Ethnographic movement methods: anthropology takes on the pesticide industry

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Abstract

In this article, I describe how the methods of anthropology proved productive and fruitful for research and environmental justice (EJ) activism against methyl iodide, a highly toxic soil fumigant pesticide used to sterilize soil before food crops like strawberries are transplanted. I continue a thread of discussion around what roles anthropology, and especially, public and applied anthropology, should play in addressing the serious problems traditionally encountered, documented, analyzed, and theorized through ethnographic research. Anthropological engagement and action on methyl iodide and other soil fumigants produced unique research opportunities and networks up and down the agricultural hierarchy, as well as spaces to contribute ethnographic labor and critical analysis and reflection to the EJ movement. While this activist approach—what I refer to as 'ethnographic movement methods'—presented some challenges, the victorious end-result of having methyl iodide's manufacturer pull their product from the U.S. market in 2012 also demonstrated how anthropologists, in cooperation with communities confronted by environmental suffering, can work cooperatively towards alternative agricultural and ecological futures.

Keywords: activism; applied anthropology; environmental justice; farmworkers; ethnographic movement methods; pesticides

Résume

Dans cet article, je décris comment les méthodes de l'anthropologie ont été productives et fructueuses pour la recherche et l'activisme sur la justice environnementale (JE) contre l'iodométhane, un pesticide fumigant de sol hautement toxique utilisé pour stériliser le sol avant les cultures vivrières comme les fraises sont transplantés. Je continue un fil de discussion sur les rôles que l'anthropologie, et surtout, l'anthropologie public et l'anthropologie appliquée, devrait jouer dans la lutte contre les graves problèmes rencontrés traditionnellement, documentés, analysés, et théorisé par la recherche ethnographique. L'engagement anthropologique et l'action sur l'iodométhane et d'autres fumigants produites possibilités uniques de recherche et des réseaux le long de la hiérarchie agricole, ainsi que des espaces de contribuer le travail ethnographique et d'analyse critique et de réflexion pour le mouvement JE. Alors que ce militant approche-ce que je me réfère à des «méthodes de mouvement ethnographique» - était difficile, la victoire d'avoir le fabricant de l'iodométhane tirer leur produit sur le marché américain en 2012 a également démontré comment les anthropologues, en coopération avec les communautés confrontées à la souffrance de l'environnement, peut travailler en collaboration pour soutenir un avenir pour l'agriculture et l'écologie alternative.

Mots-clés: l'activisme; anthropologie appliquée; justice environnementale; travailleurs agricoles; méthodes ethnographiques de mouvement; pesticides

Resumen

En éste artículo, describo cómo las metodologías antropológicas apoyaban investigaciones y activísmo acerca de la justicia medioambiental en contradel yoduro de metilo, un fumigante muy venenoso que se utiliza para esterilizar la tierra antes de sembrar cultivos como la fresa. Desarollo un diálogo sobre el papel que la antropología -en particular la antropología pública y aplicada -deberia tener en resolver los problemas que los

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antropologos típicamente encuentran, documentan, analizan.. El involucramiento y acción antropológico sobre el yoduro de metilo y otros fumigantes del suelo presentaba oportunidades excepcionales para hacer investigaciones y para contribuir labores etnográficos y analíticos sobre un movimiento de justicia medioambiental, a través de contactos con actores en todas partes del sector agrícola.. Mientras que éste enfoque activísta—que nombro "métodos etnográficos de movimiento"—presentó algunos retos, se logró una victoria importante cuando el fabricante del yoduro de metilo retiró su producto del mercado estadounidense en el año 2012. Ésta victoria histórica demuestra que los antropólogos, trabajando en cooperación con las comunidades afectadas por el suframiento medioambiental, pueden ayudar a conseguir futuros ecológicos y agrícolas alternativas.

Palabras claves: activísmo, antropología aplicada, justicia medioambiental, trabajadores agrícolas, métodos etnográficos de movimiento, pesticidas

1. Introduction

I entered a small industrial warehouse space where the smells of smoldering sage and copal hung in the air, where murals of figures with brown fists held high and Aztec-themed artwork decked the walls inside and out, and where bicycle rims and tubes hung from the ceiling. Upon first arriving in the Pájaro Valley (Figure 1) in the summer of 2010, finding "hidden farmworkers" (Holmes 2013; Mitchell 1996) required that I engage with a number of different communities. One of these was the Watsonville Brown Berets, a group of young Chicano and Mexican activists, many of whom are children and grandchildren of farmworkers and some of whom do farm work jobs themselves to make ends meet, to support sick and elderly relatives, or to fund their college educations. In addition to seeking participants for my research, I also sought a community to foster my own health and wellbeing as I adapted to a new place.

The farmworkers I eventually met, spent time, and worked with are structurally vulnerable in a number of ways, which perpetuate and exacerbate their hiddenness (Quesada, Hart and Bourgois 2011). For instance, many farmworkers are undocumented, with estimates ranging and varying regionally across the U.S. from around 50 to 90 percent (Minkoff-Zern and Getz 2011; NAWS 2010). At least thirty percent of all farmworkers in California are Indigenous language speakers from some of the poorest states in Mexico, such as Oaxaca. Some speak Indigenous languages like Mixtec, Zapotec, or Triqui and struggle with Spanish as a second language (López 2011; Indigenous Farmworker Study 2010). Many of the farmworkers I met lived as families of diverse composition, ranging from single mothers and children, to groups of siblings who had migrated together to support older, sick, or injured kin in Mexico, to entire extended families of three of four generations of actively employed farmworkers. Both men and women ranging in age from 13 to 70 worked in the fields. Almost all of the farmworkers I met lived in overcrowded, substandard, and horrendously overpriced housing. These served as important observational indices of the overwhelming poverty farmworkers endure. Many are paid at a piece rate or at minimum wage for about six months a year during the strawberry-harvesting season. This is nowhere near enough to support an individual, let alone a family on California's Central Coast, where the cost of living is on par with some of the largest and most expensive cities in the U.S. For example, it is not unheard of to pay at least $1000 a month for a bedroom in a single family home or small studio apartment.

What did the Watsonville Brown Berets, let alone farmworkers, need from me, a white woman from Pennsylvania on her path to a PhD? As Checker observed during her fieldwork with African-American environmental justice organizers in Georgia, "people don't always need an anthropologist", but often do need other things: tutors, mentors, rides, graphic and web designers, list serve managers, grant and press writers, and volunteers to set up tables, collect signatures, or clean up after events" (2005: 193). Sometimes, they also need listeners. Checker conceptualizes these gestures as a form of reciprocity, a way for the anthropologist to give back to the people who have given their time to the research.

The Berets ended up turning my request for help and connections on its head. In other words, I was "hailed" (Wilson Gilmore 2008) by the group to direct my anthropological attention and later my action to soil fumigant pesticides. A few weeks after my initial visit with them, a young member, Joaquin, asked if I could help with the group's efforts in the campaign against methyl iodide, a highly toxic soil fumigant pesticide used to sterilize the soil, killing all pests from rodents to nematodes, prior to transplanting crops.

Fumigants are also employed to kill pests on harvested products before they are imported or exported. Science and public health data as well as anecdotal observations from communities where agricultural pesticide use is high demonstrate a number of chronic, detrimental, and potentially deadly health effects linked to soil fumigants (ATSDR 1992; Gemmill *et al*. 2013). This includes methyl iodide, which is carcinogenic, and toxic to the respiratory, neurological, endocrine, and reproductive systems and may cause miscarriages and developmental defects *in utero* (Froines *et al*. 2013). Methyl iodide was especially of interest to growers of strawberries, lettuce, and raspberries and blackberries, which dominate the landscapes of the Pájaro Valley. The previous fumigant of choice, methyl bromide, is, as of this writing, in the process of being phased out of use and production due to its role in depleting the ozone layer via the United Nations Montreal Protocol (Gareau 2013).

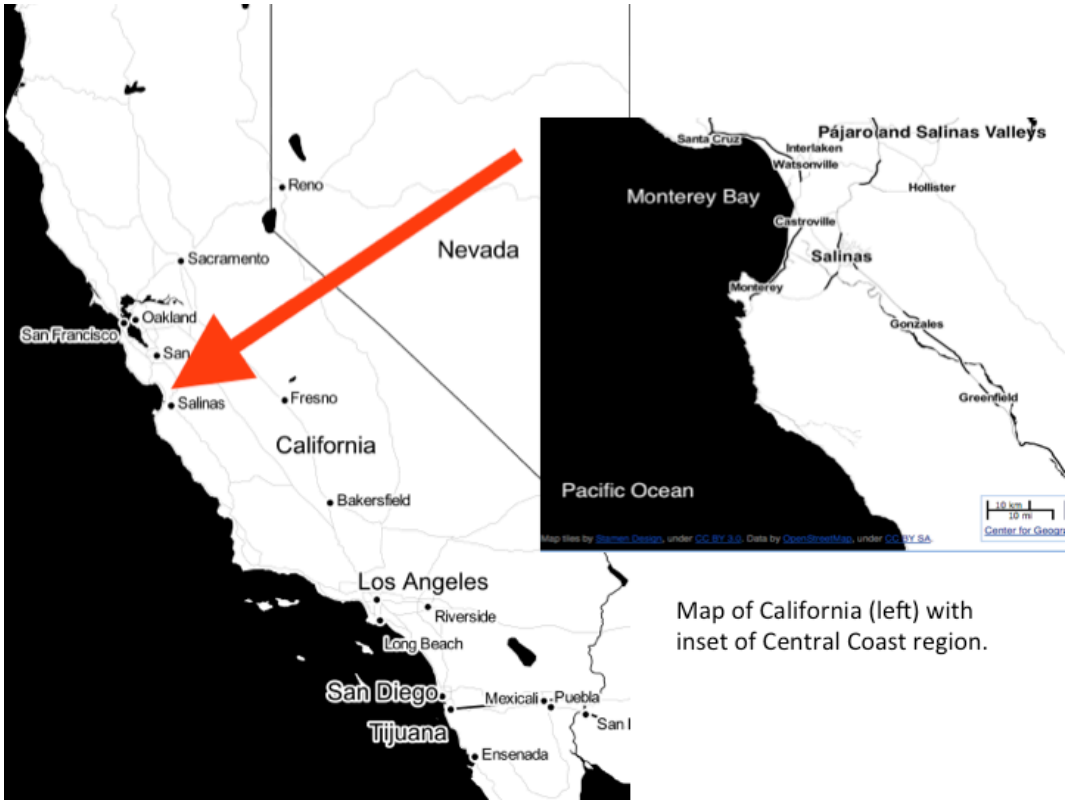

Figure 1: Pájaro and Salinas Valleys, located on California's North Central Coast. Source: Saxton 2015, made with Open Source software provided by Harvard University's World Map.

The Pájaro Valley and Salinas Valleys are unquestionably productive, amounting to nearly fifty percent of California's entire strawberry acreage (California Strawberry Commission 2014). Overall, California produces at least 92 percent of the strawberries grown nationally and consumed in elite markets globally (Wu *et al.* 2012: 6). Yet, the heavy use of toxic pesticides and other agricultural inputs and their effects on the health of farmworkers, children, and other rural residents is of grave concern. The harms caused by pesticides are also routinely contested by agribusinesses and state regulatory agencies charged with the sometimes conflicting roles of evaluating the safety of toxic chemicals and protecting public and environmental health (Harrison 2011; Saxton 2013, 2015).

In this article, I continue processing what roles anthropology can play in addressing the serious problems traditionally encountered, documented, analyzed, and theorized—but not always acted upon—during ethnographic research. I describe how, in my experience, the methods of anthropology and activism

were cross-fertile grounds because I synthesized the work the EJ movement needed with the work I had set out to do as an anthropologist. Research, community service, and organizing agendas intersected and reinforced one another during my participation in the environmental justice movement against methyl iodide, produced rich and useful ethnographic data, and contributed positively to efforts aimed at protecting community environmental health.

While some anthropologists warn of the challenges that activist research entails, such as the emotional tolls or barriers to accessing participants in positions of power (Checker 2005; Hale 2006; Nader 1972; Scheper-Hughes 1995), I found that my linked roles as a researcher-activist created unique opportunities for engagement and analysis. This occurred up and down the agricultural hierarchy; with farmworkers, students, teachers, health care providers, and rural residents as well as agricultural extension agents, pesticide lobbyists, advocates, growers, and pesticide applicators, who I interviewed formally and semi-formally and observed and interacted with throughout the course of my fieldwork. To conclude, I propose a framing of 'ethnographic movement methods' that explicitly and intentionally observe and respond to communities' social and ecological needs in more mutual, cooperative, and intersectional ways. As we enter an era of multilayered and overwhelming environmental hazards and devastation, and as corporations gain rights and privileges that exceed or annul those of people we work alongside, anthropology can no longer simply acknowledge the role of history in shaping inequalities and social movements. As Johnston observes, "Human adaptation to changing environmental circumstances requires time, space, and the means to implement change. Yet time is an increasingly scarce commodity, especially given the rapid pace of degenerative change" (2010: 11). Our ethnographic tool kits must be put to use to *make history* alongside research and movement participants working towards the creation of alternative socially and environmentally just futures.

2. Anthropologists as activists

There is a rich historical tradition of grounded "people centered" research and action that is not only inspired by, but developed and directed by communities (Nabudere 2008). The debate over objective and subjective research is well worn in anthropology (Foley 1999) but not necessarily in ways that are fruitful or useful to the communities we work with (Speed 2008). As many (Checker 2005; Scheper-Hughes 1990, 1995; Singer 2000) have observed, anthropology, even of the oft-celebrated public or applied varieties, may be of little utility to people we work with. In some cases, applied anthropology causes harm, even if this was not the intended outcome of the anthropologist (Huizer 1979; Hymes 1969; Wolf and Jorgenson 1970).

Even those with a critical lens get caught up in tides and currents of theorization, analysis, and application that neglect the lived experiences and urgent needs of human beings (Butt 2002; Scheper-Hughes 1990; Smith 1999; Speed 2008). Communities may also experience the well-intentioned efforts of academics and intellectuals as patronizing, unsustainable, or insincere, as individuals and institutions impose their own theories and methods upon "the other" (Nabudere 2008; Speed 2008) and sometimes seek affiliations with suffering communities to advance their own careers and agendas. Anthropology, with its fraught ties to colonialism and imperialism "was [and continues to be] challenged to decolonize" (Speed 2008: 213). Thus, the intentions of applied and activist work are as important as the outcomes (Indigenous Action 2014, Veteto and Lockyer 2015).

Anthropologists have pondered, how do we diagnose social problems and structures (Cartwright and Manderson 2011; Foley 1999; Kleinman and Benson 2006; Quesada, Hart, and Bourgouis 2011)? Should we wait for history to be made to right contemporary wrongs (Scheper-Hughes 1990)? How can we be involved more directly, for instance, as mediators or brokers, in clinical and advocacy contexts (Kline 2010; Scheper-Hughes 1990)? How can we make reflexivity and engagement less self-centered, and less apolitical (Boyer 2015)? How else can we use ethnographic methods and relationships to imagine and create (Burke and Shear 2014) an anthropology that is "politically committed and morally engaged" (Scheper-Hughes 1995: 410)?

There are no easy paths to take when asking these questions about the uses of our work, considering how it can be (under)/(de)valued by professional peers, who are not always sympathetic towards activist scholarship (Greenwood 2008: 219; 2008: 91-92). Agencies, funders, and employers often misunderstand activist scholarship and consciously and unconsciously undermine it by mandating how and in what proportions our time and energies should be spent. Activists know that discomfort, disturbance, and

destabilization are critical parts of effective organizing for social and ecological change. They may ask academics to share their privileges, resources, and institutional affiliations as a means of contributing to activist causes (Shayne 2015; Walsh 2014) or use teaching and public scholarship to foster empathy and organized alliances between groups separated by geographic, cultural, or language barriers (Pine 2013: 150). Feminist activist researchers (Shayne 2015) juxtapose the sharing of researchers' cultural capital as an alternative to experiencing ethnographic interchanges solely through guilt which may evoke sympathies (Gable 2014:239), but can also work counterproductively with social movements if it fosters "apathy and inaction" (Shayne 2015). Given what is at stake in the world, we need to take those requests more seriously and strategize how our methods can become integral parts of movements.

For Hale (2006: 97-98), activist anthropology is "*a method*" (emphasis added). He reflects:

> To align oneself with a political struggle while carrying out research on issues related to that struggle is to occupy a space of profoundly generative scholarly understanding. Yet when we position ourselves in such spaces, we are also inevitably drawn into compromised conditions of the political process. The resulting contradictions make the research more difficult to carry out, but they also generate insight that otherwise would be impossible to achieve.

Over the span of two years, my version of multi-sited fieldwork included a number of social and physical positions. I could be found sprawled on the floor of the teachers' union office making information packets on methyl iodide for city councilors and county supervisors. I conducted interviews in farmworker households, attended agricultural occupational health and safety meetings and pesticide development conferences, and spent hours with high school students on farmworker environmental health science research translation and outreach efforts. I also accompanied a teachers' union organizer and former public school student and son of farmworkers to the glass-walled high-rise lobbying office of a Sacramento lawyer whose job it was to protect agribusiness interests, including the right to use methyl iodide in California. Each of these field sites helped me learn about the complexities of the political ecology of pesticides and farm work in the Pájaro Valley. I also shared my field notes and analyses with anti-pesticide activists, contributing methodological labors directly to the movement in real time.

3. Political ecology: farmworkers and soil fumigant pesticides

Soil fumigant pesticides are one of many invisible layers of environmental suffering endured by farmworkers and their families. Elsewhere (Saxton 2013, 2015) I have described the syndemics (Mendenhall 2013; Singer and Clare 2003) and chronicities (Manderson and Smith-Morris 2010) of farmworker health: the accumulation of illnesses and diseases in individual or community bodies that layer and exacerbate one another over time, and are further intensified by social, economic, political, and environmental disparities and inequalities. Farmworker health and illness narratives are akin to layers of the soil, wherein each layer of sediment represents a life phase. Since soil fumigant pesticides are used to sterilize the soil of all life forms, my metaphor compares layers of soil, which when not treated with soil fumigants are alive and supporting millions of other organisms, to the phases and layers of farmworkers bodies and lives, which are riddled with inequalities, including: health disparities, toxic exposures, abuse by workplace supervisors, police, and border patrol agents, among others (Figure 2). Soil fumigant pesticides are literally invisible: as highly volatile and odorless gasses, as substances with health effects that may take many years, generations even, to manifest, and that largely affect farmworker communities, which are also rendered invisible by their marginalized social status. Pesticides are also figuratively invisible, as few who eat fruits and vegetables are aware of their pervasive use and devastating health and environmental consequences. Even people who live on California's Central Coast but who are not directly involved in agricultural production expressed shock when presented with information about how soil fumigants are used throughout the strawberry production cycle, from the cultivation of nursery transplants to the post-harvest practice of gassing berries with fumigants to prevent the import or export of hitchhiker pests (Saxton 2015). Area residents are very nostalgic and attached to strawberries, taking pride in a locally produced commodity that connects the region to the rest of the world and celebrating the fruit annually at the Watsonville Strawberry Festival. Tourists, residents, and passersby consume strawberries in an array of prepared dishes and delicacies but learn little about the lives of the

farmworkers who make the six-month season possible each year. Popular associations of strawberries with sweetness, innocence, and nostalgia need to be juxtaposed with the environmental suffering farmworkers and rural residents endure as a consequence of the political ecology of pesticide intensive farming.

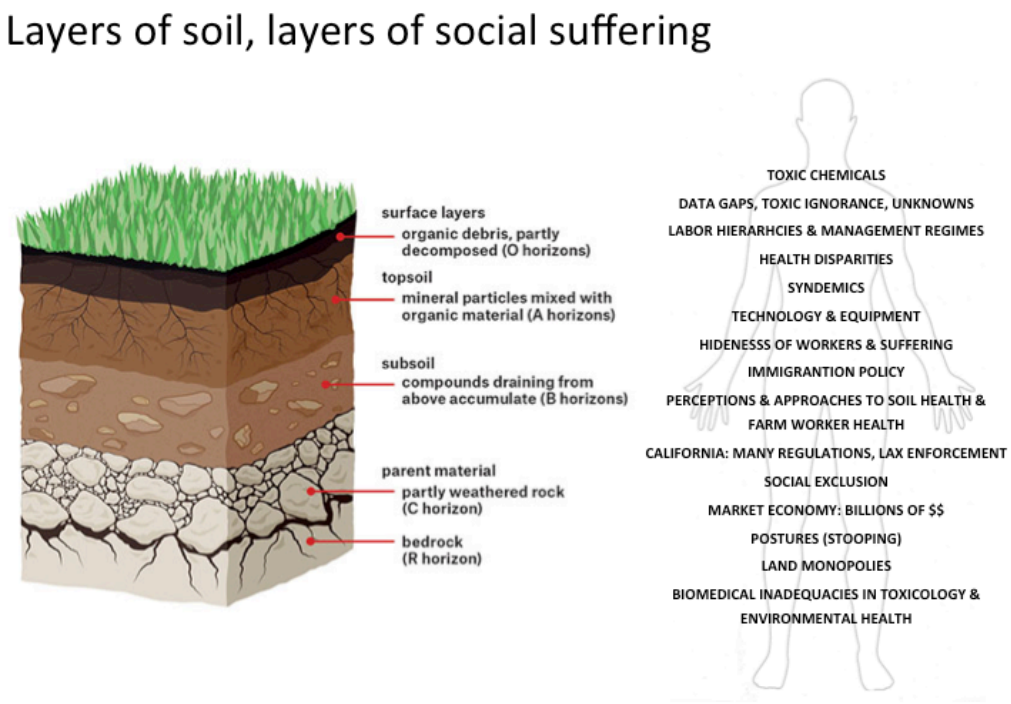

Figure 2: Layers of soil and social and environmental suffering for farmworker families. Source: Image compiled by Saxton 2015, with soil image by Kate Francis (Accessed October 25, 2015 http://www.timberpress.com/blog/2015/07/how-soils-form-and-age/) and body silhouette (Accessed October 25, 2015 at http://diagrampic.com/printable-human-body-outline/).

Arysta LifeScience, the Tokyo-based manufacturer and patent holder of methyl iodide, had been working for years to produce and market what they touted as a drop-in replacement for methyl bromide—another toxic soil fumigant. Since 1989, methyl bromide has been in the process of being gradually phased out under the United Nations Montreal Protocol, which regulates ozone-depleting substances.[2,3] Arysta set out to ensure methyl iodide's approval in California, a critical market for soil fumigants that would set a precedent for sales throughout the rest of the U.S.

Under the Bush Presidential administration in 2008, the U.S. EPA (Environmental Protection Agency) approved methyl iodide for agricultural use. In 2009, Arysta received the EPA's 'Ozone Layer Protection Award' for their development of methyl iodide which, unlike methyl bromide, is not ozone depleting (EPA 2011). Ironically, its other properties are cause for grave concern over environmental health. In California, all

[2] While the overall use of methyl bromide has decreased dramatically over the past ten years, the decline is not as dramatic in California's strawberry industry, and use has increased in the nurseries that produce strawberry seedlings (Bale 2014; Nguyen 2011; UNEP n.d.).

[3] This should have been completed by 2005, but as of this writing the process has extended into 2016, as the US EPA continued to issue a gradually decreasing and limited number of Critical Use Exemption Permits (CUEs), which are for growers that argue they would face undue economic hardship without being able to use methyl bromide. At the time of this writing, CUEs were only available to producers of ham (which is fumigated to kill mites during the curing process) and strawberries (EPA 2014).

pesticides undergo additional public and environmental health and safety evaluations by the California Department of Pesticide Regulation (CA DPR). This includes outside evaluation by a committee of experts known as the Scientific Review Committee (SRC). Arysta provided some health and safety data from their in-house studies (as per the law's requirements), but as Froines *et al.* (2013) observed in reflection of their roles on methyl iodide's SRC, the health data were incomplete and at times inaccurate.

The strawberry industry in California and elsewhere is very dependent on soil fumigants. What growers describe as "clean" soil—code for chemically fumigated soil—helps insure higher and more reliable yields, in theory. Every August through October, farm fields are covered with plastic sheeting following the injection of soil fumigants into the ground by way of a tractor affixed with a shank attachment. A few days to several weeks later, depending on the fumigant used, the tarps are removed and the fields can be prepared for transplanting new crops. Drift, or the movement of volatilized liquids or gases from the site of application to another non-target site, is not an uncommon occurrence (Harrison 2011; Saxton 2013, 2015). The plastic sheeting, or tarps, too, may rip, tear, or come undone, allowing gasses and vapors to leak out and exposing rural residents, workers, or passersby to toxic substances.

Even when scientific studies are released that support negative experiences with and perceptions of pesticides (Gemmill *et al*. 2013), grower-shipper companies commission other researchers and work fervently to produce studies that aim to delegitimize, downplay, or discount the evidence (e.g. Alexander 2013). Their findings support claims that pesticides, especially soil fumigants, can be used safely when applied in compliance with the product label. Pesticide companies, and other industries that produce toxic substances that harm human and environmental health, have long been in the business of producing and circulating evidence that negates the safety claims against said substances or practices (Conway and Oreskes 2010). Elsewhere (Saxton 2015), I have described how standardized models of risk assessment neglect other variables when it comes to pesticide exposure, such as the possibility for some endocrine disrupting pesticides to be toxic at lower doses (Vandenberg *et al*. 2012), or the assumption that all possible outcomes are predictable (see also Harrison 2011, and Olson 2010).

Harrison (2014) explains how notions of what constitutes justice (individual vs. community-level) also shape how rules and regulations are developed and enforced, and that the ways in which regulatory agencies define scale and severity of accidents or exposures has also worked to effectively dismiss or minimize community claims and concerns about pesticides (2006). She further asserts that "a mosaic of factors…have worked together to produce a regulatory structure that has always been better at registering pesticides than at reducing pollution" and routinely downplay the harm caused by pesticide drift incidents and deny the chronic toxicity of pesticides (Harrison 2008: 119; 2006). Furthermore, grower-shipper firms often mobilize moral claims about the importance of pesticides in protecting agricultural jobs and generating regional economic growth in an area that is struggling with unemployment, homelessness, and food insecurity (Saxton 2015).

Farmworker experiences and perceptions regarding pesticides are variable. Some may express deep concern about the potential health effects of pesticides. They may also feel powerless to do anything about it since they do not control working conditions (Arcury *et al.* 2002). Others may discount the dangers, internalizing racialized logics of the extreme resilience and male strength of Mexicans (Holmes 2013; Quandt *et al.* 2000) or are only conscientious of acute rather than chronic effects of long-term exposure (Quandt *et al.* 2000). Others possess a wealth of lay knowledge developed from years of experience working in the fields, but have limited access to technical or legal knowledge about pesticides (Flocks *et al.* 2007). In Mexico and elsewhere, pesticide use among *campesinos* (peasants) is encouraged as it is touted as a sign of agricultural modernization and social progress (López 2008). Elsewhere in the Americas, farmworkers feel that organic practices, while ideal, cannot meet their immediate and urgent economic needs as small farm families sacrifice labor and limited resources to produce fresh produce that is of an acceptable quality for transnational grower-shipper companies, and many times, their products are rejected and must be sold locally for lower prices (Dowdall and Klotz 2014). Globally, farmers and farmworkers struggle with the perceived necessity of pesticides for economic survival and the embodied health consequences (Widger 2014). For some farmworkers in the Pájaro Valley, who are paid piece rates, the lower yields of organic berry farms encourage and incentivize the acceptance of pesticide-intensive production (Saxton 2013, 2015).

What follows are two different examples of ethnographic movement methods in farmworker communities at two different ends of the generational spectrum (youth and farmworker parents) and two

different ends of the agricultural hierarchy (a farmworker household and rural high school, and a Sacramento agribusiness lobbyist's office). They exemplify what I call ethnographic movement methods, wherein the goals and activities of anthropological research and political ecology are synced with the goals and activities of social and environmental justice movements.

4. Activism as research: pesticides, *paisanos,* pancreatic cancer and Parkinson's disease

In 2012, from the (dis)comfort of my desk, I shifted from researcher-activist to full time dissertation writing. I grappled with the pull from the community to keep contributing to various EJ campaigns and the need to step back, articulate my experiences on the pages, and finish my PhD. It proved to be a very emotional transition. I was not always successful in my efforts to focus on writing until I moved into an Airstream trailer outside of town, took a teaching job at a local state university, and turned off my phone for hours at a time.

In fall 2012, while my phone was still on, I received a text message from Lucero, a former strawberry farmworker who had migrated with his brother Gerardo from the Mexican state of Jalisco in the 1970s following their father's death. They wanted to know more about pesticides used in the strawberry fields in the 1980s. Gerardo had recently been diagnosed with Parkinson's disease. I made time to visit, and accompanied Lucero, as we walked up a home-crafted wooden ramp into the small one-story home where Gerardo, his wife Claudia, and twelve year-old granddaughter Mariana lived.

Both brothers wanted to know if there were any relationships between Gerardo's pesticide exposure, Parkinson's disease, and the pancreatic cancer that claimed the lives of six of their coworkers, Among the co-workers afflicted with pancreatic cancer were Gerardo's former employer, José Hidalgo—a *bracero* (a now defunct guestworker program that recruited farmworkers from Mexico to work on U.S. farms from 1942-1964), turned sharecropper, turned farm owner-manager. Hidalgo Farms continues to operate today under the management of José's two sons, and some of Gerardo's original coworkers are still employed there. The family patriarch died in the mid-1990s and is buried in the public cemetery.

Back in the 1980s, Gerardo worked for Hidalgo, picking berries and applying pesticides with a crew of about ten other men, all from the same small *rancho* (village). They pulled hoses, a method of pesticide application in which one worker would drive the tractor carrying the tank of chemicals (usually mixed manually by another worker) while others would follow heaving a long spray hose from row to row. This awkward, strenuous, and sweaty work required a lot of jumping over strawberry rows up to eighteen inches tall.

The brothers asked me to use my research skills and networks to see if I could find out what, exactly, Gerardo had been exposed to and if the scientific literature linked those substances to Parkinson's. The only clues I garnered from our discussion were the name of the farm, Gerardo's memory of signing a form acknowledging the rules governing time-use restrictions on some pesticides, and his recalling of the Mediterranean fruit fly crisis, which required extra agrochemical interventions. He also remembers being routinely gassed in the face when ripping up tarps following soil fumigations. When describing this, his face contorted and his pitch rose as he reenacted the burning sensation in his nose and eyes.

I wrote an email to an agricultural extension agent who explained to me that Gerardo was likely exposed to organophosphates. Organophosphate pesticides work by disrupting the critical electrical messages between the brain and the body, which are carried by the nerves, causing paralysis, nerve damage, enzyme imbalances, and/or death. While pesticides are usually aimed at killing insects, rodents, weeds, fungi, or microscopic bacteria and nematodes, other organisms, including humans, are susceptible. Other pesticides widely used in the conventional strawberry industry in California may cause the pancreatic cancer that killed at least three of Gerardo's workmates and his boss (Bassil *et al.* 2007; Ji *et al.* 2001; Moses 1999). Several of the most common soil fumigants used in California—methyl bromide, chloropicrin, metam sodium, and Telone—are known carcinogens, neurotoxins, and hormone (endocrine) disruptors (PANNA 2012).

Gerardo remembered waking up on a Sunday unable to move after six days and sixty full hours of spraying pesticides with the hose. His condition gradually worsened, but he continued to work until 2011 at the age of 63, when his tremors became too uncontrollable. That year, a neurologist diagnosed him with Parkinson's and sent him to a specialty care center affiliated with a university hospital where Gerardo

participated in a clinical trial that has greatly improved his quality of life. Still, Lucero observed that his brother's condition continues to deteriorate. Gerardo's migrant cohort and coworkers keep tabs on one another through phone calls, random encounters in town, or through gossip and word of mouth. This is how he heard about the deaths of other *compañeros* (friends, coworkers) who pulled hoses with him long ago, due to pancreatic cancer. Many others moved back to Mexico after retiring from farm work. It is possible that they are sick, dying, or dead, too.

I used my university library access to look up scientific journal articles about pesticides, Parkinson's, and pancreatic cancer, and was able to use my research skills and bilingual language abilities to help Lucero and Gerardo address their questions that emerged during the course of the methyl iodide conflict thirty years following Gerardo's exposure. Their goal was not to sue their former employer or to make any sort of public outcry. Instead, it was about trusting their instincts even as Gerardo's doctors, when asked about links between pesticides and Parkinson's, insisted that his illness would only be exacerbated by anxiety and anger, and that he should try not to think about things that give him distress.[4] It was about trying to validate their ideas and suspicious that had developed quietly over the course of thirty years.

This quietude, or silence, is conditioned and reinforced by different layers of social norms and inequalities (Farmer 2004). There are the paternalistic sentiments that govern *paisanos'* (people from the same village or region) relationships with one another, and their employer, who is generally remembered as a generous person who helped many people cross the border and find work. There is the feeling of intellectual inferiority, bolstered by the fact that many farmworkers have completed an average of six years of school in Mexico (López 2008), that I heard time and time again expressed in phrases such as "*Pues, no se*" (well, I don't know), or "¿*Quién sabe*?" (who knows?). There are also institutional silences, such as when CA DPR or the EPA issues calls for more research before making regulatory decisions on chemicals with potentially life altering or threatening properties. And people (be they scientists, school teachers, health care providers, farmworkers, rural residents, or activists) who have also experienced pesticide exposure and related negative health effects, are also silenced by agribusinesses and regulatory agencies that quickly and often condescendingly assure the public that these substances are safe when used according to product label guidelines. They also silence people by delegitimizing their concerns as irrational, overly emotional, or psychosomatic.

Listening and following up not only on the questions I had for Lucero and Gerardo but for the questions they asked of me, could be considered a form of pragmatic solidarity: practical ways of supporting the people that we work with while at the same time using our work to push for larger structural-level changes (Farmer 2004; Holmes 2013). It made anthropology a more mutual act, parallel to the Brown Beret's requests for me to assist them with their anti-soil fumigant activism. As Holmes (2013) observes, there is a "…need for solidary to move beyond only the pragmatic, the practical, or programmatic" (191). How can we push the limits of pragmatic solidarity to apply anthropology in ways that are not necessarily practical or convenient, but that are urgent? The stories of public school teachers and students that follow demonstrate such possibilities.

5. Students and teachers: activism as pedagogy

The children and grandchildren of farmworkers find themselves caught between two worlds. They see how they are the direct beneficiaries of their parents' labors in the fields, however precarious their positions are, and even though farm work wages are quite meager, they are much more than one could earn farming or working in rural West-Central Mexico. Some farmworkers, especially men, are also coerced by hopes that they may someday ascend the agricultural labor hierarchy and become foremen, supervisors, tractor or truck drivers. Farmworkers' children, too, surrounded by agribusinesses, sometimes attend university to study plant science or agricultural business so that they can have year-round stable incomes with health care coverage and other benefits not normally afforded to those who work in the fields. Many families hope that their children

[4] This is similar to observations by Scheper-Hughes (1992) when doctors in Brazil medicalized the social suffering and emotional distress expressed by parents of starving children in shantytowns, offering pills instead of plans to improve area food security.

will earn enough money to buy a family house, in the U.S. and/or Mexico, enabling parents, whose bodies and souls are worn from decades of farm work, to retire and live comfortably while their kids and grandkids support them.

The dominance of agribusiness over the socioeconomic and physical landscapes that shape lives in the Pájaro Valley, did not, however, foreclose critiques by farmworkers and their children of the current political ecology of agriculture and farm labor. Children's health proved to be a critical source of inspiration for sustained action around soil fumigant pesticides (Figure 3). Youths' experiences with asthma, learning disabilities, and teen pregnancy, along with witnessing their parents' daily struggles made them think critically about the roles of agricultural pesticides in sustaining their local economy and livelihoods. Public school teachers, too, linked recent soil fumigant applications in fields adjacent to school buildings to disturbing symptoms: headaches, chronic nosebleeds and projectile vomiting (Saxton under review). Many also suspected that pesticides contributed in part to the high rates of learning and developmental disabilities their students struggled with.[5]

Figure 3: Students and teachers marching up the parking lot ramp at Watsonville City Hall. Source: Saxton 2010.

What follows are some brief examples of how my explorations of the contested ideas and experiences with soil fumigants and other pesticides merged ethnographic and movement methods in order to contribute understanding and concrete and critical responses to the issue at hand (Singer 1995:98).

[5] More and more evidence has come out supporting these teachers' theories regarding the relationship between chemical exposure, either in utero or in the first five years of life, and learning and developmental disabilities that may affect children (and their parents) for the rest of their lives (Eskenazi *et al.* 2010; Gemmill *et al.* 2013; Heindel 2000; Huen *et al.* 2009; Marks *et al.* 2010; Schettler 2001; Schettler *et al*. 2000). Anthropologist Elizabeth Guillette and colleagues (1998) compared and contrasted the neurobehavioral development of two different groups of Yaqui children in Sonora, Mexico: one living in an agro-industrial valley, where pesticide use is routine, and one in mountains where communities practice traditional pesticide-free agriculture. The results indicated significant developmental delays among children in the valley, especially with respect to hand-eye coordination, fine motor skills, and short-term memory.

Seventeen-year-old high school student Gloria sat with her peers and their teacher Diana in an after-school anti-pesticide community service group. The hours they spent on this project counted towards the forty hours of community service required for students to graduate high school in the Pájaro Valley Unified School District, but that certainly was not their only motivation for participating. As the eldest daughter of migrant strawberry pickers, Gloria expressed concern for her family's health. Her friend, 16-year-old Ofelia, six-months pregnant at the time, joined the afterschool working group. For weeks, they worked together with Diana and I to design bilingual informational materials for farmworker relatives about the potential dangers of methyl iodide (or *yoduro de metilo*). They developed a presentation of their findings and concerns for the school board and other city and county-level leaders, agencies, and organizations. At the school board meeting in late November 2010, teachers, students from the migrant program, Brown Beret members, as well as some parents, showed up holding signs with expressions such as "protect students' health", "we are not lab rats", "do not experiment on us", "we don't want cancer in Watsonville", "moms don't want to worry about children dying", "methyl iodide is bad for us!" and "we want clean air." All of these poster slogans expressed a very sophisticated understanding of the political ecology of pesticides, their suspected effects on the body, and the pesticide evaluation and approval processes currently used by the U.S. EPA and the CA DPR (Figure 4).

Figure 4: High School students at Pájaro Valley Unified School District school board meeting. Source: Jenn Laskin 2010.

Ofelia took to the microphone, a hand rubbing her round belly affixed with a "no methyl iodide" sticker featuring a strawberry shaped like a skull and cross bones designed by Pesticide Action Network, one of the larger NGOs that supported local campaign efforts in the Pájaro Valley. She expressed concerns about her child's future, having learned about the potential for birth defects and developmental problems that could

result from exposure to methyl iodide *in utero*, worries echoed by the CA DPR's Scientific Review Committee (Froines *et al.* 2013). More recently, the California Department of Public Health (CDPH) has also expressed concerns about the proximity of schools in certain agricultural counties that have very high use of some of the most toxic soil fumigants and pesticides (CDPH 2014).

Gloria's mother, Rufina, shared these sentiments, while I visited their house on the outskirts of town (surrounded on all sides by strawberry fields). Rufina, in particular, mentioned her concern for pregnant farmworker mothers. Every year, an official notice is posted in English on their front door indicating a pending soil fumigation or other pesticide application; however, the family did not have anywhere else to go. Rufina said they just kept the windows closed and waited to do laundry, which they hung on a line outside to dry, until the weeklong reentry period had passed.[6] She depended on Gloria to translate the notice. At the clinic where Rufina received prenatal care during her most recent pregnancy, she learned that exposure to pesticides can cause harm to unborn babies (*las crias*): miscarriages, stillbirths, birth defects and developmental disabilities.[7]

Gloria's father Uriel, on the other hand, had worked on both conventional (pesticide-intensive) and organic berry farms and felt that he made less money when harvesting organic due to lower yields.[8] While he expressed concern about the health effects his daughter had shared with the family, he also worried that without soil fumigants to keep the soil "clean" and free of pests that harmed the berry plants, he would make significantly less money. Worse still, banning or restricting soil fumigants could put him out of a job. With a family of four kids to support, this thought in particular scared Uriel and made him defensive of and loyal towards his employers and their production practices. While Gloria's parents expressed pride in their daughter's accomplishments during her final year of high school, the immediate needs of feeding and sheltering their family came first.

After a while, Gloria and her classmates lost a lot of enthusiasm for this work. They felt that too many of their farmworker family members and acquaintances were apathetic or indifferent towards pesticides. What difference could they possibly make in this struggle without the enthusiastic support, participation, and interest of their community? This dramatic decrease in involvement peaked following a very exciting and successful presentation to the Watsonville City Council. An independent consultant hired by Arysta LifeScience, was also present at this meeting, with the sole purpose of reminding local policy makers that they had no authority to regulate pesticides and to discourage them from using their political positions to make a statement about the pending approval of methyl iodide. Unmoved by Arysta's spokesperson, touched by the students' efforts to engage politically, and reminded of their own families' experiences in agriculture, the Watsonville City Council voted unanimously to support the students and passed a resolution urging more caution before shifting to methyl iodide.

The next day, on December 1, 2010, Governor Schwarzenegger approved the CA DPR's recommendation to register methyl iodide for agricultural use, against the advice of the Scientific Review Committee. The students' spirits had been effectively dampened and their enthusiasm rapidly diminished, but college students and the Brown Berets continued to work on the issue. They tabled at farmers' markets and coordinated a direct action on a street corner in Salinas, CA next to the hotel where representatives from Arysta LifeScience had been scheduled to meet with area growers to convince them to adopt methyl iodide. Upon getting word of the protest, Arysta cancelled the meeting. The state teachers' union sustained

[6] Re-entry intervals (REIs) are set by the CA DPR and are intended prevent workers and passersby from entering a field where pesticides or soil fumigants have recently been applied. However, farmworkers I interviewed indicated that REIs were not always enforced, and the policies did little to protect rural residents, students, teachers, or school staff or lived or worked adjacent to farm fields.

[7] Not all doctors' offices provide such comprehensive health care with respect to patient education on pesticide exposure risks. Planned Parenthood, Physicians for Social Responsibility, the American College of Obstetricians and Gynecologists, and unionized nurses, were among the few health-based organizations and health care providers to join the students and others in the struggle against methyl iodide. Local non-profit clinics and some private practices specializing in occupational medicine, often financed by grants and donations from or patronized by agribusinesses, remained overwhelmingly silent on the issue.

[8] Yield differences between organic and conventional production in strawberries and other crops is debated and conflicted in the literature and varies by region, growing conditions, and farming techniques (Seufert *et al.* 2012).

momentum by connecting prominent journalists to the story (Bacon 2012; Saxton under review; Spinks 2011). We also collaborated on opinion editorials (Saxton 2011, 2012).

Teachers' union representatives also organized a successful divestment campaign after learning that educators' pensions were tied to Permira, the private investment firm that had purchased Arysta LifeScience in 2007 (CFT 2011; Saxton 2013, under review). I supported teachers and students in their efforts, mobilizing my research, writing, and framing skills to craft several successful resolutions, and by accompanying them to a meeting with grower-shipper and pesticide lobbyists in Sacramento. In a glass-windowed fishbowl conference room, teacher Diana, her former student Pepe, two leaders from the California Federation of Teachers, and I met with three growers and four representatives from various grower-shipper lobby organizations. Over catered cookies, soda, and bottled water, the growers shared their positive experiences with methyl iodide during research trials and attempted (unsuccessfully) to discourage the teachers' union from taking further action. "What do we need to do to get you to stop?" remarked the prominent agribusiness lawyer towards the end of the meeting. Teacher Diana, while sympathetic to the stories of the growers, indicated that she and fellow activists would not stop organizing until they could be assured of student and farmworker safety and wellbeing.

6. Discussion

A number of factors led up to Arysta's eventual voluntary retraction of methyl iodide from the U.S. market (Guthman and Brown 2015), but the efforts of regional activists solidified popular consciousness and commitment to address soil fumigants and other environmental health disparities in the Pájaro Valley (Saxton under review). What follows is a discussion of how anthropologists might use their participation in EJ movements to solidify the relationships between movement and research methods, or what I refer to as "ethnographic movement methods." Anthropology, as a holistic human science, can do more to break down pragmatist arguments that the only research and interventions that should be undertaken are those that are "doable." We can use new approaches and applications of research methods to push back against the politics of the possible (Sangari 2002). Lipsitz echoes the potentials of scholars and activists: "The outcomes of their activities influence what reporters report, what teachers teach, what writers write, and what decision makers decide. When scholars and activists work together, they gain access to a broader array of analyses, practices, and tools than they would have otherwise" (2008: 92-93). In these ways, there are opportunities for anthropologists to mobilize their many individual and institutional privileges—including research methods, problem solving skills, multi-vocal writing strategies, research and language translation—to contribute to and advance the goals of EJ groups and movements.

The moment when the Watsonville Brown Berets flipped my request for research assistance back on to me created a space where anthropology could become a more mutual act (Scheper-Hughes 1995:410). While I initially felt what seemed like an inevitable disjuncture between my research goals and activist proclivities, the Berets helped me realize alternative possibilities. They, and others I met during my fieldwork, taught me that the ways in which farmworkers and anti-pesticide community organizers put me to work on the anti-methyl iodide campaign were inherently ethnographic and ethical in ways that transcended the scripts of my IRB application and original proposals. They saw how it might be useful to them even as I initially felt uncertain about how our goals could coalesce.

Far too often, researchers had come and gone to the Pájaro Valley, taking data or film footage, publishing or producing it, and never sharing let alone applying it in ways that benefited farmworkers. Linda Tuhiwai Smith, an Indigenous scholar, reminds us how the uses of research are often be experienced as useless by those being researched:

> Taking apart the story, revealing underlying texts, and giving voice to things that are often known intuitively does not help people to improve their current conditions […] it does not prevent someone from dying…Research is not an innocent or distant academic exercise but an activity that has something at stake and that occurs in a set of political and social conditions (Smith 1999: 3,5).

The communities we work *with* cannot afford to partake in apolitical projects; their lives are at stake, as Gerardo, Gloria, Ofelia, and their teachers, family, and peers, and the Watsonville Brown Berets have shown. There are also ways of knowing that one cannot qualify or quantify through standard research methods or regulatory probabilistic risk models. It has become more difficult for me to fragment the different and complementary roles that service and solidarity with farmworkers, students, teachers, and anti-pesticide activists entail. While certain genres of community-based participatory research and participatory action research attempt to codify certain kinds of people (communities), relationships, and processes; the daily realities and uncertainties faced by EJ communities may require more spontaneity and flexibility. [9] Furthermore, if these kinds of research practice are to indeed be participatory, action-based, and community-centered, they need to entail more than a check-list of dos-and don'ts, or a roll call of key stakeholders. Just as in Kleinman and Benson's (2006) critique of clinical approaches to cultural competency as a universal approach, nor should "community" be treated as a "check list" of stakeholders and milestones. Applied or activist research is not a linear series of steps that can be followed in a neat and logical sequence—and this parallels the cycles and circuits that shape Indigenous worldviews and ways of being.

Such critique can extend to our written work, inviting us to be inclusive of things that communities are demanding. For example, Chicana feminist and author Cherie Moraga transcribed her experiences working with farmworker communities confronting pesticides into a theatrical play entitled *Heroes and Saints* (1992). Anthropologists can hone their broad skill sets to engage with new approaches not only with research methods, but also with research dissemination and application beyond what is required of us by our institutions of affiliation and funding. I often urged anti-pesticide NGOs to ditch their text-heavy brochures and reports, which were photocopied copiously and handed out while tabling and collecting signatures. While they contained important information, they were of little use to farmworkers, who had varying levels of literacy. A re-adaptation and filming of Moraga's play would likely have been more effective and engaging for many of the audiences that anti-pesticide NGOs want to reach. While I do not necessarily see writing this article in an academic journal (albeit, an open source one) as a form of the "participatory (re)action," I am calling for, it is my hope that at a minimum, continuing to do and write about ways in which anthropology can and does serve social, health, and environmental justice movements will destabilize norms about what counts as scholarship and research, and inspire newer generations of scholars to align themselves and their methods with such movements earlier on in their careers. In other words, I want this piece and my mobilization of methods in and for the movement to serve as a model for how we can push the politics of what is possible, permissible, and passable in our own discipline, other disciplines, and in the non-academic world as well.

That being said, in writing this piece, I am being held to scholarly standards. I am also beholden to the expectations and anticipations of the communities that instigated and inspired my work. The Berets held me accountable to the community but also to a vision of how anthropology could work in the public interest. Anthropological methods, the theories of political ecology, and the strategies of activists became synthesized and inseparable in my work. My dual roles as an anthropological researcher and community organizer in the movement challenging toxic soil fumigants and other forms of farmworker abuse required a lot of ethical reflection. They also enabled me to mobilize critical qualitative research findings into practice in real time. These experiences included:

> 1) Making environmental and health science tangible to numerous multilingual audiences through the production of oral and written educational materials and presentations, while also translating farmworker experiences to allied activists and representatives from anti-pesticide NGOs;
>
> 2) helping community members craft bilingual resolutions, petitions, presentations, and outreach materials;
>
> 3) studying up by attending grower lobbying meetings and agricultural occupational and pesticide safety trainings;

[9] Ingold (2014: 384) notes this with respect to the appropriation of ethnography more broadly—as a catch phrase dropped into regimented proposals and protocols, instead of a process of long-term engagement.

4) working as a team with teachers, scientists, labor unions, students and youth, rural residents, farmworkers, journalists, politicians, non-profits, health care workers, and others (Figure 5);

5) speaking to policy makers and observing their reactions and responses; and

6) using engaged listening skills to hear and theorize what farmworkers, growers and others had to say about pesticides.

Figure 5: Teachers, Watsonville Brown Berets, high school students, and their anthropologist (3rd from left). Source: Saxton 2010.

In these ways, ethnographic movement methods are a "way of working" (Ingold 2008:89) and pushing against the limits of traditional disciplinary scholarship and pragmatic forms of solidarity (Farmer 2004; Holmes 2013). They are a process that documents not only how life is for the people we work with, but also provide spaces for imagining and creating alternative possibilities with *compañero/as.* Anthropologists need to routinize not only the application of ethnographic methods but also the synthesization and sharing of methods for research and movements. They represent a conscious turn towards anthropology that is not just "participant observation" but "participatory (re)action" (Maskens and Blanes 2013: 266).

7. Conclusions

Ultimately, the efforts of students, teachers, farmworkers, health care providers, public health specialists, environmentalists, NGOs, concerned rural residents, and their anthropologist contributed, in part, to Arysta LifeScience's decision to voluntarily pull methyl iodide's product registration with the U.S. EPA. In a March 2012 press release, Arysta insisted that the decision had to do with poor sales of methyl iodide in the US and that they would continue to pursue markets for their product in other countries (Arysta 2012). Since then, the company moved from Tokyo to Ireland, taking advantage of lower tax rates for corporations. In 2013, 65 percent of Arysta's sales occurred in their "fast growing markets" in the Global South, and in 2014, Permira sold Arysta for US$3.5 billion (Whiteman 2014).

These changes could be understood as "business as usual" in the political economy of pesticides, as yet another iteration of the "circle of poison" (Weir and Shapiro 1981) wherein products from failed markets aimed at growers and farmers in the U.S. and Europe are then sold in countries with lax environmental regulations and economically vulnerable farmers and farmworkers in the Global South. Still, a number of

promising shifts have transpired following anti-soil fumigant activism on California's Central Coast. Recently a series of articles by the Center for Investigative Reporting have brought the pervasiveness of soil fumigant pesticides to the general public's attention (Bale 2014). Anti-pesticide NGOs continue their work to ban or more strictly regulate these especially toxic and life threatening chemicals (PANNA 2013). While fraught with contestation from the agro-industrial lobby, the U.S. EPA is in the process of revising the Worker Protection Standard governing farmworkers occupational and pesticide safety. Field trials of non-fumigant alternatives to methyl bromide and methyl iodide are ongoing in California and elsewhere. While attending the 2013 Methyl Bromide Alternatives Organization Conference in San Diego, I observed the beginnings of a major shift away from insisting on the inevitable and perpetual use of toxic soil fumigants. Many of the presenters highlighted promising results with bio-pesticides derived from plants, the development of pest-resistant rootstocks, and new approaches to traditional grafting techniques.

Some would argue that we should wait to finalize research findings before putting them into practice. A decolonized approach would counter this with the fact that while researchers are collecting, analyzing, and publishing data, people's lives are at stake (Smith 1999). The work of challenging toxic chemicals also challenges the very structures and logics that govern contemporary society and profit-driven business operations (Brown 2007:39). The relationships between farmworkers lives and pesticides are "life and death matters" (Johnston 2010). Social scientists can and should work towards synchronizing the goals of ethnographic research, writing, and results dissemination and application with the goals of movements. Our priorities and positions of privilege should be mobilized in cooperation with communities wracked by environmental and social suffering. This overview of my activist and anthropological involvement in the California campaign against methyl iodide is one example of how ethnographers and communities collaborate to envision and create alternative agricultural and ecological futures.

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