue that a feature of postindustrial Ashtabula's culture is the anxiety and uncertainty that comes with accepting the permeability of one's body to various chemicals.

Chemical Profile: Chlorine

Chlorine is a highly reactive halogen, or salt-producing element. It appears as a yellow-green gas at room temperature. Chlorine's atomic number, 17, indicates 17 electrons. In ionic chemistry, electrons around an atomic nucleus are observe in three magnetic layers known as "shells." The first shell of any element can contain up to two electrons, while the second and third shells each contain up to eight. The elements that are most reactive in nature are those that only require one additional electron to fill their outermost shell. Chlorine is such an element. It is therefore able and willing to react with a variety of other elements to achieve stability (American Chemistry Council 2020).

Chlorine's high reactivity affords it special chemical status. This reactivity enables it to act as an inorganic solvent, binding quickly to other compounds and altering their structure. As such, chlorine is popular as a sanitizer: some examples of its applications include household cleaners, water purifiers, pesticides, and industrial solvents. However, the same properties that make it useful also make chlorine highly dangerous. It reacts quickly and violently with organic matter. Chlorine exposure can cause severe damage to the eyes, nose, and respiratory tract (ATSDR 2010).

At Fields Brook Superfund Site, Detrex Chemicals, a subsidiary of Hooker Chemical Company, is a leading worldwide manufacturer in hydrochloric acid. Olin Corporation, which once had a plant along Fields Brook, was also a manufacturer of chlorinated products. Other industries including RMI, which split sodium and chlorine from mined salts, and AshtaChemicals, which extracted and purified raw chlorine gas, were involved in the chlorine supply chain. The following list of chlorinated chemicals were identified by the U.S. EPA as "contaminants of concern" in Fields Brook. Information about each chemical was obtained from the National Center for Biotechnology Information's PubChem database (NCBI 2020). X's in all chemical formulae indicate the number of atoms may vary:

- Chloroethane ($CH_3CH_2Cl_x$): Commonly known as ethyl chloride, this colorless, flammable gas has a distinct sickeningly sweet odor reminiscent of cat urine. Chloroethane is a by-product of polyvinyl chloride (PVC) pipe production, which took place at Olin. It is a common thickening agent in materials such as paint and gasoline.
- Chlorobenzenes ($C_6H_5Cl_x$): Chlorobenzenes are colorless, odorless liquids. They are an intermediary used in the production of numerous other industrial products, such as rubber for tires and pesticies/herbicides.
- Chloroethenes ($C_2H_3Cl_x$): Commonly known as vinyl chloride, this colorless, flammable gas also smells sickeningly sweet. It is an intermediary in the production of PVC plastic. Chloroethenes are highly toxic. Importantly, they can also be formed in the environment when chlorinated solvents atomically decompose, meaning that these highly dangerous chemical can form even outside the controlled setting of a laboratory or factory if such solvents are improperly disposed of.

- Chlorophenol (C_6H_5ClO, Di: $C_6H_4Cl_2O$, Tri: $C_6H_2Cl_3OH$): Chlorophenols are hydrocarbons that share an electronic shell with one or more chlorine atoms. They typically occur as solids, appearing salt-like in structure to the naked eye but lacking the crystalline lattice typical of such compounds. Depending on the number of chlorine atoms, the molecular structure of chlorophenols ranges slightly. They have a wide range of applications including medicine, pesticides and herbicides, and household and industrial disinfectants.
- Chloroform ($CHCl_3$): Chloroform is a colorless, sweet-smelling liquid produced as an intermediary for the manufacture of polytetrafluroethylene (PTFE), a non-stick metallic coating conventionally known as "Teflon." Chloroform is also widely used as an industrial solvent and anesthetic. Organisms exposed to chloroform are often overwhelmed and may be knocked unconscious, leading to its widespread use by criminals in the mid-twentieth century.
- Heptachlor ($C_{10}H_5Cl_7$): Heptachlor is a common insecticide. It has historically been widely available for use by industry and the general public alike. Heptachlor was one of the main chemicals Rachel Carson wrote about in her landmark book *Silent Spring*.
- Hexachlorobutadiene (C_4Cl_6): Hexachlorobutadiene is a colorless liquid with a smell similar to turpentine, or pine wood. Its main use is as an industrial solvent for other chlorinated compounds.
- Polychlorinated Biphenyls ($C_{12}H_{10-x}Cl_x$): Known commonly as PCBs, these compounds are dense, oily yellow liquids. They are hydrophobic, meaning they do not distill in water. PCBs are readily absorbed by a number of other compounds, including skin and hair, PVC, and latex. Because of this absorption and high reactivity, they are incredibly

> dangerous. Different PCBs have been linked to a wide variety of human health concerns. The U.S. has banned the use and manufacture of PCBs since 1978; however, their longevity means that many are still present in soil and sediment throughout the world. It is estimated that every single living organism on the planet has been exposed to PCBs by the time they are one year old.

Because of the complex nature of the financial settlements surrounding Fields Brook's cleanup, it is not possible to trace historical records for a complete list of which compounds may be attributed to specific PRPs. Although I did manage to speak with some people who worked at the companies like Detrex, Olin, and Diamond Shamrock that worked with chlorinated solvents, most of these folks were older and lacked formal education beyond sometimes even a junior high level. They were able to describe some of the features of the chemicals they remembered, but in most cases could not recall specific compound names. PCBs are one exception: PCBs were not directly manufactured at any of the Fields Brook facilities, but they were utilized at many for different purposes.

The ethnographic portion of this chapter presents two versions of chlorination which Ashtabulans recognize: conspicuous versus inconspicuous. Conspicuous chlorination is largely the product of chlorinated solvents and acids produced by Detrex. These chemosocialities are best recognized as sensorialities (Nichter 2008). Inconspicuous chlorination mainly comes from PCBs, which were deposited into Fields Brook by multiple PRPs. While these cannot be directly sensed, they can be interpreted as a form of risk-based perception. The pervasive smells and pains associated with chlorination deliver a foreboding sense of risk society to many living in Ashtabula.

"What's that smell?": Conspicuous Chlorination as a Way of Life

Without question, chlorinated compounds are the first thing any Ashtabula resident notices about the Fields Brook industrial complex. The reason is simple: the odor. Chlorine's distinctively sweet odor escapes the confines of factories to this day, resulting in a lingering smell in the air. At times it is worse than others. Detrex has been the subject of multiple lawsuits and settlements concerning complaints about excessive odors. The most recent, in 2014, occurred when there was a persistently strong odor as some of the fumes from its HCl production line escaped downwind, lingering over Ashtabula Township's residential suburbs for several days. Residents later received mailers informing them of their entitlement to a small sum as settlement for the foul odor. The conspicuous chlorination of Fields Brook is an ongoing feature of the site.

Hooker Chemical company constructed and opened the Detrex plant in 1946. Detrex is a subsidiary company of the former Hooker Chemical Company—now Occidental Chemical Company, or OxyChem. Hooker was the principal manager of the facility until 1956, when Detrex assumed operational management. The facility is located on State Road about one tenth of a mile from the Middle Road intersection. It sits on the north side of Fields Brook, with Ineos Pigments Plant 2 located on the south side of the brook. Because Detrex is located directly along Fields Brook, it is a prominent cultural landmark that signals industrial pollution to locals. Other facilities in the industrial complex utilized chlorine for various processes, giving Detrex an important role in the broader supply chain of Ashtabula industries.

In addition to producing raw chlorine, Detrex also produced a variety of other chlorinated chemicals such as chlorophenol and trichloroethylene which were later identified as hazardous contaminants in Fields Brook (Thomas 1955). Today, the facility is narrowly focused on the

product of hydrochloric acid (HCl). The longstanding historical connection to Hooker Chemical Company and Love Canal, however, is not lost on older residents, especially those whose family members worked at Detrex.

Because much of the illegal dumping at Detrex took place in the mid-twentieth century, it was nearly impossible to locate firsthand sources who either witnessed or participated in contamination themselves. Informants who were alive at that time provided anecdotes of encountering chlorine pollution, which I will discuss in detail in the next section. I did manage to locate one informant who worked at Detrex over several summers:

> "As a child my dad was one of the people in charge at Hooker/ Detrex chemical and we played in Fields Brook when he would get called in on weekends. Later in life I was with a congressional investigative group alongside the EPA as it removed samples from the waters. This part is un-documented: while probing the water with about 2-inch round pipe tubes to attain core samples of the riverbed we broke thru to another water flow underneath. In this lower sample it was determined after testing to contain at least three elements not before discovered. You will not find this in any documentation, but I believe it was a determining factor in why Fields Brook was declared a Superfund site... By the way, I am not saying this was a cause or am looking to sue anybody, but I have been fighting a rare cancer for twelve years and yesterday was told I have another completely unrelated cancer. This one is so rare only 243 cases have been reported worldwide."
>
> - RD, Facebook Message, 2 February 2019

I was struck by a few aspects of this conversations. I realized that I was speaking to someone who had played in Fields Brook just downstream from its industrial contamination and who now, maybe, was suffering the consequences of his childhood romps. Moreover, if what he said was true—that there had been undocumented chemical analyses of the site—this would indicate that Detrex, like RMI, had gone to great lengths to prevent the public from knowing the full extent of their industrial contamination.

One reason why Fields Brook may not have attracted the same amount of attention as Love Canal could be the lack of a big-name company attached to the narrative. Detrex's status as a subsidiary meant that Hooker itself was one step removed from the process. It was only through Detrex's efforts to ensure cost-sharing liability through CERCLA that Hooker was even designated as a PRP. Love Canal was a landmark environmental justice case, propelled forward by the actions of local journalists and one outspoken single mother. In Ashtabula, attitudes toward industry were more accommodating, which meant that contamination of Fields Brook would not be addressed until a full decade after Love Canal made national headlines. The subsidiary status of Detrex meant that Fields Brook remained a local issue, removed from national environmental consciousness. Willow (forthcoming) has pointed out these disparities in analyzing why some people become activists while others do not, finding that communities with historically entrenched extractivism economies tend to be less responsive than communities seemingly experiencing industrial pollution as a novelty.

Conspicuous chlorination is the pollution people see, taste, smell, and recognize. Because of chlorine's aromatic potency, it holds representational significance in the minds of Ashtabula residents. For many who do not work at the plants, the area is most recognizable for the smells

put out by chlorine facilities. In the present day, this is a market predominately occupied by Detrex. Reflecting on the anecdotes I described in chapters two and three, many of the descriptions indicated that my informants were witnessing the effects of chlorinated contaminants. This was more readily observable, and therefore understandable, than contamination by uranium.

PCB Graveyards: Inconspicuous Chlorination and World Risk Society

There is another, less visible source of chlorine contamination at Fields Brook. Polychlorinated biphenyls, or PCBs, are waxy compounds that efficiently insulate, cool, and lubricate electrochemical energy. Because of this, they were widely manufactured by Monsanto for use in electrical equipment. PCBs are permeable to skin and tend to accumulate in fat. Long-term health risks became widely known throughout the environmental awakening of the 60s and 70s. PCBs were banned in 1979 and are no longer legal to manufacture in the United States (EPA 2019).

Before their ban, PCBs were widely utilized in various industries at Fields Brook. For example, at the $TiCl_4$ plant, also known as Plant 2, PCBs were used as part of the thermal process that enabled the production of titanium dioxide pigment. One of the most significant contributors to PCB contamination at Fields Brook was Acme Scrap Metal. Acme accepted scrap metals from a variety of sources, including other industries at Fields Brook. Cleveland Electric Illuminating Company, or CEI, disposed of electrical transformers at Acme. And even RMI was found responsible for disposing of uranium-contaminated metals at Acme without disclosing that fact.

On March 1 2019, while traveling between Tampa and Ashtabula, I met for a late evening coffee with a man named John, who I connected with via the Growing Up in Ashtabula Facebook group. John had worked at Acme Scrap Iron & Metal in the 1970s and was willing to talk about his experiences there. We met at a Denny's in Rock Hill, South Carolina where he lives. Exhausted from nearly eleven hours of driving, I nonetheless pushed through the meeting. When I met John, I immediately noticed that he walked with a cane, and seemed to be short of breath. He was overweight, but not unusually so; his heavy breathing was an immediate sign of respiratory problems. Early during our conversation, he identified his former work at Acme as a possible cause:

> "When I worked at Acme, we collected electrical transformers. We had to cut them open to get to the wires, and during that process we spilled PCBs on the ground. Sometimes the oil was up to my ankles. And we would throw the wires, coated in PCBs, into a pile and light them on fire to strip the copper for scraps. We did this in the middle of the warehouse, with no ventilation and no masks. I remember my lungs would burn, but you just got through it in those days."

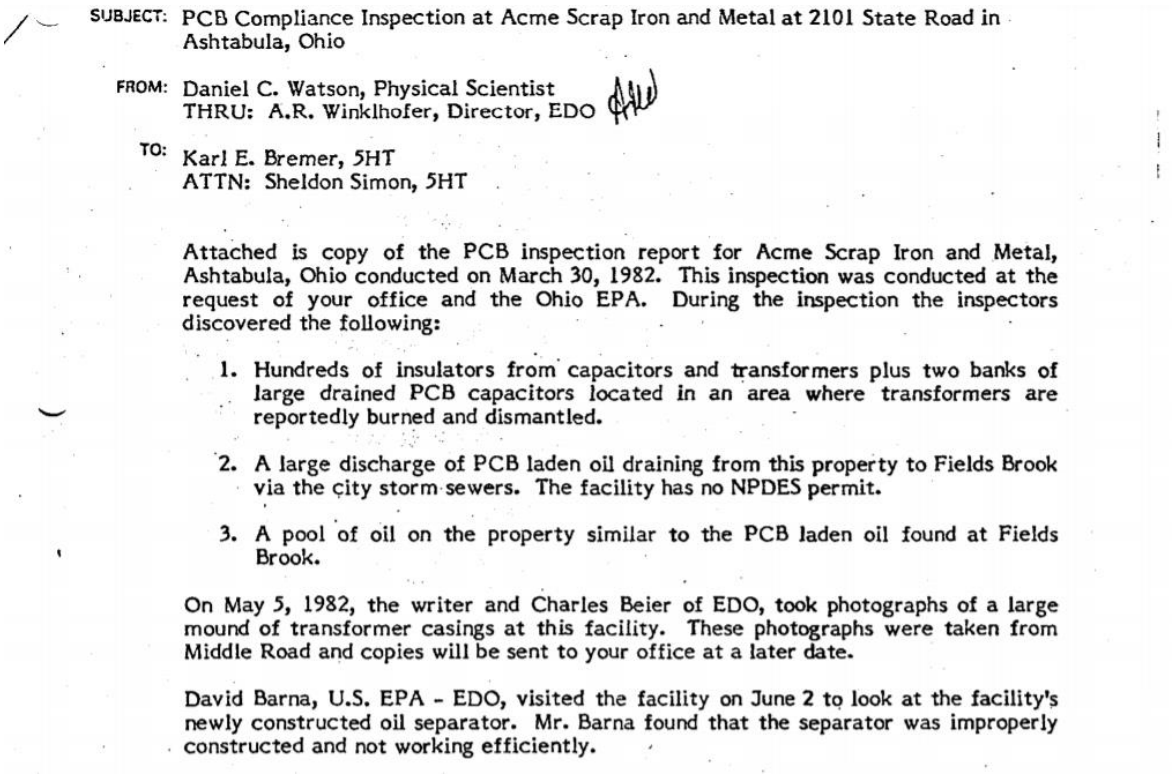
Court and EPA records support John's claims. In 1974, the State of Ohio sued Acme for violating air quality standards through their open burning practices (*State of Ohio v. Acme Scrap Iron & Metal* 1974). Electrochemical bonfires were conducted both indoors and outdoors, resulting in the release of incinerated pollutants into the open air. Decades after his work at Acme, I could see and hear the toll this work had taken on John. John described, vividly and horrifically, his present symptoms:

> "I went to the doctor because I was having trouble breathing, and I started coughing up black stuff… I thought I might have cancer. So I went to the doctor, and he says to me, 'John, you have black lung disease. How long did you work in a coal mine?' I just looked at him, perplexed, and I said I never worked in one. Then he asks me if I've smoked, and I told him I'd never smoked a cigarette in my life. The doctor looked at me as if I had grown a third head. He said it's the first time he'd ever seen black lung in someone who didn't work in a mine."

After receiving his diagnosis, John contemplated his options. He told me that he contacted a lawyer who works on workers' health claims, but was told that his case would be unlikely to succeed:

> "I talked to a lawyer who has worked on this type of stuff, and he told me that it probably wouldn't work. He said that the company would claim that there was no proof, especially since the biggest problems appeared years later."

Acme, like other Fields Brook defendants, faced financial pressure from a combination of regulations, fines, and lawsuits throughout the 70s and 80s. According to John, the lawyer's assessment was probably correct, as he did not perceive the company he had known and worked for to be one to do the right thing. John gave a shocking example of Acme's desire to avoid litigation:



SUBJECT: PCB Compliance Inspection at Acme Scrap Iron and Metal at 2101 State Road in Ashtabula, Ohio

FROM: Daniel C. Watson, Physical Scientist
THRU: A.R. Winklhofer, Director, EDO

TO: Karl E. Bremer, 5HT
ATTN: Sheldon Simon, 5HT

Attached is copy of the PCB inspection report for Acme Scrap Iron and Metal, Ashtabula, Ohio conducted on March 30, 1982. This inspection was conducted at the request of your office and the Ohio EPA. During the inspection the inspectors discovered the following:

1. Hundreds of insulators from capacitors and transformers plus two banks of large drained PCB capacitors located in an area where transformers are reportedly burned and dismantled.
2. A large discharge of PCB laden oil draining from this property to Fields Brook via the city storm sewers. The facility has no NPDES permit.
3. A pool of oil on the property similar to the PCB laden oil found at Fields Brook.

On May 5, 1982, the writer and Charles Beier of EDO, took photographs of a large mound of transformer casings at this facility. These photographs were taken from Middle Road and copies will be sent to your office at a later date.

David Barna, U.S. EPA - EDO, visited the facility on June 2 to look at the facility's newly constructed oil separator. Mr. Barna found that the separator was improperly constructed and not working efficiently.

Figure 6.1: Photocopy of PCB compliance inspection communication (U.S. EPA 1982).

> "Over the years EPA got tougher and tougher, fining Acme for everything. So they started having us go out back and bury some of the scrap materials we received, especially stuff that had PCBs. If you go out behind the old Acme building and start digging, you'll find a PCB graveyard out there. And they did it to avoid EPA regulations, to make sure they were not aware of how much dirty scrap metal we were really dealing with."

PCB contamination was closely tied to illegal burying and dumping around Fields Brook. CEI also maintained a coal pile along the brook at one point, and was accused of dumping coal tar and other wastes into the water. Several facilities including Cabot, Detrex, and Diamond

Shamrock manufactured or processed PCBs. The widespread distribution of PCBs and their ability to remain in soil and sediment for long periods of time lead one to conclude that their contamination is ongoing. Indeed, the U.S. EPA has indicated that PCB contamination is widespread throughout the globe, and that every single living organism born since their use became widespread is exposed within a year of life. PCB contamination is extraordinarily difficult to assess for this reason. To make matters worse, there are hundreds of different kinds of PCBs, each with its own distinct chemical formula. Although they generally appear the same—a waxy, yellowish substance—different configurations have different kinds of bodily permeability. They enter bodies and interact with them in multifarious ways depending on both the form they take and the pathway of entry. This makes PCBs highly unpredictable and indeterminate. Nash (2006) calls these risk pathways "inescapable ecologies," and their foreboding sense of inevitability makes them a profound agent in shaping local risk perception.

Anthropologists who have written about the spread of inconspicuous contamination such as vapor or fluid intrusion—sometimes called "plumes"—note its connection with circulations of capital and media associated with globalized environmental management (Little 2013; Willow & Wylie 2014; Willow 2015; Wylie 2018). Conspicuous contamination dominates the imagined lives of exposed residents, but inconspicuous contaminants often do the most harm. Yet they are the hardest to identify. In outlining the process of risk assessment, Checker (2007, 114-115) notes the flexibility and inherent bias present in sciences imagined by many to be concrete, definitive, and absolute.

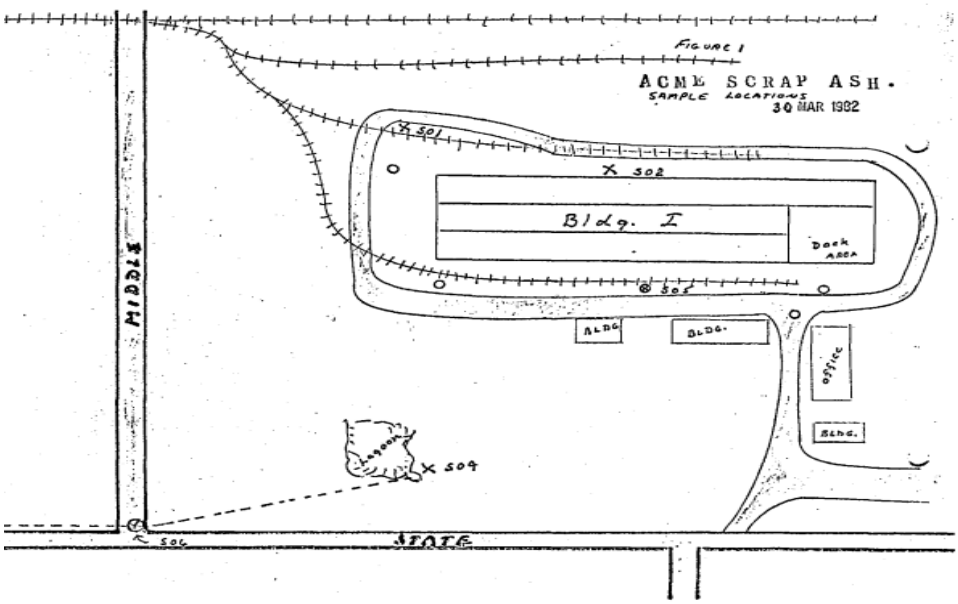


Figure 6.2: Point source contaminant diagram of Acme Scrap Iron & Metal. (U.S. EPA 1982)

In documenting the prevalence of inconspicuous chlorine contamination at Fields Brook, the Ohio EPA and U.S. EPA established a partnership to identify and characterize hazardous chemicals, assess exposure pathways, and characterize the risks. In some cases, the PRPs readily admitted to at least some of their deeds. In others, scientists and public health professionals had to go to various lengths to establish proof of contamination. For some such as CEI, photographic evidence of coal piles and other contamination existed. Other companies had internal parties who acted as whistleblowers. In some cases, the companies even acted as whistleblowers against each other, such as when Detrex provided evidence of Hooker Chemical Company's liability to the Superfund. For Acme, some of the most incriminating evidence came from water and soil assessments. A PCB compliance assessment completed in 1982 provided proof that Acme had failed to contain the PCBs spilled on site. Soil and water tests confirmed that PCBs found in Fields Brook downstream from Acme matched those spilled

at the site. As further evidence, EPA scientists injected a non-toxic dye into the water to observe the pathway in real time. Within minutes of injecting the dye upstream where it entered Acme's property, it arrived downstream at the exit point of the sewer at Fields Brook. This demonstrated that the natural waterflow was consistent with the hypothesis that PCBs had traveled downstream. Figure 6.2 above shows how EPA scientists evaluated the point source contamination stemming from Acme's unpermitted wastewater lagoon.

The availability of various environmental and health assessments through public databases such as this demonstrate what Haraway (1991a) has called the "proliferation of cyborgs". Ashtabula citizens and workers live and die by data recorded by machines. It has been well-documented that many of the populations who are most affected by contamination lack the literacy and technology skills necessary to access or understand it (Checker 2005). Indeed, this was also my experience: most of my informants had no idea this information was publicly available. When I showed it to them, many felt confused, and began asking questions I frequently could not answer. The pervasive inundation of information—what Lochlann Jain (2013, 27) has called the "firing squad of statistics"—compels fear and mistrust, feeding the risk society.

Chlorinated Bodies: Indeterminate Health Risks

A crucial part of chlorine's contamination legacy at Fields Brook is the range of alarming health concerns that, to many residents, are a sure sign of the decades-long poisoning of air, soil, and water. In the previous chapter, I briefly discussed an ODH study completed on cancer prevalence downstream from Fields Brook. The study was partly in response to growing concerns about radioactive contamination from RMI. When the study found no statistically

significant evidence of causality between contamination and cancer rates, residents were dumbfounded and outraged.

Thirty years later, I find myself wondering if part of the problem, too, was that activists did not perceive chlorination as a significant threat. Surely, radionuclides are a threat to human health. But were they the biggest threat Fields Brook had to offer? After all, EPA scientists had found lower concentrations of radionuclides in the soil and sediment such that, in most sampling locations, the thresholds were too low to be deemed hazardous for human health without direct ingestion. Concentrations of chlorinated chemicals, on the other hand, were much higher and more widespread. Chlorine is much more reactive, too: it binds to soil and organic matter, sets off chain reactions that create new compound in the environment, and escapes its containment boundaries easily to vaporize into the open air or water.

Of course, cancer is not the only imaginable condition that may arise from industrial contamination. The U.S. EPA and CDC have identified a wide range of adverse impacts of the chlorinated contaminants of concern at Fields Brook. Although there have never been any statistical studies published that demonstrate cause, to many of the locals I spoke with there is a direct link between industrial contaminants and a perception of poor public health in Ashtabula. The conditions are colloquially classified as a cluster of "unexplained illnesses," whose precise cause is unknown but is widely thought to be complex and multifarious. Local knowledge about environmental illness cannot be dismissed as unscientific out of hand: several of my informants are medical or public health experts with firsthand knowledge and experience treating patients with a range of uncommon conditions.

Here, I explore ethnographic accounts of two major categories of illness: neurological and hormonal. In each case, I draw specific chemo-ethnographic links between the described

classes of illness and possible causal contaminants. Mansfield (2018) has argued that indeterminacy of bodily constitution and permeability are features of the Anthropocene. As environmental transformation proceeds, so too do human bodies become increasingly less certain. I present these accounts as examples of the Anthropocene bodies (my phrasing) Mansfield observed.

Vincina's Echo: The Chemosociality of Neurological Illness

Human exposure to chlorine and chlorinated compounds is marked by a rapid onset of neurological symptoms. There is a rapid onset of irritation of the mucous membranes, especially the eyes, nose, and throat. Direct skin exposure to liquid chlorinated compounds can cause mild irritation. Some compounds are more dangerous: chloroethane, for example, can lead to twitching, loss of muscle control, spasms, and unconsciousness. Direct skin exposure may even result in death. Chronic exposure and accumulation of such compounds has been linked to more severe nervous and muscular degeneration (ATSDR 2010).

Railroad workers who transported chlorinated solvents were frequently exposed to the dangerous fumes while working. One railroad worker I interviewed told me about a day when a rail car he and a coworker were in was suddenly filled with the fumes when a drum barrel spilled during transport:

> "We were on the car moving along, and all of a sudden we hit a bump, and this container of chlorinated liquid spilled. We didn't have gas masks on, and it suddenly overwhelmed me and my friend. My eyes, nose, throat all burned, and my lungs felt like they were on fire. We became dizzy and I remember nearly

passing out… I was out of work for a few weeks after that recovering. After the incident, I developed a twitch for a few months in my arms."

- Interview with RM, Ashtabula OH, Dec 10 2018

The retired railroader had described common effects of chlorine exposure. Although he could not remember the exact compound to which he had been exposed decades prior, the symptoms most closely align with chlorobenzene or chloroethene exposure. Federal scientific investigations of the long-term effects of chlorinated compounds suggest that prolonged or chronic exposure may eventually lead to permanent neuromuscular damage. In this subsection, I entertain the possibility that some of the neurological disorders of concern among elderly people in Ashtabula may be related to prolonged environmental exposure to chlorinated compounds.

In my conversations with non-health professionals residing in Ashtabula County, concern for neurological illnesses was usually predicated on personal experience. Most people with whom I spoke who expressed such concerns had themselves watched a family member suffer from such a condition. The most commonly referred to were Parkinson's, Amyotrophic Lateral Sclerosis (ALS), Multiple Sclerosis (MS), and dementia. Although the mechanisms and symptoms of these four illnesses vary, they share features of neurological degeneration that can eventually lead to death as important nerves no longer transmit signals vital to keeping the human body alive. In my interviews, I spoke with two former administrators of nursing homes in Ashtabula County, three medical doctors, and several nurses or nurse aids. One nursing home administrator had this to say about the prevalence of neurodegenerative disorders among Ashtabula's elderly populace:

> "As a nursing home administrator in a rural county, we have unique challenges that other homes in Ohio don't face. We have a lot of people with Parkinson's in this area, which results in a number of what you might call… DIFFICULT patient-provider relationships."
>
> - Interview with KH, Conneaut OH, 6 December 2018

Because people with neurodegenerative disorders often require advanced, intensive care and are frequently unable to communicate in socially appropriate ways (or sometimes even at all), they place a larger burden on healthcare providers. This nursing home administrator also pointed out that financial difficulties in the county made providing adequate care for these populations even more challenging:

> "There are lots of people out there with these issues who don't even have the option of going into a nursing home, either because they can't afford it or their insurance won't provide for it. That's a real problem: people who have these serious illnesses who are unable to receive treatment. And there are very limited public funds to help those people."

The final sentence reflects the fact, mentioned in chapter four, that many young people of working age have left Ashtabula, leaving behind an elderly, retired population. A link between environmental health and neurodegenerative disorders is not a new feature of my work in Ashtabula. In 2014, when I first began research for my Master's thesis, I partnered with a loosely aligned coalition of activists calling themselves The Vincina Protocol Project. Led by Mike

Helfinstine, the small cadre aimed to raise public awareness of a claimed cluster of ALS cases in Ashtabula County. Mike's wife, Vincina a.k.a. "Squeak," died of ALS in 2013. Although the group's activism eventually fizzled out over the course of my ethnography, they did arguably succeed in stirring up a local conversation about the perceived issue. I participated in two teleconference meetings with Representative John Patterson and then-Senator Capri Cafaro, who both represented Ashtabula in Ohio's State Legislature at the time; the meetings occurred in December 2014 and April 2016. The group also received notoriety in the form of several news stories in the Ashtabula newspaper, the *Star Beacon.*

Of course, "environmental" conditions can refer to things beyond the manufactured environment. Ecology and geography may also play a role. There are documented associations between MS prevalence and 1) northern European Caucasian ancestry, and 2) habitation at high latitudes, regardless of ancestry (Simpson et al. 2011). All of this points to a vast web of indeterminate possible and probable causes for neurodegenerative and other illnesses that makes it impossible to say with certainty what may cause a particular illness cluster.

Among Ashtabula residents, it is rare to attribute neurodegenerative illness to environmental pollution. The activists in VPP were seen by outsiders as eccentric outliers. Mike was ostracized and alienated for his abrasive, preachy tactics. And again, there was little concern for neurodegenerative disorders unless there was a direct familial relationship with an afflicted person. Other potential chemical-related illnesses mentioned in this section received significantly more attention than neurodegenerative ones, which were often even excluded from the category altogether.

"It's like my body is at war with itself": The Chemosociality of Hormones

One cluster of illnesses that emerged repeatedly during my conversations were disorders of the endocrine and immune systems, especially the thyroid gland. The thyroid gland is a small, butterfly shaped gland located at the base of the neck, overlying the beginning of the esophagus. This lump of spongy flesh may be small, but it has enormous importance in ensuring the proper functioning of multiple bodily organs and systems. Although the nervous system is typically regarded as the body's control center, with the brain occupying an important role as the body's central command, the endocrine system, too, plays a critical role in keeping bodily rhythms in sync. To use an institutional metaphor, the nervous system would be like the executive branch of government or board of a company, while the endocrine system represents the various government agencies or corporate departments subsumed within. The pituitary gland, or "master gland," acts as the liaison between the two, rightfully occupying space near the brain's base. The immune system, by contrast, is the body's security or police: it functions as a boundary against pathogenic invasion and serves other organ systems by ensuring their processes go on without interference. But in Ashtabula, there is a pervasive belief that something is entering bodies and breaking down the structural integrity of these vital organ systems.

The endocrine system is a vital part of human anatomy, but it tends to go unnoticed or unmentioned until there is a problem. In Ashtabula, I repeatedly heard from informants that they or someone they knew suffered from hypothyroidism, or an under-active thyroid gland. Hypothyroidism is most commonly caused by an autoimmune condition called Hashimoto's thyroiditis, in which the body's own immune system attacks and suppresses the thyroid gland. Symptoms of this condition include a swollen neck, fatigue, and emotional and mood changes. If the body does not produce enough thyroid hormone, then the overall rate and function of bodily

systems slows, sometimes to dangerous levels. Thyroid hormone stimulates these systems to expend energy efficiently, and its absence spurs widespread lethargy (NIDDK 2017).

Early in my research process, I interviewed two former high school classmates of mine who suffered from Hashimoto's thyroiditis. One was diagnosed at 13 and had her thyroid gland removed at 15, while we were in high school together. The other was diagnosed after graduation, her condition somewhat less severe. In each case, they also had family members with the condition: several uncles, in the case of the former, and the father, in the latter's case. During our interview, the former of these two patients had this to say about the statistical prevalence of the disorder:

> RB: "Do you think that your disorder is caused by genetics, since you have so many other family members with the same condition?"
>
> MG: "I think it's possible, but… I also think it could be something else. My doctor in Conneaut, Dr. Catlady, has mentioned to me before that this seems to be a really big problem in Ashtabula County. I'm sure she would be willing to talk to you and could give more information. But my guess is that there's something going on environmentally.
>
> - Skype Interview with MG, 22 November 2018

The suggestion that there could be an environmental health concern is legitimated by this informant's educational background: she has a B.S. in environmental science and works for a state EPA (outside of Ohio) as an environmental toxicology lab technician. In other words, her education and experience equip her with the knowledge to make certain scientific suppositions.

I took my friend's suggestion to reach out to Dr. Catlady. As it happens, Dr. Catlady and her spouse, Dr. Beard, are the parents of one of my high school best friends. Of course, these are pseudonyms. Such networks of accessibility were a privilege to completing my dissertation research in a timely and efficient manner. After a brief connection on Facebook, Dr. Catlady invited me to come to their home for an interview with her and Dr. Beard. I drove to their home, situated along Lake Erie, on a cool, lightly snow-dusted evening in December. The driveway was recognizable due to the presence of multiple large *Peanuts*-themed Christmas decorations—an obsession for which I had known my friend throughout our high school years. I could see where she got it. We held the interview in a wing of the home that housed an indoor pool. It felt surreal to be in the presence of warmth and have the odor of chlorine wafting through the air, tropical plants abound as décor, while the bitter cold sat outside. For nearly three hours the three of us talked about health and medical issues in Ashtabula. We focused on the prevalence of thyroid disorders, but naturally others also came up. What I learned was shocking.

First, by the numbers, in Dr. Catlady's own words:

> "In medicine, you measure statistical anomalies and expectancies according to the patient population. In a patient population of 5000 such as what I have here in Ashtabula County, one would expect to see about five cases of Hashimoto's thyroiditis. That's about a 1-in-1000 rate of occurrence. But I have 45 patients, which is nearly a 1-in-100 rate. That tells me that something is wrong, and whenever I talk about it with colleagues in Cleveland, they're astonished by those numbers."

Patient population is an imperfect measure of statistical prevalence. Many individuals are naturally left out of such a sample due to the simple fact that they see a different doctor. It is also logical to suggest that perhaps patients with such disorders tend to seek out Dr. Catlady. But the significance of encountering an illness rate ten times higher than what is to be expected is a discrepancy that would catch any statistician's attention.

When asked why she thinks this statistical anomaly exists, Dr. Catlady did not mince words:

> "I think you have to start by looking at the environment around us. There were and are so many different chemical industries in Ashtabula. Who knows what's even in the soil where I live? I had ovarian cancer, several of our cats died of cancer, and even my daughter has been diagnosed with Celiac Disease (an autoimmune condition). I've taken a real interest in all of this, because I want to know why it's happening."

Dr. Catlady and Dr. Beard suggested that, with regard to Hashimoto's, endocrine disruptors could play a role. Endocrine disruptors are manufactured chemicals whose molecular shape, structure, and polarity are similar to hormones manufactured naturally by the human body. PCBs, mentioned earlier in this chapter, have been observed to act as endocrine disruptors in laboratory settings. There is also some evidence suggesting that endocrine disruptors play a role in many cases of hypothyroidism by mimicking thyroid hormone's structure, binding to the receptors and preventing the actual hormone from linking. This causes the immune system to recognize the free-floating hormone as invasive. Once t-cells are formulated to fight the

hormone, the body becomes a permanent battleground, attempting to eradicate the helpful thyroid hormone. In extreme causes, the immune system will even attack the thyroid gland and receptors that house the hormone (Langston 2010; Boas et al. 2012; Jung et al. 2013, Ahmed & Ahmed 2017; Calsolaro et al. 2017).

Endocrine and hormone disruptors may also play an outsize role in other health conditions common to Ashtabula County besides hypothyroidism. Dr. Catlady and Dr. Beard were also concerned about what they saw as an anomalous prevalence of birth defects, too:

> "Many birth defects, you won't even know, because the fetus becomes unviable before a pregnancy test is even recognized. Those are the most severe ones, too—the ones that make life unviable. If they are born, it becomes harder. One common birth defect in this area is a duplicated vas deferens in men. This is the tube inside of the penis that transports sperm from the testes. I've had male patients in their 40s or 50s who come in for a vasectomy, leave, and then a few months later come back angry because they've gotten their partner pregnant. As it turns out, when we looked further, these men all had a duplicated vas: even though we had cut one, there was still another that could transport the sperm. This is a sign of a hormonal or endocrine imbalance that occurred while still in the womb."

In addition to hormonal and reproductive problems, Drs. Catlady and Beard also described what they had observed as a prevalence of autoimmune disorders, including in their own family. Their daughter—my high school friend—had recently been diagnosed with Celiac's disease, an autoimmune condition that affects the gut. I interviewed a variety of people with

autoimmune conditions including Celiac's Disease (x2), Hashimoto's thyroiditis (x2), rheumatoid arthritis (x2), lupus (x3), psoriasis (x2), and Crohn's Disease (x1). One patient had overlapping conditions, leaving a total of 11 autoimmune patients interviewed—more than 12.5% of the sample size for this dissertation. One of the informants who had been diagnosed with lupus described the experience as such:

> "My body is always tired, angry, hurting… it's like my body is at war with itself, trying to kill me while I just keep trying to live. I don't know what caused it. Both of my daughters have it too, so it might just be genetic."
>
> - Interview with KM, Sheffield OH, June 1 2019

The description of autoimmune conditions using wartime metaphors is stark imagery that presents a truly miserable condition in empathic light. The tendency among Westerners to use militaristic language to describe bodily permeability to disease is well-documented among social scientists (Haraway 1991c; Martin 1992; Guthman & Mansfield 2013). Mansfield (2018) suggests that a feature of the Anthropocene is that it forces us to reconceptualize these old ideas. There is an anxiety in coming to terms with one's own body being anything less than perfectly secure.

Why are autoimmune disorders so seemingly common in Ashtabula? Why have these narratives about possible environmental causes emerged? Why is the prevalence of an underactive thyroid more than ten times higher in Ashtabula County than in other places? These are questions that cannot be answered by state-of-the-art modern science, and so they lend themselves to imagined answers. Chemicals and pollution make up the landscapes the people of

Ashtabula know, and so they provide an astute setting for a story about contaminated bodies. Whether the tales are fact or fiction is beside the point; what matters to these people is the fact that it *could* be caused by pollution, and that is therefore a cause to investigate. This is in direct opposition to institutional frameworks, which present possibility not as opportunity, but as risk: if it is only possible that contamination caused the illnesses, then it is also possible they did not. The resulting funhouse of smoke and mirrors leaves the actual sufferers of these conditions anxious, confused, and worried.

Conclusion: Not Love Canal

I began this chapter by drawing on the historical and political economic connections between Fields Brook and Love Canal—a significantly better-known Superfund case study. There are multiple similarities between the two sites. Both Superfund Sites were partially caused by the actions of Hooker Chemical Company, were located in the U.S. "Rust Belt," and affected primarily white working class people. So what made Love Canal a national sensation, while even many current and former Ashtabula residents have never heard of Fields Brook?

The answer to this question lies in three specific differences. First, the relationship between industries and residents differed. At Love Canal, there were no industrial facilities present; only their toxic waste. This made it easier to frame Hooker Chemical Company as carelessly harming the Niagara Falls community. By contrast, Fields Brook was the site of 19 different facilities that actively employed Ashtabula residents and contributed to its economy. It was much more difficult to frame a company as a communal enemy when members of that community worked for or supported it.

The second key difference was in the population itself. In previous chapters, I referenced the State of California's finding that certain personality traits are commonly found in communities amenable to industrialization. The "least resistant personality" (Powell 1984; Hochschild 2016) typologically applies to Catholic European migrants—the ones who commonly settled in places like Ashtabula. Many of these people were lower working class. Love Canal, by comparison, was more middle-class and had fewer descendants of recent European immigrants. The population of Love Canal was therefore better socioculturally equipped to challenge toxic waste in their communities. Access to cultural capital—including finances, knowledge, and social networks—is an important distinguishing feature in which environmental justice movements are successful (Checker 2005).

The third key difference was the way in which risks came to be known to the wider community at each Superfund Site. At Love Canal, a public elementary school had been constructed directly over a contaminated groundwater table. The result was health effects that primarily manifested in the bodies of children. Children make for convenient symbols in environmental justice movements. They are regarded as vulnerable, innocent, and voiceless, thereby engendering public sympathy. The gendered response to Love Canal by Lois Gibbs framed motherhood at the center of the story. Eventually, national news and Presidential attention gave Love Canal its historical legitimacy as a landmark case study in environmental justice. The bodies affected by Fields Brook, on the other hand, were mostly those of the men who worked in the factories—a price to pay for economic stability, according to many. Fields Brook was much more open and visible than Love Canal, refuting the notion that immediacy and tangibility define which hazardous sites are addressed. Instead, it appears to be community

characteristics that play a defining role in shaping the trajectory of environmental justice movements.

The chemosociality of chlorination is at once both visible, yet indeterminate, a state of being whose molecular volatility can lead to unpredictable results. This is an adequate metaphor for studying the relative success of environmental justice cases: just as the effects of chlorinated chemicals are determined by the myriad other chemicals and biotic factors with which they interact, so, too, are the cultural impacts shaped by chemical interactions with different sociopolitical orders.

It was June 2014. I had just graduated from college, and was house sitting for my mother while she and my brothers took a weeklong vacation to North Carolina. My Dad had died about six months earlier, so I was caring for her many cats and dogs while she took some much-needed time away. Steven, then my boyfriend, was staying with me to help out and keep me company.

It was a nice day, so we decided to go to the Ashtabula Township Park along Lake Erie. As we drove along Middle Road and came to the intersection with State, we came across the industrial facilities still there. We turned right, driving past Detrex and over the bridge that crossed Fields Brook. As we did, a foul smell came into the open windows.

"Oh my God, I'm going to be sick!" exclaimed Steven, furiously rolling up his window. He has an acute sensitivity to smells. "What is that? Did you fart or something?"

Astonished, and a bit amused, I told him no, that was the chemical plant.

"Is that normal?" He seemed incredulous that such a smell was even allowed to exist.

"I don't know, I guess?" I responded, unsure how to interpret the word "normal."

Steven looked at me, incredulous. "I don't understand how anyone could live near this."

"I guess I never really thought of it before now." I responded.

Chapter Seven: Manufacturing Whiteness

Introduction: Clouds

I was seventeen when the clouds descended.

It was an unusually mild day in November. I and a few other friends had gathered at our friend Melanie's house. Roland Emmerich's movie *2012* had just started playing in theaters, and we were preparing to go see it together. We were gathered outside, walking around and talking, when suddenly we heard a loud, beeping siren that sounded like a descending chromatic scale. We had all heard the siren before: it was tested every Friday at 12:00pm by Millennium, the town's white pigment factory. But this was not a Friday at noon. We were gathered on a Saturday, and it was nearly three o'clock.

Growing up in Ashtabula, we had lived in anticipation of this moment our entire lives. The weekly tests, until then, were just that: tests. But this time, the unthinkable happened: there had been a release of titanium dioxide particles into the air, and the wind was carrying it into town.

My friends and I immediately went inside, into Melanie's home. Her mother, Tammy, was already in there, closing windows. "Here, shut the door quick and help me close these!" She exclaimed frantically, and we obliged. We had just managed to get them closed when we saw a white, cloudy haze slowly descend around the home's exterior. Within a few moments, it seemed as though an unusually white fog had come down. A dull odor that smelled like warm plastic

with a hint of rotten eggs came upon us. I remember instantly feeling as though I might develop a headache.

"Alright kids, you'll have to make do indoors for a while." Tammy said. "The phone alert said it should be passed within about an hour."

* * *

Since 1956, Ashtabula Township has been home to two factories that together provide the materials and processes necessary to manufacture titanium dioxide (TiO_2)—a highly-sought white pigment that is naturally occurring, but requires a drawn out chemical process to extract and utilize. The plant is locally known as "Plant 2" or "the Tickle Plant" after titanium tetrachloride ($TiCl_4$), the intermediary substance used in the production of titanium dioxide. As part of the Fields Brook industrial complex, Plant 2 sits directly on the corner of Middle and State Roads. Just north of Plant 2 along State Road runs Fields Brook.

Plant 2 and titanium dioxide occupy a unique chemosociality in the minds of many locals: while

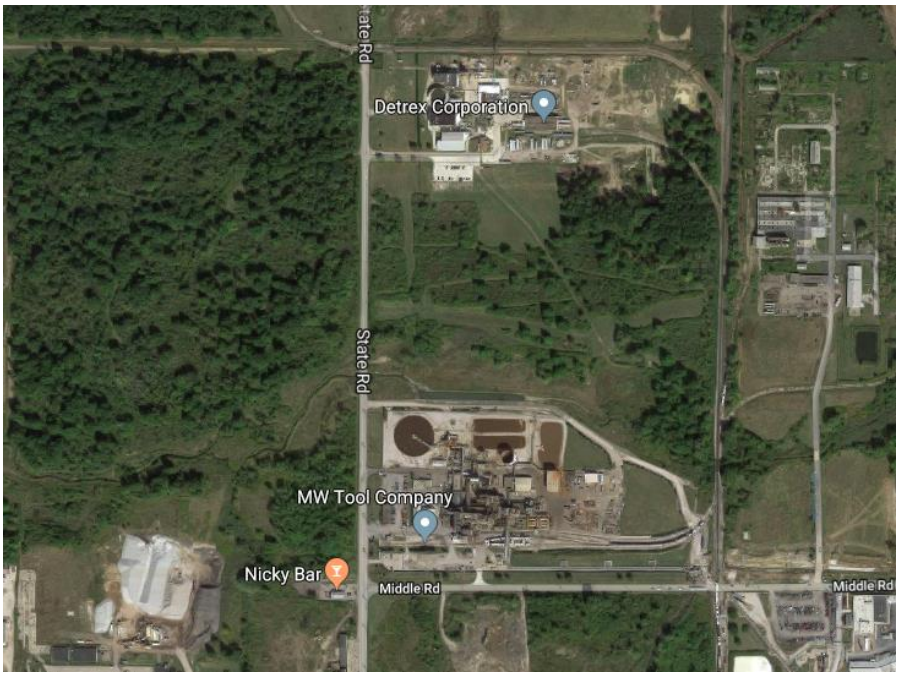


Figure 7.1: Satellite view of Plant 2. (Google Maps 2020)

the preceding two chapters explored the toxic legacies of less-than-desirable source of contamination, this chapter investigates the lone exception to the established rules. The “tickle plant,” as it is affectionately called, is accepted, if not outright embraced, because unlike other local industries responsible for the contamination of Fields Brook, the various companies that have managed this plant have worked to get out in front of the issue, dedicating significant time and resources to engaging with the public in such a way as to earn and maintain their trust.

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Figure 7.2: Plant 2 as seen from Middle Road. Photograph by Ryan Cook.

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How have the various companies that owned and operated Plant 2 been able to restore relations with a skeptical public while most others have failed? The answer is through a complex cultural reification of white working class norms, practices, and images that provide a cultural identity around the plant. White working class identity is a central part of Plant 2's image: the idea that an individual (usually a young, white man) can graduate high school and begin working at Plant 2 with a good wage and no student loan debt is a frequently pushed narrative to Ashtabula's young people. This narrative is a fundamental part of the trust relationship between Plant 2, its workers, and the community at large. It relies on a carefully articulated image of able-bodied white working class men that first emerged in the U.S. American South following the Reconstruction Era. At once, it might be observed, then, that Plant 2 is both literally and figuratively manufacturing whiteness.

This chapter is an ambitious effort to link disparate anthropological literatures on toxicity, deindustrialization, and white racial identity in order to predict the future. In proposing the dire need for intellectual visions that move beyond the hopelessness of anthropocentric disaster, Haraway (2016) proclaims that "Think we must; we must think!" Sympoetic thinking, emphasizing the "becomings with" of socionatural assemblages, is Haraway's solution. Here, I employ sympoietic thinking to tackle the problem of white racial identity through the lens of chemo-ethnography. I describe how Plant 2 has come to embody an ideal of a conservative, white working class male in an era of postindustrialism, and the role this plays in creating

localized “raciontologies” (Rosa & Díaz 2019)—states of being grounded in race. Here, I modify the concept of a raciontology according to Tsing’s (2017) definition of ontics to describe a raciontics chemosociality of the white working class. I present white working class chemosociality as a raciontic that emerges from postindustrial factory life.

Chemical Profile: Titanium Dioxide

Titanium dioxide, or TiO_2, is a naturally occurring compound with a wide range of human uses. Titanium dioxide appears in nature as a fine white crystalline mineral in two formations: rutile and anatase. Each of these minerals are commonly mined from heavy mineral sands ore deposits that occur near shorelines. Titanium dioxide is valued for its brilliant white color: industrially, titanium dioxide is known as “titanium white” and is an important white pigment used in a variety of products ranging from food to clothing to pharmaceuticals.

Figure 7.3: Titanium dioxide powder. (Encyclopedia Brittanica 2020a)

Manufacturers sometimes call titanium dioxide “the perfect white” for its high refractivity and opacity. Approximately 80% of global consumption come from use in paint, thinner, paper, and plastic; 12% is classified as industrial use in creating materials such as electrical ceramics, chemical intermediates, and catalysts; the remaining 8% is used as pigment or dye in food, pharmaceuticals, and other disposable household items (Ceresana 2018). The widely used pigment has been mass produced and globally circulated for over 100 years.

There are two main methods for extracting TiO_2 from its source minerals. The appropriate process depends on the specific source mineral. Both processes involve treating the source mineral with a reactive compound to extract titanium. The “sulfate process” is the most common method of production and is used exclusively for ilmenite and other highly concentrated feedstocks. The “chloride process” is used for feedstock with less concentrated titanium content. This is the process employed at Plant 2 in Ashtabula. During the chloride process, feedstock is treated with chlorine and carbon at 1000 degrees Fahrenheit in a highly pressurized environment. The ensuing reaction produces titanium tetrachloride, $TiCl_4$, colloquially known as “tickle.” $TiCl_4$ is an intermediary product which is then distilled to re-produce pure TiO_2. The two phases of the chemical reaction for the chloride process are summarized as such:

$$2\ FeTiO3 + 7\ Cl2 + 6\ C \rightarrow 2\ TiCl4 + 2\ FeCl3 + 6\ CO$$

$$TiCl_4 + O_2 + Heat \rightarrow TiO_2 + 2Cl_2$$

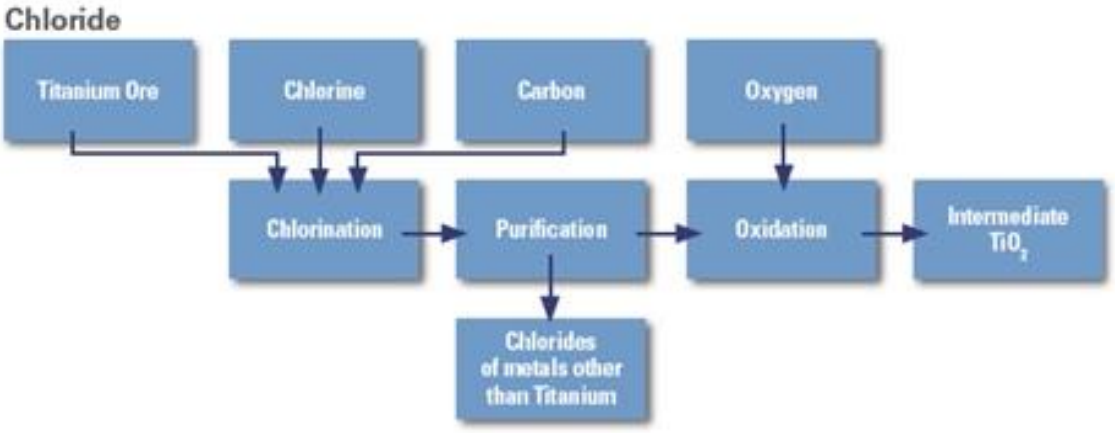

Figure 7.4: Summary of steps for chloride process manufacture of TiO_2. (Guichon Valves 2019)

However, recently, titanium dioxide has come under increased scrutiny, leading some companies and governments to seek alternatives. The International Agency for Research on Cancer classified the pigment's powdered form as "potentially carcinogenic to humans" after observing that lab rats exposed to it commonly developed lung and other respiratory cancers (Kuempel & Ruder 2006). This designation prompted a wider inquisition into the widespread use of TiO_2. In 2015, Dunkin' became the first major company to eliminate TiO_2 from its products (Isidore 2015). In 2019, the French Health Minister fully banned TiO_2 as a food additive (Foreign Agricultural Service 2019).

In Ashtabula, the production of TiO_2 *vis-à-vis* the chloride process at Plant 2 is regarded as a fundamental part of the local economic metabolism. As such, it evokes a cultural order that reifies industry as necessary to regional prosperity. I found repeatedly that titanium dioxide was, as one worker put it, "not like the other chemicals." In other words, it was generally regarded as a safe and essential part of Ashtabula's economic functioning. Without Plant 2, many believe Ashtabula would be even worse off than they presently perceive. Since its construction in 1956, Plant 2 has changed ownership multiple times. And yet, it is still standing, a testament to an

industrial legacy for which many Ashtabulans yearn. As other facilities, especially around Fields Brook, have shut their doors in recent decades, Plant 2 is a symbol of pride. It is also a fiercely defended resource that even staunch environmentalists are unwilling to attack: one activist in the group Ashtabula County Water Watch described Plant 2's then-owners Cristal as "the good guys."

Titanium dioxide is a valuable commodity produced along a global chain of extractivism, refinement, manufacture, and distribution. Ashtabula thus plays a central role in the global circulation of TiO_2, upon which the unique chemosociality of this product is based. Carcinogens and odors are regarded as unpleasant necessities to everyday prosperity. Yet, embedded in all this scientism is the very real link between production of white pigment and production of white racial identity. In light of recent pushback against the ubiquity of titanium dioxide, attacks on the pigment ring like attacks on character and pride for the workers of Plant 2 and their families and friends. A chemo-ethnography of titanium dioxide inquires into the nature of its production and circulation: how does an artifice such as Plant 2 become an accepted part of a local economy? And why is TiO_2 perceived as safe and necessary, while other chemicals—the previously discussed radionuclides and chlorinated compounds, for example—are the points of genesis for activism and risk society? Drawing on interdisciplinary literature on the social construction of whiteness, the following sections try to explain these social facts.

Creating "White Working Class" Identity

In Ashtabula, I found that white working class identity was structured around particular commodities produced in a given area. Locals have pride for products made in Ashtabula, even if it was in the distant past. When discussing the legacy of Fields Brook and other polluted sites in

the county, residents would sometimes display a curious cognitive dissonance, at once lamenting the poisoned water and soil but also praising the economic impact of industries past. In previous chapters, I touched on this theme of industrial defense as a part of Ashtabula culture: cultures of silence are pervasive and extend beyond factory gates into the communities they occupy. Cultures of silence embody specific meanings attributed to white working class identity: the white working class individual is a masculine patriarch who provides for his family. He is inoffensive and does not "rock the boat" by speaking out of turn, but will fiercely defend his honor if it is threatened. Because work is honorable, to threaten his job means to threaten the dignity of the white working class man, his family, and his community.

The centrality of masculinity to this image is paramount, for the white working class at once evokes a third category: gender. Other anthropologists (e.g. Rolston 2014) have recognized the gendered nature of work in extractive and manufacturing industries. Labor and political identities in the United States revolve around masculinized notions of citizenship and community participation. Men are central to the story of work; women have historically been peripheral. In my own interviews, most of the informants who could provide direct information about working in factories in the mid-twentieth century were men. However, this eludes the fact that many women also worked in factories in various roles: as secretaries, nurses, managers, and even on the floors at times. Women were also central to telling the story of Fields Brook: in cases where men were not available to tell their stories to me directly, their wives and daughters sometimes stepped in to share knowledge on their behalf.

All of this reflects a fact I have already discussed: that white working classness is both too monolithic and too vaguely defined. It is a superimposed identity crafted and replicated by and for political and media interests. Intersectionality (Crenshaw 1989) is a concept used by

social scientists to describe the overlapping structures of power that create individual lived experiences, and one which would seemingly be appropriate in describing the nature of white working class identity. One problem with intersectionality is that it implicitly assumes omnipresence of all marginalized fields. In the case of the white working class, this only serves to reinforce the monolith. It also contradicts what I observed on the ground, not matching how my informants appeared to construct their racial, economic, geographic, political, and gender identities. Instead, in keeping with the more-than-human framework I have adopted, I prefer to replace intersectionality with the concept of entanglement, defined by Nading as "the unfolding, often incidental attachments and affinities, antagonisms and animosities that bring people, nonhuman animals, and things into each other's worlds" (2014, 11). Rather than describing an intersectional identity, I argue that the category white working class instead describes entanglements of race, class, and gender that come into focus under different circumstances. Such entanglements are the product of chemosocialities.

Ashtabula, like many other Great Lakes cities of its size, was the location of immigrant settlement throughout the late nineteenth and early twentieth centuries. Italians, Germans, Hungarians, and Portuguese migrated from Europe. Finns and Swedes, who had initially migrated to West Virginia to work in the mines, later moved north to work in the factories after the first coal bust (Feather 1998). As I addressed earlier, communities composed of European immigrants of different nationalities were found to be among the "least resistant" to potential industrial development in their communities (see Chapter 3). This, along with the accessibility to natural resources, especially water, drove industrial development in Ashtabula County throughout the twentieth century.

Social scientists have observed the development of ethnic enclaves in municipalities with high concentrations of immigrants (Bubinas 2003). Ashtabula is no different. Informants, especially older Italian men, eagerly spoke of their ethnic heritage and identified specific sections of town as Italian dominated. They referred to sections of the city off of Lake Avenue as "Little Italy." Likewise, other areas of Ashtabula were also known for their concentrations of other ethnicities. "Swedetown" described the section of neighborhoods on the east side of the Ashtabula River where Swedish immigrants settled. This was also the location of some of the households most directly impacted by Fields Brook Superfund Site. The concentration of Swedes was used in an Ohio Department of Health study to argue that high cancer rates could not be attributed to chemical pollution conclusively due to genetic homogeneity among residents.

Labor in Ashtabula divided along lines of ethnicity, with new immigrants taking on some of the most dangerous jobs. Local historian Carl Feather (2017) has documented the tragic history of lethal accidents that took place at Ashtabula's docks. Young immigrant men were most often the victims of these tragedies. Italians often worked on the railroads, creating a sense of ethnic community around a shared activity, and offering a group to mourn fallen friends who died in work related accidents. In an earlier chapter, I described a series of lethal accidents that occurred at Ashtabula's coal docks which left several young Italian men dead. The dangerous nature of industrial work was a fact of life that shaped the meaning of being a descendent of Italian immigrants in America.

Historians including Roediger (1991), Hale (1995), and Isenberg (2016) have observed that white racial capital is often subtly coded in linguistic exchanges. I found this to be true in Ashtabula. While individuals spoke of their ethnic heritage proudly and openly, their means of

talking about race were usually less direct. Take one example from an early interview with an Italian man who formerly worked for Conrail:

> RB: "How has Ashtabula changed over the years? What is different about it today than before?"
>
> RM: "Well… you know, I'm not a racist, but… some of the parts of town, where you see black people living… are just not good. It's run down, more crime. So that's a big difference, because a lot of those neighborhoods used to have good, working families in them."
>
> - Interview with RM, Ashtabula OH, Dec 10 2018

This quote tells us three important things about how the white working class conceives race. First, by starting with the phrase, "I'm not a racist, but…" the informant conveys a specific definition of racism that is widely accepted by anthropologists to be, at best, outdated, and at worst misguided: that racism is premised on a hatred or dislike of people of different skin colors. Invoking this phrase seems to be a discursive get-out-of-jail-free card, a self-imposed permission slip to speak candidly about one's racial views without having to account for them in the end. This is critical because it demonstrates the taboo nature of discussing race among whites. To openly talk about race is against social norms because it may offend the status quo.

Second, the quote also tells us something about how RM imagines Ashtabula today. As I discussed in Chapters 3 & 4, Ashtabula is remembered more for its economic prosperity than its industrial pollution, even though the two go hand-in-hand. The legacy of industry to rural whites is "small town America", not environmental degradation or bodily poisoning. Today, Ashtabula

is run-down and depressed. Without fail, every single person I interviewed decried a perception of Ashtabula as a rust belt ghost town, devoid of economic opportunity and riddled with a pervasive drug problem. Some held more optimism than others that things may improve, and were quick to chastise what they saw as a shared sense of over-pessimism. But even those folks were forced to reckon with the reality that Ashtabula has one of the highest rates of opiate overdose of Ohio's 88 counties (ODH 2019). The persistent believe that the surrounding community is plagued by problems is an important feature of white working class identity in Ashtabula and other places like it.

Third, the quote tells us something about how RM views black society and culture, and how the introduction of that culture affects Ashtabula. RM, like many others, uses language that implies he views non-whites as prone to unemployment or underemployment, drug use and trafficking, sexual violence, and other criminal or immoral conduct. Unlike white work, he and others view the work of minorities as a threat to white labor. In both interviews and observations I found myself floored—and at times challenged to maintain ethnographic neutrality—as people around me spoke of non-whites as stealing economic opportunities. Informants often described minorities as unworthy of the opportunities. One Ineos plant employee said he did not understand the desire of companies to hire Latino workers:

> "I don't get why they hire Latinos at all, to be frank. They just don't do as good of work, because they don't care, because they have to be moving around all the time to avoid getting caught anyway."
>
> - Interview with TS, Ashtabula OH, December 16 2018

The quote by TS corroborates RM's views of non-whites as "other" and demonstrates the tendency to homogenize groups based on assumed characteristics—in this case, the stereotyping of Latinos as illegal immigrants. Whites are permitted to navigate the boundaries of ethnic difference seamlessly, while non-whites are discursively constructed as monolithic identities.

White freedom to selectively situate oneself within particular ethnic and racial boundaries is a hallmark of how white identity entangles with political power. Affiliations suit the particular class interests of different racial groups, serving to reify a particular political order. In the past, the coalition of working class whites served the National Democratic Party, whose empowerment depended on suppressing black political citizenship (Roediger 1991; Hale 1995). The construction of racial identity around idealizations of work has permitted whites to continue to set the American political economic agenda. This explains the continued dominance of white working class discourse in political media.

Racial constructions based on ideations of decency, honor, and hard-work are chemosocial in Ashtabula because these values were forged in the chemical factories. The workers interviewed for quotes presented above developed their racialized notions of work by working at or near Plant 2. "Good, working families," as RM called them, embody white working class values, especially a willingness to perform intensive labor. Moreover, working-class whiteness is coupled with notions of being a law-abiding citizen. "Others"—in this case, blacks and Latinxs—have their identities coupled with harmful stereotypes (welfare and drugs in the former; illegal immigration in the latter). By formulating ideas of race, gender, and class in chemical factories, the process becomes markedly chemosocial. Images of whiteness as well as otherness are constructed through the gaze of white observers, who reinforce their visions in factory life.

The Company Town: Chemopower in Everyday Life

Now that I have established some of the ways white racial identity is perceived and expressed in Ashtabula, I next turn my attention to understanding how industry becomes a part of that identity. Investigating the contemporary hydraulic fracturing (also known as "fracking" or "fracing") boom in western Pennsylvania, Cooley & Casagrande (2017) coined the term "energopower" (an extension of Foucault's biopower) to describe the hegemonic stranglehold of U.S. energy discourse over the small towns in which they conducted their ethnography. Cooley & Casagrande found that energopower was the social mechanism by which industry garnered acceptance in a community. Energy discourses surrounding themes such as prosperity, national independence, and economic growth guided communities toward a tacit acceptance of local industries and worked to squander dissent.

One limitation of the present conception of energopower is that it does not interrogate the historical conditions that made hydraulic fracturing a possible discourse in Rust Belt communities. Many of the places where fracking is now commonplace have long industrial legacies. Ashtabula is among such locations, especially south of I-90 where ODNR has permitted multiple fracking wells in recent years. This has drawn the attention of local environmental activists such as the Ashtabula County Water Watch. But the social conditions that underlie fracking debates in places like Ashtabula were set decades ago. Continued development intricately entangled with conceptions of white working class identity.

Thus, I propose a modification of energopower to account for the breadth and historicity of the Rust Belt's blasted landscapes. Chemopower describes both the formal and informal tendrils of Ashtabula's chemical industrial legacy, and more accurately describes the discursive framing from which both activists and advocates approach contemporary environmental debates.

Moreover, chemopower also acknowledges plighted citizenship (Benson 2011) as a part of Ashtabula's reliance on industry. Chemopower is a hallmark of white working class Ashtabula because the chemical factories that dominated the landscape were a critical feature in multiple aspects of societal functioning, and are therefore inseparable from its decline. One informant who lived in Ashtabula during the second half of the twentieth century provided an insightful description of Ashtabula's community in the past:

> "Ashtabula's industries may have been dirty and unhealthy, but a lot of things in the community depended upon them. Community leaders and engaged citizens were often the more educated plant managers, for example, and those were the people who would get elected to office. Edgewood High School was one of the best high schools in the county because they were funded by the property taxes from businesses dumping into Fields Brook. That Tickle plant is about the only place left that can keep some of that going."
>
> - Interview with CH, North Kingsville OH, 8 Mar 2019

This quote is representative of how I found many local people think of industries. Industries are seen as having positive effects that expand beyond their factory gates. Tax revenue and consumer spending are multipliers which benefit entire communities, even the people who do not work at the factories themselves. Informants equated the loss of industry and jobs to a loss of community resources and values. By continuing to promote aspects this individual sees as good parts of living in a white working class town, Plant 2 reproduces relevant aspects of white factory communities.

Many of my informants perceived the loss of important markers of local identity as threatening. As a result, there is a desire to protect what industry remains, and to seek compromises that will reduce the amount of public discontent. Industries operating at Plant 2 have been at the center of these efforts. Company practices—particularly by Millennium and Cristal, who owned Plant 2 throughout most of Fields Brook's cleanup—have set a regional standard for how companies seek the trust of the communities in which they reside. Now owned by Ineos Pigments, the community continues to regard Plant 2 as one of the best places in Ashtabula to work. It is a symbol of its white working class industrial identity. In this sense, it not only manufactures white pigment, but also white identity.

Plant 2's owners have employed a broad theme of community in both their internal and external practices. Taken together, the practices have reinforced public trust in the facility, which in turn reproduce Ashtabula's white working class identity. Internally, the company provides generous pay and benefits. The starting wage for a worker with no prior experience is $18 per hour, with annual benefits valued at ~50% of base salary. Annual retention and performance raises mean that some late career workers earn up to $250,000 a year. There is regular monitoring and training related to worker safety. New employees are given a presentation that outlines the history of Plant 2's complicated environmental legacy, including Fields Brook Superfund Site and the actions taken during cleanup.

Externally, the company strives to build an image as good stewards of the environment and local community. Ineos and its predecessors have been part of the Ashtabula County Community Advisory Panel (CAP)—a group of concerned citizens, industry representatives, elected officials, and economic planners whose goal is to engage industries with local people. The CAP structure is not exclusive to Ashtabula County: following the Union Carbide Bhopal

Disaster in 1984, the American Chemical Society recommended the creation of such panels in order to restore lost trust in chemical industries. In Ashtabula, the group meets monthly at the Ashtabula County District Library and provides a free meal to all in attendance. I attended a meeting of the CAP in March 2019, where the focus was on safety. Member industries gave presentations on recent injury trends and safety training in the workplace. There was a review of community alarms, including the one I described remembering at the beginning of this chapter. Throughout, there was an emphasis on developing a sense of connection and relationality among attendees. This worked in my favor, as it provided an opportunity to meet and request interviews from multiple stakeholders.

Further demonstrating the company's unusual transparency, Ineos was the only company among the nineteen Fields Brook PRPs that actively participated in my research. With some limitations, Ineos representatives either provided or directed me to relevant information. I was even granted an interview with Plant 2's environmental health and safety manager, although audio recording the interview was not permitted. The manager and I met in his office and discussed the history of Fields Brook and efforts taken to clean it up. He then took me to the floor of Plant 2, where I got to see firsthand the equipment used to produce $TiCl_4$. Before we went over, I was loaned an awkward set of safety equipment that I barely seemed able to even put on properly: protective goggles, a hard hat that would not stay on straight, gloves covered in TiO_2 dust (that I got all over my clothes and face), and steel toed boots that would not stay tied because they were ½ size too large. The manager also walked me to various parts of the property to show me landscape modifications made during the cleanup. For example, there are now several large retention ponds that serve as a buffer to halt contaminant intrusion into the brook. The retention ponds are visible from the aerial photograph in Figure 7.1. Unfortunately, I was not

provided permission to take my own photographs of the tour. No post-industrial version of the iconic "anthropologist in the field" photograph for me.

The fact that I was not permitted to take photographs was one limitation of the industrial trust Ineos was willing to extend to me. While some exercises of chemopower seek to positively reinforce community trust, others are distinctly employed as a means of silencing dissent. Conversations with informants provided similar examples of Ineos' exertions of chemopower to withhold certain information. Recalling again my conversation with a middle-aged man who works for Ineos, this quote stands out:

> "Now listen—make sure you don't use my name. I'm supposed to tell you to call the plant directly and talk to the environmental health and safety manager. I could get in trouble just for talking to you about this."

Plant 2 workers, just like those at other facilities discussed in earlier chapters, were bound by a code of silence, directed by their managers not to speak about the company or its activities. This man feared that if I outed him as an informant, he could lose his job. Although Ineos and its preceding industries are regarded as good places to work, this shows the limitations of their efforts to equalize the playing field between themselves and Ashtabula citizens. Corporate chemopower silences workers without even needing to maintain a physical presence.

Another former employee of Cristal, the previous owners of Plant 2, had this to say about the company's transparency with its environmental codes:

> "There are small releases all the time that they don't sound the town alarm for. If there's a cloud that gets out, a lot of the time it's just a manager's discretion. They'll eyeball it, and say, 'Oh, that doesn't look like it got beyond the gate.' But just because you can't see it doesn't mean there aren't particles that get out… There's sort of a dual logic to that. The company doesn't want to assume liability, and so they're skirting the regulations. But also, they don't want to incite fear. If they sounded the alarm every single time there was an actual release—no matter how minor—you would hear it a lot more frequently."
>
> - Interview with AC, Ashtabula OH, December 23 2018

Here, we observe the chemopolitics of risk and knowledge as they pertain to Plant 2's role in enforcing white working class deference to industry. On the one hand, this former employee recognizes that Cristal had technically been bending environmental laws through this practice, and that this was both unethical and dishonest. On the other hand, she also seems partially resigned to the logic of industry in governing risk. Plant 2 strives to be perceived as transparent to an extent: the limitations of transparency lie at their perceived threshold at which a knowledgeable public ceases to be compliant.

"We NEED Industry": Reproducing Whiteness in Postindustrial Times

One important fact about Plant 2's role in manufacturing whiteness is that it is a template for the relationship other industries should have with Ashtabula residents. Locals expect incoming industries to practice similar principles of inclusion, such as working with community partners and offering high wages to workers. This is codified at the executive level of county

development. At its core, industry continues to be seen as a community necessity. Anna Willow (forthcoming) has proposed a five-point framework for understanding why some people take action against environmental threats. One feature of this framework is the capacity to envision alternatives—something Appadurai (2004) has called the "capacity to aspire." In white working class communities, this capacity is squandered and replaced with tacit acceptance of chemopower. Those who act against industry are marginalized and perceived as threats to the social order. There is a tendency to promote the need for continued industrial work as a matter of community character.

I experienced firsthand the sometimes dismissive and mistrustful way power brokers in the county treat people perceived to be skeptical of industry. Often, I found that the groups most likely to adopt this defensive posture were not the industries themselves but their political advocates. I attended a March meeting of the Ashtabula County Commissioners to learn more about a recent renewable energy study at Fields Brook which had been published in the local news. I had met all three commissioners previously: one worked with my father, one directed his funeral, and the other was a friend of a family member. While inquiring about the proposed renewable study, one commissioner remarked that I "ask a lot of questions" after I sought to clarify or find out more information from their thin responses several times.

Chemopower also manifests in the discourses surrounding new industrial development away from Fields Brook. The good stewardship of a few companies can foster trust that makes it possible for further partnerships to evolve. The Growth Partnership for Ashtabula County is a central figure in the effort to draw industry to Ashtabula. Founded in 1990, the Growth Partnership is a group of civic and business leaders whose goal is to promote economic growth throughout Ashtabula County. While the group does not have official governmental status, its

bipartisan membership includes a County Commissioner and Ashtabula's City Manager. The Growth Partnership is a member of the CAP, and its own employees regularly attend CAP meetings.

Recently, the Growth Partnership has worked with Petmin, a global producer of iron metal, to bring the plant to the community. The partnership has been ongoing for several years and entails an extended working relationship. The goal is to promote community trust by working with the company to fulfill mutual needs. My interactions with some of the members of the Growth Partnership were among my tensest conversations. This stemmed from a December 2018 meeting held by Petmin and the Ohio EPA to discuss the company's air pollution permit application. At the public meeting, I found myself unable to contain commentary during a presentation by a state environmental health analyst. Gathered in a large room with about 150 others, the analyst presented a slide on a projector that listed various chemical formulas and quantities in different measurements. The analyst recited the names of compounds and the quantities, but gave no context or explanation. It was clear from the confused faces throughout the room that few people understood the meaning or purpose of this slide, so I raised my hand to ask a question. When I was called on, I had my own "Gary Zalimeni" moment:

> "I'm not sure I or most in the audience understood the slide about various contaminants. Could you please go back to that slide and tell us what compound is represented by each formula, the potential negative health effects they have, and what the quantities mean?"

It was clear that the analyst had not expected such a pointed question. He returned to the slide and began naming compounds and their effects: "Sulfur dioxide… that's linked to heart disease and lung disease…" As he did so, people around the room began to mutter to one another. After a few minutes of this, the rehashing was cut off by the Ohio EPA communications coordinator, who was obviously much better versed in managing public forums.

Several months later, when I had the opportunity to interview three employees of the Growth Partnership in June 2019, this moment was revisited by the executive director:

> "I remember you from that meeting, and I remember the question you asked… I actually did not like that question. Because, I think it gave people the wrong idea. I want people to see this project as a good thing for the community. And it seemed like you wanted to get people to talk about something else. I think it stokes fear that doesn't need to be stoked. The fact is, we need these industries, and we want folks like Petmin who work with us here at Growth Partnership to get it right."

I was taken aback by the confrontational nature of the recollection. I had not perceived my question as threatening, but rather clarifying. I felt as though this informant was calling my status as a legitimate researcher into question—a sense later reaffirmed by the following exchange:

> GM: "Let me ask you something, Richard. What do you think of the Petmin project? Do you think it's a good thing or a bad thing?"

> RB: *after pausing for a few seconds* "I guess I don't see it as black-and-white. I see what it could do for the community, and having grown up here, I fully understand the need for good jobs. But at the same time, I don't think it will solve all of our problems, and I do remain concerned that some folks in the community may lack a full understanding of what it will bring.
>
> GM: "I understand where you're coming from. From my position, here at Growth Partnership, I want companies to come to Ashtabula, to provide us with good jobs that can keep our community prosperous. And I want them to work with us so that we can be sure they're doing things that will be good for us all. If they can't show us how they will be a net positive—not just neutral, but a positive—then we won't work with them. And so, wouldn't you say that we need that? Because to me, it's a simple fact: we NEED industry. If they don't come in, who will?"

Throughout my interview with representatives of the Growth Partnership, the dialogue was alternately productive and confrontational. This was not helped by the fact that the group interview was done with three members of the Partnership, two of whom seemed determined to put me in my place any time I said something that may have contradicted their beliefs. For example, at one point I mentioned a quote from a different interview, in which an informant referred to CAP industries as "the good guys," which two of the three quickly corrected:

> "I absolutely would not say that the other companies are bad guys, but there are different ways of being good stewards."

Another tense moment occurred when discussing potential contacts for additional interviews. By this time, I had conducted more than fifty interviews with a variety of individuals and considered my project nearly complete. I mentioned this fact to the directors, and this exchange followed:

> CR: "Well, have you spoken to the people at the health department about your hypothesis, that there are environmental health issues?"
>
> RB: "I have not, but I am familiar with the recent community assessment and other older studies on the issues."
>
> CR: "Because I really think—no offense—that if you are just out there talking to, I don't know, random people, I'm not sure how good your information is."

Here, there is a clear implication that "expert" knowledge is valid and valuable, while "talking to... people" is perceived as a form of activism or storytelling. This demonstrates an alarming hostility to community perceptions of the project, as well as a disengagement with the process of creating buy-in. My interpretation of and concern for Growth Partnership's unilateral approach was shared among community activists, who felt that they had been silenced or minimized for asking questions or expressing concerns.

Taken together, my experiences with Ineos, the Ashtabula CAP, and the Growth Partnership demonstrate an important point about white working class values. Industry, as a source of jobs and economic prosperity, is a vital and necessary resource. Industries today live in the shadow of their polluting predecessors. They live with the burdens of past mistakes and the anxieties of preventing future errors. Simultaneously, there is a defensiveness and desire to

protect economic growth, especially by those with vested political interests. All of this leads to the construction of a discourse of community stewardship which reinforces the symbiosis of Rust Belt communities with manufacturing industries.

Anthropocene, Capitalocene, Chthulucene… Trumpocene?

I want to step back for a moment and consider what it means to have a white working class identity in the Anthropocene. Recently, in their introduction to a special section of *American Anthropologist* titled "The Anthropology of White Supremacy," Aisha Belisio-De Jesús and Jemima Pierre (2019) noted that the Anthropocene is just one area of anthropology where scholars have failed to engage critical theories of race. Donna Haraway (2016) has similarly written passionately against the Anthropocene, deriding it as a science fictionist apogee of anthropocentrism. But unlike those political economy theorists who prefer the term "capitalocene" as a more accurate descriptor of the cause of environmental catastrophe, she instead advocates for a conceptualization that rejects competition and antagonism: a "Chthulucene," in which creatures come together to enact a world based on cooperation, not competition. In her recent writings, Haraway has challenged audiences to dispose of bounded individualism and human exceptionalism as ontological frameworks. The result is a seemingly utopian vision for the future guided by sympoiesis—*becoming with*.

Haraway's vision for the future is intriguing and, in my view, ideal. But, as I argue, it is important for anthropologists to engage with those with whom we do not agree. Moreover, it is clear that Haraway's concept does not help us theorize about race in the Anthropocene. In this case, there is an alternative vision for the future that rejects Haraway's sympoiesis, and instead doubles down on the old paradigm. This is a vision shared by many (though not all) of my

informants, and one that ties into this dissertation's thematic investigation of the conditions of late industrialism. Reflecting once again on Fortun's (2012) call for anthropology of late industrialism to be about staging encounters, I find that the relationship between political conflict, deindustrialization, and environmental disaster making in Ashtabula County is about the conflict that arises when two novel paradigms encounter each other. Deindustrialization has forced a rupture in the white working class psyche that has two possible futuristic resolutions. The first is Haraway's Chthulucene. The second is what some authors have called the "Trumpocene."

The Trumpocene, like the Capitalocene, is the result of Western neoliberalism gone awry. It differs fundamentally, however, in that it is self-conscious of the disaster it brings—and it does it anyway. In the Trumpocene, bounded individualism and human exceptionalism are reified explicitly, rather than just alluded to. Critics have noted that the Trump administration's policies tend to favor economic growth over the protection of environmental or human health. This is a feature of the Trumpocene, not a bug: the dominant force changing the Earth is not humans, or even capitalism, but the selfish pursuit of profit by those gluttons at the top. The Trumpocene is a form of what I call raciontics, a synthesis of Rosa & Díaz's (2019) raciontologies and Tsing's (2017) ontics. Ontics describes more-than-human ways of being in the Anthropocene. Therefore, a raciontic describes racialized ways of being in this dark time. The Trumpocene is a particular raciontic adopted by white working class supporters of neoliberal industrial policies.

Though I eschew the legitimation of Trump through my own academic writing, I find it impossible not to refer to him in this way based on my own research findings. Informants from across the political spectrum mentioned his name frequently, even though I made it a point to never bring him up myself. President Trump came up by name at least once in every single

interview I conducted except one—and even in that interview where he was not mentioned by name, the informant made other statements expressing support for "the Republican Party's current policies and leadership." To some, a Trumpocene framework seemed to be a guiding light for their understanding of human relations with nature. An interview with an 84-year old white male Trump supporter holds a revealing passage:

> RB: "How do you think Ashtabula fits into the nation as a whole today?"
>
> RK: "Well, I don't know how you feel about this, and I don't really care, but I think President Trump is the greatest thing to happen to this county in about thirty years. He has done so much that is improving our local industries in terms of cutting EPA red tape. During the Obama years, you had the coal plant shutting down and we lost our docks shortly after. Now, I can see it's all coming back.
>
> RB: "Do you think that environmental regulations were responsible for job losses prior to his election?"
>
> RK: "Well, I certainly think that was part of it, yes. Not all, but part. You had these overzealous environmentalists who wanted to stop all development for… I don't know, a tree or a bird. But with Trump, he doesn't take that kind of crap."
>
> - Interview with RK, Ashtabula OH, Dec 17 2018

When the topic of President Trump was raised, it was usually in response to this question. Ashtabula residents, whether they support Trump or not, frame their understanding of Ashtabula's current place in the world based on his policies. Occasionally, more politically attuned informants would point out that Trump had appointed an Ashtabula native, Robert

Lighthizer, to lead the United States' trade negotiations with China. Many of his supporters found ways to translate Trump administration environmental policies directly to their lives, as in the following quote:

> RB: "What has President Trump done that you think has been good for Ashtabula County?"
>
> JD: "Well… the Paris Accords, withdrawing from the Paris Climate Accords, was a good thing. Why should we as a country have to pay that much money when nobody else is? And why should my taxes go to some country halfway around the world to help them do what we've been able to do here in the U.S. for 30 years in terms of stopping pollution? So, uh… so yeah, I think that his climate policies are good and they give **guys like me** a break. Oh, and my 401K looks real nice."
>
> - Interview with JD, Andover OH, Dec 6 2018

I highlighted the words "guys like me" above because they stand out as important to understanding why JD likes President Trump. JD is a registered Republican, a 35-year old white man with some college credits who works in a unionized job at the city water company. He is married with a wife and two young daughters, and lives in the village of Andover, Ohio, one of Ashtabula County's smallest communities. He is the image pundits conjure up when talking about the "white working class" in swing states: he voted for Democratic President Obama in 2008, Libertarian candidate Gary Johnson in 2012, and then Trump in 2016. The fact that Trump looks out for guys like JD draws a clear link between his white working class base and environmental policies, thus signifying the Trumpocene.

Of course, not all who voted for Trump did so because of his manufacturing policies. Some of these ways similarly reinforce white working class identity in the Trumpocene. A commonly cited reason for supporting President Trump was religious. Said one informant:

> "For me, I'm a single issue voter. Many people don't like that, but that's the way it is. My issue: abortion. If you are in favor of taking life, I will not support you as a candidate. We had two options in that election: one supported taking life and one supported saving it. I chose the candidate who saves lives. Some people say he's not a Christian man—that he's a bigot. I don't think he is. I think he's a nice fella'."
>
> - Interview with CH, North Kingsville OH, Mar 8 2019

Trumpocene thinking expands beyond just our perception of environmental relationality in troubling times. It also describes how we as humans think about our relationships with and responsibilities to each other. For this man, responsibility to the unborn is paramount. He does not observe the bigotry for which some decry Trump because, in his eyes, President Trump defends his values and outlook. The man cited his Catholic faith in describing his views regarding abortion. White working class identity is thus partly about conformity, an expectation that others will come to abide by religious codes inherited through European lineages.

The Trumpocene is a distinct imagined future from those discussed by Haraway. It is the aftermath of the Capitalocene, and the opposite of the Chthulucene. It is a framework in which neoliberalism comes to be the dominant paradigm changing the Earthly, rather than just humans or capitalism. The Trumpocene is an accepted vision for the future of many Ashtabulans who

identify as working class white because it aligns with their belief that industry is central to community. It is a vision for an environmental future produced and legitimated by chemopolitical actors, including Plant 2.

Conclusion: Dust to Dust

This chapter has interrogated the historical conditions under which white working class identity was molded through the twentieth century. From ethnographic interviews and observations with the residents of Ashtabula, I found that Ashtabula residents construct white racial identity through the lived experiences of work and family, in which the manufacture of TiO_2 plays an integral role. Residents accept industry as an inevitable and crucial part of life because it brings prosperity. Plant 2 has been successful in Ashtabula because it has made concessions that allow the community to perceive it as being a good steward of its land and workers.

White working class identity is chemopolitically centered around the production of TiO_2. Here, I have identified three features that demarcate the white working class as a distinct identity: 1) fluid identities in which ethnic differences are emphasized among the in-group (whites) and monoliths are reinforced when discussing "others"; 2) a belief that industrial prosperity is about finding balance between communities and manufacturers—but the terms and agenda of "balance" are set at the top, by industries and allies; and 3) a vision for the future that continues to include industrial sources of employment. Each of these is related to power because they either directly or indirectly serve the interests of chemical industries. By playing a leading role in setting the terms for industrial engagement in Ashtabula, Plant 2 reinforces this set of white working class values.

The reproduction of white values that constitutes efforts to enact the Trumpocene is a form of *raciontics*—racialized modes of practicing agency. Speaking in support of new manufacturing plants, voting for conservative politicians, and doing the honorable work of manufacturing are all ways for Ashtabula residents to practice raciontics. Being a part of the factory community is an important way of reproducing one's whiteness. White working class identity is not strictly chemosocial. I am not suggesting that Plant 2 is the only facility in Ashtabula responsible for reinforcing white identity. However, as the only major facility involved in the Fields Brook Superfund cleanup remaining, Plant 2 and Ineos have an outsized role in setting the terms of engagement. Plant 2 is one of the oldest facilities in the county still in operation. This longstanding historical legacy is a crucial factor in the cultural weight it carries in the minds of locals. Plant 2 plays a locally distinct role in manufacturing white identity through the chemopolitics that surround its continued production of TiO_2.

Chapter Eight: Hope and Cancer

Introduction: All About Hope

Throughout this dissertation, I have traced the meanings and memories that underly white working class identity in a town dominated by chemical factories. In this concluding chapter, I want to begin by comparing two quotes from the same day—December 15 2018—but different circumstances. The first came near the end of an interview with a local historian and journalist:

> RB: "What do you see for the future of Ashtabula?"
>
> CF: *pauses, then chuckles* "Honestly, not a whole lot. I think this town has lost all of its hope. You see the news about the opiates and all that. People in Ashtabula need hope. It's like that all across the Rust Belt. Our hope has been taken away when our economy left us behind. We need to give people hope again, especially young people like yourself."
>
> RB: "Why do you think that?"
>
> CF: "Because there isn't anything here. I've experienced it myself, being self-employed, not having health insurance these past few years. I think we need to give people something to aspire to, so that they don't become depressed like me. You need to give them work to earn a living."

Later on, when I returned home, I had the following exchange with Ann, a middle aged mother of three sons about my age who served as my host during my fieldwork:

> AC: "How was your interview today?"
>
> RB: "It went well. He was really knowledgeable and insightful. But, I can't stop thinking about the ending, when we talked about how Ashtabula needed hope. Everybody says that, it seems. It's all about hope, when I think what they really mean is industry."
>
> AC: *laughs darkly* "Yeah—hope and cancer!"

Taken together, these two quotes represent two broad camps of people living in Ashtabula into which most of my informants fall. The first informant welcomes industry, worshipping it as part of Ashtabula's industrial heritage. Industry promotes growth, and so to hope means to have access to security and prosperity. He has bought into the chemical logics that manufacture whiteness. Meanwhile, the second informant is industry skeptic. She has lost two immediate family members to cancer and has another who is presently fighting it. In this case, to hope means to aspire away from industry and the harm it brings. The prosperity of industry is juxtaposed with the horrors of a mutagenic illness. Throughout this dissertation, I have presented examples of this opposition: from the cognitive dissonances in my informants' recollections of the past (Chapters 3 & 4), to the tensions between activists and workers at Fields Brook (Chapters 5 & 6), to the debate over continued industrial presence today (Chapter 7). In each case I have shown that small town industries are fluid assemblages, where locals constantly reproduce and contest ideas about identity and belonging.

This chapter is an attempt to look ahead to the future, at an Ashtabula that could be, as opposed to the Ashtabula that was. To many of my informants, the future ought to look more like the past; to many others, it should be something completely different. In order to capture these visions for the future, I employed a relatively novel ethnographic method called participatory community art. The goal of this method was to capture images of industrial landscapes related to Fields Brook Superfund Site, then present the images to Ashtabula residents for feedback. My hope was that showing the site to people in Ashtabula firsthand would help them develop a firsthand connection with it that might motivate them to want to learn more about contamination around them. I first review the main findings of this dissertation, providing a template for a discussion of applied dimensions. I then detail the theory and methodology that underlies this endeavor, then explain how I went about implementing it for this dissertation. I describe in narrative form the process of creating a PCA of Fields Brook with a collaborating photographer. The next section describes some of the findings of the photo-ethnography's presentation to the public. In concluding, I propose recommendations for how Ashtabula can continue to engage its citizens in the important work of democratizing its Superfunds.

Summary of Main Findings

In this dissertation I proposed that chemo-ethnography (Shapiro & Kirksey 2017) is a new mode of doing anthropology that confronts the challenges posed by late industrialism. My study is informed by a large and ever-growing body of work in anthropology on environmental justice, risk, and toxicity. More-than-human perspectives are a necessary new direction in environmental justice scholarship that emphasizes the unique agency of chemicals in shaping industrial life. I have argued that interactions with chemicals in an industrial town formulate

chemosocialities, or ways of living structured around chemical experiences. These can take various forms, from embodied sensorialities to participation in chemical political economies.

Throughout my discussions of particular chemosocialities, I have found answers to the three major research questions I outlined in chapter one. In asking, *what are the more-than-human assemblages that constitute Fields Brook?,* I adopted a unique approach to studying Superfund Sites that emphasized relationality and the transformative power of collaboration. I found that Fields Brook is an assemblage of various chemicals, technologies, memories, discourses, organisms, ontologies, practices, laws, experiences, and materials. In addition to the physical matter that makes up the Superfund, it is also the product of intense human and nonhuman interactions. Fields Brook is discursively constructed in the local imaginary and in EPA documents. This assemblage is fluid and interchangeable, with different chemical constituents holding specific roles at times that they give up at others. Within the assemblage, morality is relative: it is impossible to assign either purely good or bad moral value to actors in the Brook. To be an assemblage means to always be becoming through interactions.

In asking, *what are the embodied experiences of people living and working in and near Fields Brook?,* I turned my attention to translations between sensorial experience and ontics, seeking to understand the connection between an individual's positionality within the Fields Brook assemblage and their efforts to move about in the world. I found that people experienced Fields Brook sensorially, through the sights, smells, and touches that the brook and its chemical tributaries had to offer. Even people who had not interacted with the brook directly told stories that called into question whether they had somehow been contaminated by the chemicals in it. The prevalence of various unexplained illnesses in Ashtabula County causes many to at least pause and question whether the landscape's industrial heritage could have something to do with

it. Moreover, the environmental injuries wrought by toxic environments becomes the foundation of a plighted citizenship (Benson 2011) for some, motivating resentful feelings that ground white working class identities.

In asking, *what environmental futures are possible for Fields Brook?*, I was curious to learn how the people of Ashtabula believe the brook should be managed, what it should look like, and who should have control. I found that for many Ashtabula residents, it was difficult to envision a future for the brook that did not involve continued industrialization. Plant 2, the last bastion of good-paying factory jobs in the area, is fiercely protected as a source of local pride. Some want an alternative, and take actions to make a different future possible, but feel stifled as they try to swim against political currents. Others who would desire or at least be open to an alternative to industry are unsure and therefore resign to apathy over the subject. The largest and most vocal faction strongly support continued industrial development. They view it as essential for local prosperity. They take issue with dissenters and perceive inquiries as threats. This is a view I called a "Trumpocene raciontic," a particular way of living in postindustrial times that doubles down on industry as a source of white identity performance.

Together, these three research questions point to a broader one: What does it mean to be a white working class person in a capitalist ruin? I have found the answer to this question depends on whom you talk to. Many scholars and pundits might point to the stereotypical Ashtabulan: a rural resenter, a "Trumper," a white working class conservative. I did indeed meet many people like this, who founded their identity on the aggressive pursuit of manufacturing industries as a source of white pride. But I also met many progressive-minded folks who wanted peace, equality, and environmental protection for their community. White working classness in either regard is about dissent and alienation: there is a sense regardless of where people are on the

political spectrum that they have been left behind. How people respond differs dramatically, and will set the stage for coming conflicts within our democracy. For all of the talk about the 2016 election, 2020 runs directly through Ashtabula and places like it. Recognizing the lived experience of white working classness as driven by deindustrialization and forged in chemosocial encounters is paramount.

As Rosa & Bonilla (2017) have argued, anthropologists must do much more to engage critical and ongoing questions about the nature of deindustrialization, the ethics of intercultural contact, and the challenges posed by insurgent populism. To do this, we need more chemo-ethnographies that study the assemblages, lived experiences, and imagined futures of the white working class and other marginalized populations. But theorizing this is not enough; we must also act. How can anthropologists approach applying chemo-ethnography to solving complex problems associated with democracy? I argue that continuing to engage publics in meaningful conversations that elevate different voices is a necessary start.

Participatory Community Art as Engaged Anthropology

In this dissertation, I utilized participatory community art as a form of applied anthropology. Participatory community art (Leavy 2017), or "participatory art-making" (Lewis 2013), is a visual ethnographic method that engages publics in creating artistic representations of a cultural phenomenon. Matarasso (2019) traces the development of this mode of art-making to a relatively recent synthesis of participatory art—which he defines as "the whole field of collaborative arts work… where artists involve the public in making art"—and community art—which he calls "a radical rights-based approach to participation in art characterized by a critical social engagement." Participatory community art, or PCA, is then a collaborative form of art-

making where artists involve a disenfranchised public in creating representations that liberate and empower (Stickley 2011; Bala 2018; Sztabinska 2018; Nelson & Keifer-Boyd 2019).

PCA is an emerging methodology, and thus much of the research using this method is recent and outside the canon of anthropology. The uses of PCA are multifarious but include youth interventions (Lee et al. 2020; Furman et al. 2019), mental health recovery (Bone 2018; Bang 2015; Lewis & Spandler 2019; Fletcher et al. 2019), collaborative community planning (Pollock & Sharp 2012; Carey & Sutton 2004), and environmental/conservation education (Song 2009; Johansson & Isgren 2017). PCA provides a way for people to represent their lived experiences in ways that simultaneously give scholars new insights (Hogan 2015) while being a tool for transitional justice among marginalized groups, who use the method as way to tell their stories (Shefik 2018).

The novel synthesis of participatory and community art PCA presents anthropologists with two opportunities. First, PCA as a form of participatory action research reaffirms anthropological commitment to activism. Art is a form of representation that anthropologists have long recognized as political (Ginsburg 1997; Checker & Fishman 2004; Fishman 2004; El Ghadban 2009). According to Charles Hale (2001, 2008), activist anthropology is defined by its ability to empower subjects at all stages of the research process so that they may insert their experiences into academic discourse. Control over self-representation is critical. Given that PCA's goals of representational justice and community inclusion, it fits neatly within this activist anthropological tradition. Like other visual methods, such as photovoice, PCA empowers marginalized groups through self-constructed images of their lived experience (Wang & Burris 1997; Wang 2009).

Second, PCA provides anthropologists a chance to reaffirm key commitments to holism and relativism. PCA implores collaborations that blur the lines between science, humanism, and art. It is necessarily interdisciplinary, allowing anthropologists to capture a mode of representation that may otherwise go ignored. PCA gives ethnographers a tool we can use to engage communities in something that is livelier and more interesting than the standard ethnographic interview. The ultimate representations created through PCA are an accessible means of conveying our research to publics, as well. This is a critical point for a discipline which frequently laments its absence from public discourses or imaginations.

Learning Together: Doing PCA of Fields Brook

To do PCA of Fields Brook, I collaborated with Ryan Cook, a 24-year old photographer and musician from Ashtabula. Ryan is the younger brother of my high school friend Jarred; his family acted as my hosts throughout most of my fieldwork. I first approached Ryan on Christmas Day 2018 with the idea after seeing his father Blake—also an artist—working on a post-industrial documentary project for a friend. Drawing inspiration from anthropological works such as Christine Walley's Documentary *Exit Zero* and Eben Kirksey's Multispecies Salon, I sought to create a representation of more-than-human, postindustrial life that would inspire Ashtabula residents to learn more about our community's complicated historical relationship with manufacturing.

We agreed that the project would focus on creating photographic representations of Fields Brook Superfund Site. I would use information acquired from observations, interviews, and archival research to inform Ryan's selection of photographic subjects. We spent several hours on the phone and in the Cook family dining room marking maps and identifying important

spots to photograph. The most important places were the ones most frequently mentioned by informants, such as the coal docks, the railroad, and the portion of the Brook that was formerly part of the Ashtabula golf course.

On March 13 2019, as the ground was beginning to thaw from winter, Ryan and I set out on a photographic journey along Fields Brook. We left at 10am and headed first to the Ashtabula Harbor, near where Fields Brook empties into the Ashtabula River. The idea was to move upstream, from the end of Fields Brook up to the beginning, tracing the pollutants as we went. Ryan began by photographing what remains of Ashtabula's coal docks and railyards, which sit just a few hundred yards north of prominent restaurants and shops. At several points along this journey, we found ourselves flagrantly violating NO TRESPASSING signs that had been posted. A few times I allowed Ryan to go ahead into more precarious spots to gain "the perfect shot." My job as the anthropologist was to observe (and at times partially direct) his art-making process, not exert control over it.

Figure 8.1: Coal chutes (seen above) were used to move coal from ships where it was delivered to railroad cars that would stack it. Photo by Ryan Cook.

After photographing the terminus, we drove upstream to where Fields Brook passes through several east side neighborhoods. The official terminus of Fields Brook is right by the Ashtabula Yacht Club, at the end of East 5th street. As we drove past the homes, Ryan and I had the following exchange:

RC: "I can't see the Brook. Where is it?"

RB: "It's on private property in this neighborhood. It runs through the back yards of all those houses."

RC: "Wait… so the chemicals they dumped into the brook flow through there too?"

RB: "Yep."

RC: "Wow. That's fucked up."

Figure 8.2: Fields Brook runs through numerous private properties in residential Ashtabula. Photo by Ryan Cook.

We walked along a public section of residential Fields Brook while I told Ryan some of the stories informants had shared with me. I recalled the tales of young children who skipped rocks to turn the water colors, the teenagers who used to skinny dip in the brook on warm summer nights, and the people who held their noses driving to work. Like me, Ryan had also grown up in Ashtabula, and was interested in the industrial legacy, but had been mostly unaware of the full scope of pollution that had affected our shared community in the past. Ryan was a step further removed than I. While my mother had also grown up in Ashtabula, endowing me with a wide family network in the county, Ryan's family had moved to Ashtabula when he and his brothers were in elementary school. He wondered aloud if his parents would have made the decision again if they had known about Fields Brook.

Further upstream, Fields Brook crosses under OH-11 before flowing through residential neighborhoods. We took a break to drive up the highway to Sheetz for a quick lunch. As we sat in my car eating our gas station nachos, I explained to Ryan that before OH-11 existed, that area had been a large field. "Is that why it's called Fields Brook?" he asked, to which I responded that I was unsure. Throughout my research, I was unable to locate the exact origin of Fields Brook's name. Nobody remembered when it had started being called that. But, I told him, that seemed like a possible, if simple, explanation.

We finished our lunch and hopped back on OH-11, exiting at East 21st street, by the former RMI plant. I parked my car on the concrete just outside of the gates that read "NO TRESPASSING."

Figure 8.3: The abandoned RMI uranium extrusion facility property. Photo by Ryan Cook.

> RC: "This place looks abandoned. What used to be here?"
>
> RB: "This was a uranium extrusion plant. They worked with depleted uranium leftover from the nuclear program. They produced nuclear cores used for submarines, and according to some people, uranium bullets."
>
> RC: *long pause* "Wow. So the government did this too, not just companies."

Ryan's response embodies the mistrust in government and corporations that I observed countless times throughout my research. He took a variety of photographs of the gates, the still-standing buildings, and the vacant lot beyond the fence. We both observed a sign that instructed

that no diesel fuel be allowed on the premises—Ryan asked why this was, to which I honestly responded that I had no idea.

Next, we drove around the corner, to State Road. As we drove down 21st and came to State Road to turn left, we observed two large concrete blocks on either side of the driveway to the old Acme property. The blocks were spray painted with the names "Kevin" and "Chris." "You see those guys' names everywhere around town," Ryan informed me. After turning left and driving a few hundred feet north, I pulled off along the side of State Road across the street from Ineos Plant 2 and Detrex Chemicals. I had parked a few feet away from the bridge over Fields Brook. "Okay," I told Ryan. "This is why I told you to wear boots and long pants."

We walked down the muddy slope toward the brook. It was a relatively warm day in early March, about 50 degrees, so I slung my sweatshirt over my shoulder. The ground was damp with the thawing frosts of winter. As we walked along the banks of Fields Brook behind RMI's property, I explained that this area had once been a beloved golf course. I pointed to areas of the water where modifications were visible, such as sections that had been lined with stone to weigh down plastic tarp underneath. Ryan dutifully photographed these. Walking along the south edge, we eventually came to a rusted chain linked fence, with a "NO TRESPASSING" sign on the front. To our left, we observed the sloped land running down from RMI's property, and took note of the water flowing downhill and toward the brook.

We headed back to the bridge—the same one where the Greenpeace protests had taken place—and crossed over to walk along the north edge of Fields Brook. On the north end, we noticed that there were tire tracks all over, and I hypothesized that they must have been from construction equipment during the engineering of the brook. We also observed several monitoring wells, marked by yellow flags. We walked along the brook, through bramble and

mud, until we eventually reached a bank that could not be navigated on foot, then were forced to turn back.

When we got back to my car, Ryan asked me about the scope of the engineering project:

RC: “So… they had all this construction equipment, right? What did they do with it?”

RB: “They dug up the contaminated soil and sediment, and dredged the water. They incinerated the soil into ash and reburied it in landfills.”

RC: “Where are the landfills located?”

RB: “I’ll show you.”

Figure 8.4: Segment of Fields Brook between State Road and OH-11. Photo by Ryan Cook.

We hopped in my car and drove a quarter mile north along State Road, until we came to the State Road Medical building. This facility is an occupational medicine facility that serves many of the factories in and around Fields Brook. It was also formerly part of RMI's sodium plant. I pulled into the parking lot and parked my car toward the back, near a long chain link fence. The fence, like so many in this tale, had signs posted that read "NO TRESPASSING—HAZARDOUS MATERIALS CONTAINED WITHIN." At the bottom of the fence, there were ditches lined with tarp and stones. Beyond, the raised earth indicated that this was a landfill—the same one where the EPA had buried dredged and incinerated soil, sediment, and water from Fields Brook and the Ashtabula River.

By this point in the afternoon, after more than five hours of exploring these sites, Ryan was growing incredulous. "I can't believe they did this," he said. "It just shows that companies can do whatever they want, and we can't do anything about it." His pessimism quickly turned into resolution: "I can't wait to share this with the world and expose these bastards."

"There's one more place I want you to see before we're done." We hopped back into my car and left—only this time, we drove back south, and turned left, heading east a few miles down Middle Road. Eventually, we came to the property of one of Fields Brook's lesser known PRPs, Reserve Environmental Services (RES). We drove toward the main gate, only to find that the property seemed completely abandoned. We observed rusty smokestacks, and no cars were in the parking lot. There was a piece of paper taped over the intercom used to buzz into the gate, but the text had faded away. We noticed a security camera taped to a nearby tree, with a light on indicating that this, at least, was still active.

"Is this place abandoned? What was it?" Ryan asked me. I responded that RES was an environmental hazard management company, and that they had been responsible for disposing

some of the wastes from Fields Brook after the cleanup. We got back in my car and drove a few hundred feet further down Middle Road, to RES's landfills: large mounds of raised earth, blocked—as always—by chain link fences. We could see ditches dug around some of the landfills, with water pumps left abandoned around the property.

"How did they dispose the wastes?" Ryan asked.

I took a moment, then choked when I started to respond. "I… they incinerated it. Then they buried it underground. Some of the water is kept in retention ponds that are lined to prevent groundwater seepage. And when they used to burn it, they would sometimes do it at night, so that they could release it without being caught."

"How do you know that?"

Figure 8.5: Me looking into one of RES's dumps, one mile from my childhood home. Photo by Ryan Cook.

"Because," I said. "I grew up just down the road." From here, Sill Road, the street I had grown up on, was visible. I pointed to it, and told Ryan that I lived in the house at the top of the hill. I told him about the morning I woke up to find the ground covered in ash.

"So that's why you're doing this project," Ryan said.

"Yes," I responded. "That's why."

Presenting a Photo-Ethnography of Fields Brook

After completing the photoshoot, the next step for Ryan and I was to figure out how to get them to the public. We discussed several options, including creating a documentary for release, publishing them to a website, and trying to find a museum to display them. Eventually, the perfect opportunity presented itself: the Ashtabula County District Library posted an advertisement for an "Artist of the Month" series throughout 2019. The program was being run by my longtime high school friend, Diadem. I contacted Diadem and arranged to have the exhibit run in August 2019. We believed that this was the perfect place to hold the exhibit because the ACDL reference section is also where public records on Fields Brook are kept. People could view the photographs and immediately access more information if they wanted to learn more.

Ryan and I selected four of what we considered the most impactful photographs of Fields Brook, along with ten photographs we had taken of Ashtabula County's four other Superfund Sites in June 2019. We printed and framed the photographs, the cost of which was covered by a grant I received from the USF Department of Anthropology. I wrote a few sentences about each photograph to accompany the exhibit. ACDL hosted the exhibit in the library's reading room for six weeks from the beginning of August until mid-September, during which time people could

enter the library and view it free of charge. We left a comment box, asking patrons to share their experiences with Fields Brook and what they think should be done about it.

Five people who viewed the exhibit left comment cards. Their thoughts are as follows:

> "Even if some of the bldgs are closed they should have panels on the site detailing history of company and chemicals. Even though neg/bad, still history!"

> "Lloyd & Helen M—of Miller Road, New Lyme both died of cancer in their fifties due to gas leakage in their drinking water. Their youngest son Brian also died in his forties." [Last names have been removed to protect identities]

> "I am very concerned that I've lived in Ashtabula most of my life and never knew how serious the industrial pollution was. The secrecy surrounding it is alarming, especially the RMI plant."

> "Yes—Headed up the citizens committee for the Geneva dump site cleanup—site is now fenced in." [This individual also left an email address to contact]

> "Personally, I've always stayed away from the Superfund Sites. However, I had an uncle who developed cancer from which he believed stemmed from playing in Fields Brook as a child in the 50's & 60's. I think the site could be great for solar farms or wind farms (or both)."

A few people who viewed the exhibit contacted me directly to express their thoughts. Two informants with whom I am Facebook friends reached out with public comments on my timeline:

> "I never knew where Fields Brook emptied into the Ashtabula River until about 4 months ago when I was watching trains in the Harbor and happened upon a road going to a boat club on the east side of the river. Coincidently, there was a stream running parallel to the river and I put 2+2 together. Your photo is exactly what I saw. BTW, great exhibit at the library."

> "I made it to the Library to see the marvelous exhibit. You are so accomplished and have put your heart and soul into this project. Thank you for your hard work and dedication."

From these seven comments, we can observe two things. First, there is a shared belief among those who viewed the exhibit that the story of Fields Brook is important. They believe it is an important part of Ashtabula's history that needs to be represented. Second, there is a shared sense of concern among the commenters. Especially in the written comment cards, it appears the photographs evoked fear or dread, cause people to worry about problems they may not have thought about previously. The intersection of value placed on this story and the fear it evokes motivates at least one commenter to believe that even more must be done to continue educating the public about Superfunds.

In mid-August, I also received an unexpected phone call from one of the Ashtabula County Commissioners I had interviewed for the project. This commissioner had called to congratulate me on reaching the end of the project. "Not quite the end, but a milestone at least," I corrected. I took this opportunity to talk to the commissioner more about the Superfund redevelopment, especially earlier news reports that the board was considering turning portions of Fields Brook into a farm for solar panels. The commissioner gave this lengthy response:

> "That's a great idea, and it's one that we have considered. We actually had a feasibility assessment done to see if any of the five sites would be good candidates. Unfortunately, they all have different problems that make them unsuitable. Fields Brook, as an example, is probably the most complicated, because it's not just one property, but it is an entire watershed, and then you have the added layer of multiple brownfields within that watershed, too. The Laskin-Oil site in Jefferson—we wanted to pave that and turn it into parking for the fairgrounds, but we were told by the EPA that doing so could stir up contaminants in the soil. The New Lyme landfill was never fully cleaned up, so anyone who wants to develop there would have to accept a lot of financial responsibilities. Big D Campground has been largely cleaned up, but it's so isolated that in order to develop anything there you would need new power lines, sewer lines, and all of that… So basically, what I'm saying is, it is really hard to do any sort of redevelopment of these sites, for different reasons, whether they be financial, technical, or health related.

The commissioner's comments expose one of the central problems with Superfund redevelopment, especially in a rural area such as Ashtabula County. There is little, if any, incentive to do anything with the sites beyond the minimum required cleanup and mitigation. Their isolation allows them simply to be rendered invisible, forgotten and unseen. The risks associated with redeveloping them are too great: any entity who wished to take over the properties would have to accept liability for what might happen if people were inadvertently exposed to contaminants contained in the water or soil. And the costs with redeveloping the sites to make them usable vary widely and are very steep. Why would a firm owner choose to redevelop these properties when Ashtabula County remains replete with unused land?

At the exhibit's conclusion, I arranged to have six of the portraits shipped to my home in Tampa, Florida, while I donated the remaining six. One photograph each was donated to ACDL and smaller libraries in Kingsville, Rock Creek, Orwell, and Jefferson, where the other four Superfunds are located. I donated the final portrait to the Ashtabula Maritime & Surface Transportation Museum. By distributing the photographs throughout the community, I aimed to ensure that they would remain visible and could continue to stimulate the interests and memories of curious residents. Finally, I created a website using Google pages to share the photographs online.

Recommendations for a New Future

Based on my research, including the PCA component completed in September, I have developed a set of recommendations for what can be done to better engage the Ashtabula community in remembering and protecting our environmental heritage. These four recommendations are as follows:

1. Seek funding through a grant providing agency such as the Appalachian Regional Commission to develop a cultural heritage education-based "toxic tour" of Ashtabula County. Funding would provide for monuments, murals, or other landmarks to be placed at each Superfund Site. Residents can take informal driving tours to visit each site and learn more about the history and consequences of each Superfund.

2. Work with county libraries to increase public awareness of the Superfund Sites. All of the libraries from whom I requested this information indicated that I was the first to ever do so, and many informants I spoke with were not aware this information was publicly available.

3. Begin a collaborative partnership between Growth Partnership, Leadership, CAP, and county government to better engage citizens in industry decision-making and economic development throughout Ashtabula County. At present, there is a sense among many that Growth Partnership sides with business over the community. To shift this perception, there needs to be more direct engagement with community stakeholders that places the conversation on their terms.

4. Open up the public relations wings of companies such as Ineos to provide "toxic tours" of Fields Brook's cleanup to members of the community. Members of CAP have already done similar events to allow the community to learn more about their environmental efforts. Increased advertising of these events would help more community members understand and trust the industries. This could also provide networking opportunities that could lead to hiring for both needy employees and employers.

I recognize that these recommendations may not be the ideal solution for each of the stakeholders involved in this project, nor may they be feasible in all cases. Regardless, they are meant to serve as suggestions to catalyze further discussion and deliberation among the community. Furthermore, as Phaedra Pezzullo (2007) points out, toxic tourism discourses must be approached carefully so as to avoid spectacularizing the plight of environmental injustice. This is especially important with regards to Ashtabula because white working classness nobility is intricately coupled with factory work: the very words "toxic tour" insult the honor code of white working class culture by recasting hard workers as plighted citizens.

Moreover, if these first steps can be accomplished, it may eventually lead to wider cultural or ontological changes among the community that facilitate new futures. Perhaps by learning more about industry, the people of Ashtabula will decide to pursue an alternative future and emphasize attracting different economic firms than manufacturers. Or, it might inspire activists and concerned groups to collect funds and start the requisite partnerships needed to redevelop one or more Superfund. In order to actuate large-scale change, community leaders and members in Ashtabula must be willing to take the first step.

Conclusion: Water Under the Bridge

In this dissertation, I have traced the assemblages, experiences, and responses that comprise what we know as Fields Brook Superfund Site. I found that the Superfund is an amalgamation of chemicals, ecology, human activities, and memories that still exerts considerable influence on Ashtabula's cultural identity today. I learned that some of the identity markers of whiteness, such as acquiescence to industrial domination, are chemosocialities that emerge from experiences with particular chemicals.

The broad body of anthropological and other social scientific work on environmental justice benefits from a more-than-human perspective. By emphasizing futurity rather than historicity, as most other environmental justice scholars do, I have differentiated my analysis as having practical applications to policy at the local, state, and national levels. This chemo-ethnography of Fields Brook could prove useful to anthropologists, policymakers, industries, concerned citizens, and others who hope to make Ashtabula a better place to live.

The United States, like Ashtabula, remains deeply divided around existential problems including environmental change, economic growth, racial divisions, and class antagonism. The "white working class" population that inhabits much of Ashtabula is at the center of a national conversation about what—if anything—should be done to solve these problems. Here, I have shown that chemosocial encounters with factories underly some of these logics. These are translatable and transferable findings to countless other communities like Ashtabula across not only the United States, but also the U.K., France, Germany, and other deindustrializing nations.

PCA is an emerging ethnographic method that is uniquely positioned to help anthropologists study and solve these problems. By presenting self-conscious representations of environmental contamination in local communities, people can become aware of and organize against contamination legacies. They can begin to build alternative visions for the future that they enact through leadership and political participation. As different perceptions are articulated, the discourse of solving pollution becomes more collaborative and communal. PCA is an important mode of representing the more-than-human—of capturing visions of environmental injustice affecting and affected by humans and nonhumans alike. Using PCA as engaged chemo-ethnography promises to open the door to a participatory, collaborative anthropology that is relevant to subject communities. The representations created by PCA are a vital step in giving

people who have been subjected to Superfund contamination a voice in discovering and making sense of their experiences.

Epilogue: Along Lake Erie

I loaded the last suitcase into the trunk of my black Nissan Altima. It was a warm, sunny day in June—one of the nicest in the month or so I had been in Ashtabula for this last leg of fieldwork. Much of May and June had been cloudy, cool, and rainy. Ohio had suffered through one of the wettest springs in history, resulting in a loss of more than half its annual soy and corn harvests due to soil saturation. Meteorologists were attributing it to climate change.

After I packed the suitcase in, I shut the trunk door and went back inside the house, pulling the screen door shut behind me and past the jam for probably the last time. I walked over to Charlie—the family's chocolate lab—and gave him a pet.

"Alright!" I called out. "I'm heading to Columbus!"

Blake and Ann came from their respective rooms to meet me and say goodbye. Jarred, Ryan, and Ezra were not home, but I had said my goodbyes to each of them in the prior days.

"Thank you both again for everything. I owe you more than I can say."

"It's no problem at all. You've always been such a good friend to Jarred. And sometimes, you do things just because it's the right thing to do. This was one."

I gave Blake and Ann each a hug. As I hugged Ann goodbye, she told me to be sure to come back and visit next time I am in town.

"Absolutely," I replied. "But I don't know when I'll be back again."

"Don't worry. You'll come back."

"Yeah," I said. "You're right. I will."

With a slight tear in my eye, I patted Charlie one last time, said goodbye, and walked out the door. I sat in my car and prepared myself for the first leg of my journey: Ashtabula to Columbus, approximately 200 miles of solo driving. I backed out of the driveway, shifted my car into “drive,” and took off down Conley Road. With my windows open, I took in the warm, spring air, replete with the odors of a warming lake and various flowering trees.

In the distance, I could see smoke billowing from the factory smokestacks along Lake Erie.

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Appendix A: IRB Approval Letter

RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799
(813) 974-5638 • FAX (813) 974-7091

October 23, 2018

Richard Bargielski
Anthropology
4202 E Fowler Ave
SOC 15C
Tampa, FL 33620

RE: **Expedited Approval for Initial Review**
IRB#: Pro00037118
Title: A Chemo-Ethnography of Fields Brook Superfund Site in Ashtabula County, Ohio

Study Approval Period: 10/23/2018 to 10/23/2019

Dear Mr. Bargielski:

On 10/23/2018, the Institutional Review Board (IRB) reviewed and **APPROVED** the above application and all documents contained within, including those outlined below.

Approved Item(s):
Protocol Document(s):
Fields Brook Protocol Version 1 10.17
Consent/Assent Document(s)*:
Fields Brook Consent Version 1 10.17.docx.pdf
Fields Brook Electronic Consent V1 10.15
Fields Brook Paper Consent V1 10.15
Fields Brook Verbal Consent (For EPA Employees) V1 10.17

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consent/assent documents are valid until the consent document is amended and approved. Forms that do not obtain a signature are not stamped.
It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research

through the expedited review procedure authorized by 45CFR46.110. The research proposed in this study is categorized under the following expedited review category:

(6) Collection of data from voice, video, digital, or image recordings made for research purposes.

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Your study qualifies for a waiver of the requirements for the documentation of informed consent as outlined in the federal regulations at 45CFR46.117(c) which states that an IRB may waive the requirement for the investigator to obtain a signed consent form for some or all subjects if it finds either: (1) That the only record linking the subject and the research would be the consent document and the principal risk would be potential harm resulting from a breach of confidentiality. Each subject will be asked whether the subject wants documentation linking the subject with the research, and the subject's wishes will govern; or (2) That the research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required outside of the research context. (Online Consent, Paper Survey Consent, and EPA Verbal Consent)

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval via an amendment. Additionally, all unanticipated problems must be reported to the USF IRB within five (5) business days.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

Kristen Salomon, Ph.D., Chairperson
USF Institutional Review Board