Article

S|S|S

Social Studies of Science
2018, Vol. 48(3) 331–349

DOI: 10.1177/0306312718783087
journals.sagepub.com/home/sss
SAGE

Toxic politics: Acting in a permanently polluted world

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Abstract

Toxicity has become a ubiquitous, if uneven, condition. Toxicity can allow us to focus on how forms of life and their constituent relations, from the scale of cells to that of ways of life, are enabled, constrained and extinguished within broader power systems. Toxicity both disrupts existing orders and ways of life at some scales, while simultaneously enabling and maintaining ways of life at other scales. The articles in this special issue on toxic politics examine power relations and actions that have the potential for an otherwise. Yet, rather than focus on a politics that depends on the capture of social power via publics, charismatic images, shared epistemologies and controversy, we look to forms of slow, intimate activism based in ethics rather than achievement. One of the goals of this introduction and its special issue is to move concepts of toxicity away from fetishized and evidentiary regimes premised on wayward molecules behaving badly, so that toxicity can be understood in terms of reproductions of power and justice. The second goal is to move politics in a diversity of directions that can texture and expand concepts of agency and action in a permanently polluted world.

Keywords

action, feminist STS, politics, pollution, toxicity, toxic politics

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A toxic world

We take as our starting point a permanently polluted world. The multiple processes by which things become toxic to produce harm have come to represent a ubiquitous, though uneven, condition, mainly due to the tonnage and longevity of industrially produced chemicals. Millions of metric tons of synthetic materials are created, processed and released as effluent every year, built upon extractive industries and their pollutants (Wylie, 2018). All human bodies tested, anywhere in the world, contain industrial chemicals (Cone, 2007; EDAction, 2016; Kallet and Schlink, 1933), though those chemicals affect different bodies differently (World Health Organization (WHO), 2013). This pervasiveness is both enabled by and produces a 'temporality of chronicity and continuity' (Tironi, 2018: 7). Constant exposure to industrial chemicals is paired with the fact that many of these chemicals persist in a geological time frame that exceeds the timescale of the human species, meaning chemical legacies will characterize the planet for both immediate and distant futures (Agard-Jones, 2012; Gray-Cosgrove et al., 2015). For example, the pesticide DDT was banned in most northern hemisphere countries in the 1970s and in all 49 countries in the Stockholm Convention by 1995, but is still found in women's breast milk today (NRDC, 2005; Solomon and Weiss, 2002). Industrially-produced endocrine disrupting chemicals such as flame retardants and plasticizers cause harm generations after exposure, introducing extreme latency into the temporal dimension of this permanently polluted world (Langston, 2010; Liboiron, 2016; Murphy, 2013).

Scholars have described this condition as a 'new age of toxicity' (Walker, 2011: xi), 'the ubiquitous condition of chemically altered living-being, a condition that is shared, but unevenly so, and which divides us as much as binds us' (Murphy, 2017: 497). The new age of toxicity is effectively the 'Anthropocene', because of its permanent, planetary-scale alternations with intimate effects (Bagelman and Wiebe, 2017). Yet planetarity is not to be confounded with generality (Hecht, 2018; Tironi et al., forthcoming). More than just a chemical change, the 'slow disaster' (Knowles, 2014, 2018) of toxicity is located in specific territories and premised upon and reproduced by systems of colonialism, racism, capitalism, patriarchy, and other structures that require land and bodies as sacrifice zones (Civic Laboratory for Environmental Action Research (CLEAR) and EDAction, 2017; Gaard, 2010; Lerner, 2010; Native Youth Sexual Health Network and Women's Earth Alliance, 2016).

The tonnage, ubiquity and longevity of industrial chemicals and their inextricable presence in living systems means that traditional models of action against toxicants such as clean up, avoidance, or antidote are anachronistic approaches to change (Gray-Cosgrove et al., 2015; Nash, 2008). Management via separation, containment, clean up and immunization – the hallmarks of 20th-century pollution control – are premised on a politics of material purity that is no longer available or was never viable to begin with (Latour, 2004; Liboiron, 2016; Shotwell, 2016). Moreover, these modes of action do not address the wider social, political, military and other power structures that engender toxicity to begin with.

A permanently polluted world is one that, because of its deep alteration, reclaims the need to incite new forms of response-ability. What forms of action come to both describe and engender living in a permanently and unevenly toxic world? We, with many others,

seek ways to understand and live in toxicity that includes 'living in prognosis' (Jain, 2007) with orientations to potential futures and pasts, while maintaining a critical view towards larger power structures. With Murphy (2017), we look towards an alterlife, 'a figuration of chemical exposures that attempts to be as much about figuring life and responsibilities beyond the individualized body as it is about acknowledging extensive chemical relations' (p. 497).

We begin this special issue on 'Toxic Politics' by theorizing toxicity and its modes of harm, and particularly how toxicity is produced by and reproductive of different orders of life. Here, we articulate harm as that which disrupts order and existing relations, while also showing that toxic harm also *maintains* systems, including those that produce inequity and sacrifice. Then, we turn to toxic politics – struggles pertaining to power focused on which forms of life are strained or extinguished while other forms reproduce and flourish. We are engaging in a critique of neoliberal, technocratic modes of environmental politics that depend on the capture of social power via publics, democracies, and controversy, and instead focus on those 'minor enfeebling encounters … that stir ethical consideration and potential intervention' (Shapiro, 2015: 369) that star no one, do not produce events or controversies, but that produce ethical relations. The case studies in the articles that make up this special issue both challenge modes of politics that rest on dominant evidentiary representations of harm, and explore less celebrated modes of activism to collectively argue for multiple concepts of toxic politics and reproductive justice in a permanently polluted world. These cases show the deep ambivalences of denunciation of toxicity through charismatic, image-driven or data-driven activism that simultaneously supports the wider structures it denounces (Fiske, 2018). They investigate how the drive to create representations of invisible, toxic, slow disasters by making better, clearer, standardized scientific representations of toxic sensorium never overcomes unevenness and representational resolution (Spackman and Burlingame, 2018). Nor are such forms of evidence required for action (Calvillo, 2018). A pair of the articles in the issue even eschew representational premises for action and instead engage in the mundane, boring, everyday chores of care – cleaning tomatoes and tending plants – demonstrate how toxic politics that do not have publics or controversies manifest (Lyons, 2018; Tironi, 2018). Overall, the articles articulate a range of toxic politics that engender a diversity of justices, scales of agency and relations to power to diversify concepts of what counts as politics in a permanently polluted world.

Toxicity

> Attending to the miniscule yet perturbing somatic transformations of their husbands, [Ms. Morales, Ms. Bernal and Ms. Vega] came to an enhanced appreciation of the scales, sources and consequences of chemical harm in Puchuncaví. (Tironi, 2018: 21)

Toxicity is not wayward particles behaving badly. It is not harm at the cellular level (Braun, 2007; Murphy, 2008; Myers, 2015; Rose, 2007; Schrader, 2010). Toxicity includes these things, but we want to avoid fetishizing and reifying the polluting molecule or particle as the locus of toxicity and toxic harm (Calvillo, 2018). Structures define toxicity. Following Douglas (1988), harm requires 'two conditions: a set of

ordered relations and a contravention of that order' (p. 35). Toxicity is a way to describe a disruption of particular existing orders, collectives, materials and relations. Toxicity and harm, in other words, are not settled categories (Ah-King and Hayward, 2013; Chen, 2012) because what counts as a good and right order is not settled. The trope of toxic politics thus rehearses an analytic for understanding and intervening into toxicity both as an affection/affliction and as an infrastructured and infrastructuring process with power relations and what counts as good and proper relations at its core (Tousignant, 2013). As such, toxicity is not given in advance by nature but is stimulated, constructed, rehearsed and contested through a myriad set of social, epistemological, historical, economic, material, biological and governance systems and structures. Toxicity, as Morales, Bernal and Vega discover as they tend to their dying husbands, has scales, sources and consequences that manifest in situated ways.

To illustrate how toxicity is a system, as well as to demonstrate how systems of toxicity are unique in the 20th and 21st centuries, we find it useful to differentiate between toxin and toxicant. Toxins naturally occur in animal cells (such as venom), plants (such as ricin) and minerals (such as arsenic). While toxins can certainly do political work, from healing to assassination (Burney, 1999), actions such as avoidance, clean up, antidote and care can eliminate or drastically mitigate their effects. Toxins tend to circulate locally and occur in minute quantities, relative to toxicants. 'Toxicant' is a term that arose in English in the 1930s to first describe industrially produced pesticides (Canadian Patent Office, 1935; Ebeling, 1940), as 'toxin' failed to describe emerging industrial chemical relations, particularly at the scales and degree of effect seen in pesticides. Toxicants are characterized by human creation via industrial processes, compositional heterogeneity, mass tonnage, wide economic production and distribution processes, temporal longevity, both acute and latent effects, and increasing ubiquity in homes, bodies and environments (Kallet and Schlink, 1933). Toxicants such DDT (Dichlorodiphenyltrichloroethane) and BPA (Bisphenol A) are created in laboratories (Davis, 2014; Vogel, 2012); toxicants also include minerals that may occur 'naturally' but exist in particular forms, locations, scales and orders of effect because of industrial and capitalist processes, such as lead in urban drinking water (Markowitz and Rosner, 2013; Turner, 2015), arsenic from mining and pesticide application (Balazs et al., 2012; Sandlos and Keeling, 2016) and methylmercury from industrial-scale damming (Durkalec et al., 2016). As such, toxicants are engendered by specific systems, including industrialization, economic growth and capitalism.

Rather than an unintended by-product of these systems, toxicity and pollution are central to them (De Angelis, 2014; Ofrias, 2017). In economics, toxicants in the wild are called externalities, entities that escape the cost and profit calculations of business accounting. But toxicants also 'produce "invisible opportunities" for capital accumulation and other consolidations of power' (Ofrias, 2017: 16), such as through dispossession of land via 'accumulation by degradation' where land is lost and gained because of its contamination (Johnson, 2010; Leifsen, 2017; Lyons, 2018; Perreault, 2012), the production of race and racism via differential contamination (Bullard, 1993; Pulido, 2015, 2016; Voyles, 2015) as well as gender differences via care roles and 'domestic' epistemologies of everyday toxicity (Kimura, 2016; Scott, 2015; Tironi, 2018), and heteronormativity via discourses of what counts as toxic reproductive harm (Ah-King and

Hayward, 2013; Di Chiro, 2010; Scott, 2009), among many other examples of how pollution and toxicity accrue value and meaning to dominant structures, even as many acts of environmental activism aim to challenges those same structures.

Dominant measures of toxic harm are primarily enabled and defined by international organizations (such as the World Health Organization) or the state and its economic and scientific systems. Nearly all existing environmental regulations and laws around toxicants are based on threshold limits – normally measured in relation to effects on human bodies (Cram, 2016). A certain amount of a toxicant is allowed to enter bodies and environments, such as 0.002 mg of mercury per liter of drinking water (US EPA, n.d.) or five micrograms of lead per deciliter of human blood (US EPA, 2017). Threshold limits assume that ecosystems and bodies can assimilate a specific amount of toxicant before harm occurs (Liboiron, 2013; Vogel, 2012; Walker, 2000). Based on these thresholds, toxicants are systematically and legally allowed in water, environments and bodies via regulatory structures. The United States Environmental Protection Agency's 'most important function … is to establish National standards that govern how much pollution is *allowable*' (Davis, 2014: 2, emphasis added). This is true of almost all environmental laws developed since the 1970s (Boudia and Jas, 2014; Cram, 2016; Davis, 2014; Jas and Boudia, 2015; Walker, 2000). In the early 1920s and 1930s, when toxicants were first being articulated, so too were scientific and technocratic concepts of chemical and radiological harm and their attendant infrastructures of protection and risk. Whether focused on filtration, chlorination or radiation protection, costs to industry and the state were a key part of discussions (e.g. Cram, 2016; McGuire, 2013). Today, in addition to threshold limits of chemical harm, mitigating the costs of pollution emission control to industry within pollution regulation manifests itself in cost-benefit metrics such as 'As Low As Reasonably Achievable' (ALARA) radiation measures, which '[takes] into account the state of technology, the economics of improvements in relation to state of technology, [and] the economics of improvements in relation to benefits to the public health and safety' (Health Physics Society, n.d.). Similarly, 'Best Available Technology Not Entailing Excessive Costs' (BATNEEC), now called simply 'Best Available Technology' (BAT), is a framing concept in the regulation of some forms of pollution in the European Union, Canada and the United States, among other nations (Currie, 1980; Sorrell, 2002; Westman, 1972). It is a measure that 'includes excessive costs in its definition of "available"' (Sorrell, 2002) so that definitions and thresholds of chemical toxicity do not cost industry more than it can afford; levels of toxicants are set to affordable technologies, because technologies that allow fewer toxicants to escape would be too expensive. Thus, while toxicity might disrupt cellular, organ, organism or population health, these definitions of toxicity also maintain the economic status quo.

Based on these examples, where technocratic definitions of toxicity and toxic risk are based on specific quantities of allowable pollution or BAT, we can refine our earlier theorization of toxicity. More than just the contravention of an established order within a system, toxic harm can be understood as *the contravention of order at one scale and the reproduction of order at another*. Chronic low levels of arsenic in water interrupt the reproduction of fish, but maintain the ability of mining companies to store mining tailings in open air mounds (Sandlos and Keeling, 2016). The disruption of order on one scale to consolidate order at another is characteristic of many forms of violence (think of

homelessness, gentrification and war). Toxicity is a specific genre of harm that is about ordering *living* systems, broadly defined to include scales from cells to ways of life (e.g. Lyons, 2016).

Toxicity, then, describes the organization of reproduction – what thrives, what is altered, what 'persist[s] and redistributes[s] into the future' and 'what is destroyed, injured, and constrained' both as a premise for other things to thrive, but also as a marker of difference and indifference (Murphy, 2017: 141–142). When we talk of toxic politics, we mean reproductive justice: 'the struggle for the collective conditions for sustaining life and persisting over time amid life-negating structural forces, and not just the right to have or not have children. Reproductive justice is thus inseparable from environmental justice, antiracism, and anti-colonialism' (Murphy, 2017: 142; see also Hoover, 2017; Hoover et al., 2012; SisterSong, 2012). Toxicity is a way to focus on how forms of life and their constituent relations, from the scale of cells to cultures, are enabled, constrained, and extinguished within broader power systems.

Politics

Different politics result in different definitions and manifestations of toxicity, and vice versa. To begin our discussion of toxic politics, we want to foreground the genre of politics we are not pursuing: science-based policy within liberal democracies. This is not to say that policy, democracy and evidence-based decision making should be abandoned, but that as existing dominant ways that experts and academics think about action in a toxic world, they do not need to be taken up by yet another special issue (see excellent edited collections on this via Boudia and Jas, 2014; Jas and Boudia, 2015). Moreover, policy and democracy, with or without scientific facts, are incomplete and insufficient as modes of action against toxicants – they are clearly neither working nor accessible to a wide variety of people and groups, as the case studies taken up in this special issue attest. Moreover, as the section above on toxic systems argues, the state and its related systems are part of the structure of toxicity that allows the ubiquity and tonnage of toxicants to be produced and circulate in the first place.

This does not mean the papers in this volume eschew governance, science or policy. On the contrary, most refer to all three. We are 'hesitant to altogether dismiss people's attempts to contest the law of the state or to seek normative modes of corrective power' (Lyons, 2018) given that science, policy, and democracy are dominant modes of ordering the world (Calvillo, 2018). They are embroiled in most of the case studies of toxicity in this issue as well as how most modes of agency against toxicity are encountered and understood. Indeed, science and regulation are what define toxicity in dominant discourses and thus are obligatory passage points that must be accounted for when evoking or challenging these dominant notions of toxicity or other futures. As Boudia and Jas (2014) write,

> '[w]hile scientific knowledge has not made it possible to truly protect populations, it has retained a key position within all public debates – particularly because it is still essential in the identification and characterization of toxicants as well as in public legitimization of different policies'. (p. 2)

At the same time, none of our authors pursue science-based policy as an ideal mode of action for toxic politics. They instead unearth other modes of action that are often missed or dismissed as possible ways to expand environmental politics. Indeed, following Gibson-Graham's (1997) argument that non-capitalist and anti-capitalist processes are uneven and patchy but ubiquitous within capitalism (1997), our interest is in examining cases that enact toxic politics within but beyond governance-via-policy, in-the-streets-activism and science-as-usual. Tironi, Lyons and Calvillo make the point that these other activisms (if we may call them that) are also always already at work within, against, in tandem with, and despite existing state-sanctioned and state-recognized genres of toxic politics.

In support of unearthing other toxic politics, we do not call for the formation of democratic publics, either. While some papers in this issue touch on the connections between the formation of publics, evidence and controversies, especially as public controversy is one of the main modes of analysis of toxic political action, they are part of a critique of 'narratives of action, mobilization and publicness' (Tironi, 2018: 4). This is in part because, in Tironi's and Lyons's cases, 'politics is not about debates and argumentation but about the white noise of chronicity, while the composition of a common world often means surviving, coping and resisting' (Tironi, 2018: 26; also Tironi and Rodríguez-Giralt, 2017). In Fiske's (2018) work, these 'narratives of action, mobilization and publicness' (p. 1) are appropriated, and in part strengthen rather than subvert systems of power that allow oil extraction and its effluents (and affluence) to continue. This move away from democratic and liberal modes of action and their 'future-oriented obsessions with capturing social power' (Lyons, 2018: 13) makes room for other types of action and what counts as politics, so that they no longer privilege the modern humanist political subject and epistemologies based in claims and counter claims.

Likewise, we do not call for oppositional events. Shapiro (2015), Simpson (2011) and Papadopoulos et al. (2008) have argued that a fixation on 'sublime, public and argument-oriented situations, temporalized in the excitement of the "conflict", [has] defined politology' for a century (Tironi, 2018: 26; see also Luneau, 2013). Rather than understand politics through charismatic events with hard edges and ready narratives, we follow others in STS who have argued that conventional studies miss politics as a precarious and pragmatic achievement (Barry, 2001; Marres and Lezaun, 2011). We seek both to see how these precarious and pragmatic achievements continue to reproduce some forms of life at the expense of others, as well as look to another kind of politics 'flourishing, amid blasted landscapes and lives' (Tironi, 2018) and another kind of political achievement based in things other than coherence and accomplishment – as the variety of non-coordinated, diverse and temporary responses to institutional manipulation of air pollution data in Calvillo's (2018) case illustrates.

Representation

One of the ways scholars have described the temporality of a permanently polluted world, particularly in terms of the chronicity and latency of chemical toxicity, is to describe it as 'slow disaster' (Fortun et al., 2016; Gray- Cosgrove et al., 2015; Knowles, 2014, 2018). In contrast to the event-based disasters that garner the most attention, slow disaster and slow violence occur,

> gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all. Violence is customarily conceived as an event or action that is immediate in time, explosive and spectacular in space, and as erupting into instant sensational visibility. We need, I believe, to engage a different kind of violence, a violence that is neither spectacular nor instantaneous, but rather incremental and accretive, its calamitous repercussions playing out across a range of temporal scales. In so doing, we also need to engage the representational, narrative, and strategic challenges posed by the relative invisibility of slow violence. (Nixon, 2011: 2)

Leaks, leachates, chronic exposures, decaying infrastructure, ocean acidification, and climate change are slow disasters. Their harms are amorphous and do not register easily within regulatory metrics. Their scales are too large or too small to observe directly. They are not readily manifested.

Because of their resistance to ready representation, one common way to bring slow disaster into focus and action is to make it legible as an event (DeLuca, 2012; Peeples, 2011). Greenpeace drops banners from bridges, photographers take pictures of starving polar bears on shrinking ice floes, and in Fiske's case study in this issue, a bare hand is held up, dripping with Chevron's oily waste left behind in the Amazon. The dripping hand is the icon of the La Mano Sucia de Chevron (The Dirty Hand of Chevron) campaign, which seeks 'to enroll supporters in efforts to hold Chevron accountable for decades of environmental damage' in Ecuador (Fiske, 2018). Though local activists and residents repeatedly dip their hand into Chevron's waste pits for media and toxic tours, and though their bodies bear the marks of contamination-related diseases that they narrate for cameras over the course of years, it is the aloft dirty hand of President Correa and other celebrities who come to visit the waste pits and lend their support to the environmental campaign that come to define Chevron's toxic trespass. Bodily harm is appropriated. No one becomes 'empowered' here (as though power can be bestowed). Instead, Fiske (2018) describes the 'complexity of denunciation' and particularly 'the appropriation of practices and knowledges born out of environmental suffering by those in positions of power, even when seemingly used for good'. The case of Chevron's dirty hand shows how 'the same gesture does different work in revealing toxicity and complicity – work that depends on the position of the bearer to the burdens of pollution and the benefits of extraction' via the 'profoundly asymmetric relationships to the toxic entanglements that oil produces' (Fiske, 2018).

Appropriation is structural, rather than accidental, in state-based environmentalism. Coulthard (2014: 3) has warned that state recognition – the sought-after effect of representations of slow disaster and suffering – can solidify 'models of liberal pluralism that seek to "reconcile"' assertions by activists with the goals and structures of the state, including the incentive to contaminate (Ofrias, 2017). Likewise,

> justice appears as a problem concerning the ways in which broad social struggles are rewritten, often by state and legal institutions, as 'things' with protocols and procedures designed to respond to – and often limit – social claims. What is so vexing is the tendency for these institutionalized approaches to not only miss their mark but also to enable, rather than constrain, the unjust actions that initiated the struggles in the first place. (Barkan and Pulido, 2017: 35)

Legibility via recognition, through sensational images or otherwise, has inherent potential to reproduce forms of politics that maintain the difference between center and periphery, who is heard and not heard, and 'what forms of life are supported to persist, thrive, and alter, and what forms of life are destroyed, injured, and constrained' (Murphy, 2017: 142).

The papers in this issue shift the focus from the *evidentiary* aspect of evidentiary regimes to the structure of *regimes*. 'Regime' is a macro-level concept that seeks to describe how institutions maintain rights and rules that determine what is 'considered valuable by society, that lay down the principles of valuation, and that resolve the resulting value conflicts' (Gille, 2010: 1056), even in moments of toxic contest. Recognition and legibility are two ways that power structures that produce toxicity persist and are even reproduced during environmental campaigns. Lyons's case study in this issue chronicles how the articles of evidence for crops killed by state-dispersed insecticide – aerial photographs, dead plants, government forms – are unconvincing to officials as evidence of toxicity even as they are 'correct' at the scale of the farm. The result is the acute futility of evidence-based gestures by local farmers, since their capacity to create credible claims falls outside of the prime principles of state valuation and validation, even while providing the exact (but never exact enough) forms of evidence requested by the state. On the side of power, toxic politics allow the flourishing of some forms of life by defining toxicity through regimes of evidence, such as the failed attempt of the Madrid government covered in Calvillo's case. This is not to say there is a politics that does not reproduce oppressive or powerful structures in some way. Rather, reproducing some aspect of the very system being challenged is a characteristic of activism (Fortun, 2009; Hale, 2006; Liboiron, 2017). Our argument is that representational acts within evidentiary regimes always produce uneven effects (Spackman and Burlingame, 2018). When unevenness is often used as a hallmark characteristic of toxic politics, it usually refers to uneven distributions, benefits and harms of the production and disposal of toxicants (e.g. Bullard, 1993; Commission for Racial Justice, United Church of Christ, 1987). Here, toxic unevenness also describes how evidence circulates within evidentiary regimes – how harm means that some orders are upset while maintaining other orders at other scales.

A complementary impulse to making slow disaster apprehensible through legible representations is to make environmental representations better – less available to appropriation or misunderstanding, less ambivalent, less uncertain:

> Scientists, activists, and policymakers advocate for higher resolution climate models and more complete descriptions of the locations and effects of marine plastics, or radiation drift from Fukushima, or extreme weather. Bigger, better, clearer pictures are the key to informed action. They account for more variables, simulate more mechanisms, and inform the construction of better models that reflect our total understanding. (Robles-Anderson and Liboiron, 2016: 248)

Regardless of critiques of certainty, God's-eye understandings or fidelity, representations are inextricably linked to action. In this issue, Fiske, Lyons, Calvillo and Spackman and Burlington address this nexus of representation and politics – the types of action possible, the very possibility for action, and what is recognized as political action. They ask

what modes of knowing are fore-fronted when toxic politics are defined following the parameters of action, visibility (or smellability) and will? These authors draw on Murphy's (2006) regimes of im/perceptibility, where 'the way a discipline or epistemological tradition perceives and does not perceive the world', including its instruments and other representational practices, makes some things sensible and others insensible (p. 10). Here, toxic politics is the partition of the sensible (Rancière, 2005) by and with the potentiality of an otherwise (Povinelli, 2011; Stengers and Pignarre, 2005). Fiske's case of bringing bodily knowledge and symbols into legal campaigns (appropriated as they are), Lyons's concept of *sentiactuar* (feeling-acting) that exceeds state evidentiary regimes (also see Watts, 2017), Calvillo's *attuned sensing* to qualitative conditions of toxicity, and Spackman and Burlington's (2018) history of how using smell to indicate water quality became standardized in terms that were abstracted and expert, rather than accessible to laypeople, collectively contribute to growing body of research on how epistemology is tied to toxic politics in terms of what Spackman and Burlington (2018) call a *sensory politics* (p. 7): the role of sensory epistemologies, broadly defined, in action (see also Andrews, 2015; Keichle, 2017; Shapiro, 2015).

One of the collective strengths of this work is that rather than treating the body as an epistemological antidote to regimes of perceptibility and evidence, it shows that 'gestures of "bodily knowledge" … are not always the uncomplicated evidentiary claims they might seem to be' (Fiske, 2018). In Fiske's case, bodies that live and die in toxicity are easily swapped out for celebrity bodies that visit toxicity. Spackman and Burlington (2018) show that both human noses and standardized instruments result in unique problems of unevenness, credibility and regimes of perceptibility. In Calvillo's (2018) case, attunements to toxicity occur at a distance, focusing 'not so much [on] pollutants as [on the suggestion] that the health of some citizens matters more than that of others'. Simply trading bodies for technologies (or technologies for bodies),

> 'is never simply about speaking the "truth" or providing a "local account", nor is it only about the "opening up" of science and politics to new forms of knowledge production. Rather, it can perpetuate forms of structural violence and create new toxic burdens … even when dedicated to condemning environmental injustice' (Fiske, 2018).

As such, these pieces work to dispel the myth that more, better, clearer, affective, localized, and/or embodied representations will lead to more, better, clearer, effective, local and embodied action.

Ethics

In Puchuncaví, Chile, a woman goes out to her tomato plant every morning (!) to wipe chemical ash from its leaves, even though there will be more tomorrow (Tironi, 2018). The tomato will never be clean. This action is based in a politics not of effectiveness or change, not in purity or a shared commons, but in obligation and ethics.

If a permanently polluted world is characterized by chronic slow disasters – incremental and attritional violence that stars no one, and fails to manifest in an event or clear-edged representation (Nixon, 2011) – then a complementary form of politics is

slow activism, which is also incremental and attritional, stars no one, and is not premised on nor produces events or clear-edged representation. Slow activism describes some of the political and representational tropes that eschew immediate visible and measurable outputs, such as changing policy or stopping trucks from entering a drilling site. Slow activism does not literally mean actions are sluggish (though they can be), but that but that the effects of action are slow to appear or to trace, such as the change in an ecosystem that allows butterflies to return, as in Lyons's case, or the coping with and survival through the everyday over decades as in Tironi's case, or the making of air pollution as a collective issue over the course of years, as in Calvillo's case. Slow activism does not have to be immediately affective or effective, premised on an anticipated result. It can just be good.

Following feminist science studies, politics can be understood as a space of ethics, as the proposition of social projects in which life flourishes through obligations and solidarities among diverse collectives, human and otherwise (e.g. Puig de la Bellacasa, 2010; Tsing, 2014; Watts, 2017; Wilson, 2008). While toxicity is embedded in multifarious relations of power, it also has the potential to invent alternative political relations: The precariousness of toxic worlds enables the formation of resistances, coalitions and practices that expand the inventory of what politics means and does in late industrialism. Toxic politics as we imagine them are not about 'how much' toxicant or even 'what' chemical, but the why and how it is it is encountered, by whom, and to what end (Shapiro et al., 2017; Watts, 2017).

In this issue, Tironi and Lyons provide examples of slow activism based in ethics rather than effects. Tironi (2018) calls 'the type of ethical response to pervasive chemical harm that emerges through domestic practices of care and that situates politics at the intersection between passiveness and action, coping and contesting, reclusion and mobilization, feeling and knowing' a form of 'intimate activism'. Wiping a tomato plant's leaves and tending to dying husbands form a politics made up of 'mundane yet purposeful doings', or 'hypointerventions'. Likewise, Lyons's (2018) informant, Pedro Pablo, explains that his farming in a toxic landscape 'is a kind of social and environmental justice in contrast to the justice of the state that fumigates us without considering our *sentir* [what we feel]', what Lyons terms *sentiactuar* (feeling-acting). Both intimate activism and *sentiactuar* foreground the everyday, obligatory practices of tending to plants and others as toxic politics that do not necessarily result in scaled-up material change, but constitute material ethics at the immediate scale. '[S]he perseveres. She has no expectations, but she does not foreclose the possibility of an otherwise' (Tironi, 2018). But intimacy and feeling are not the only hallmarks of slow activism. Calvillo's case foregrounds an accumulation of uncoordinated, temporary and incommensurate actions, from writing blog posts to threatening to sue governments . These various case studies of slow activism as toxic politics are a contribution to a body of work that challenges activism as heroic, event-based and coherent:

> Idealized portraits of advocacy represent a certainty that is resolutely at odds with how environmental problems materialize on the ground, in continuing negotiations over what is real, what is past, and what is to come. Described in ideal terms, the advocate is never seen enmeshed in discrepancies, ambiguities, and paradox. Nor is he seen trying to force fit the

> world into available political ideologies. … Idioms for ethics without full knowledge remain undeveloped. (Fortun, 2009: 52)

Ethics, rather than an anticipated result, is at the core of slow activism. Like concepts of survivance (Vizenor, 1994), weapons of the weak (Scott, 2008), palliative care, coping, frustration and futile gestures, agency operates in a system that has already been identified as acutely constraining and harmful, so actions are not necessarily about changing the system (though they can be) so much as existing in it (and sometimes challenging it) ethically. This genre of toxic politics theorizes agency as obligation, rather than as effective outcome (see also Todd, 2016; Watts, 2017; Wilson, 2008).

Agency-as-obligation, as ethics, is a key way to move toxic politics away from narratives of suffering that essentialize those who bear the disproportionate burdens of harm as victims. Intimate activism, *sentiactuar*, and other slow activisms can avoid or mitigate the negative impact of 'damage-centered' research,

> research that intends to document peoples' pain and brokenness to hold those in power accountable for their oppression. This kind of research operates with a flawed theory of change: it is often used to leverage reparations or resources for marginalized communities yet simultaneously reinforces and reinscribes a one-dimensional notion of these people as depleted, ruined, and hopeless. (Tuck, 2009: 409).

The woman in Puchuncaví who cleans her tomatoes every day is 'not a healthy citizen emancipated from the various inequities to which she has been subjected, but neither [is she] a numbed subject doomed to suffer with conformity the chemical and political violence of Chilean industrialism' (Tironi, 2018). The 'otherwise' here is not a promise of clean-up or industrial repatriation of health and life, but is born of obligation and desire to maintain a way of life, which can

> 'yield analyses that upend commonly held assumptions of responsibility, cohesiveness, ignorance, and paralysis within dispossessed and disenfranchised communities. Desire, yes, accounts for the loss and despair, but also the hope, the visions, the wisdom of lived lives and communities. Desire is involved with the *not yet* and, at times, the *not anymore*'. (Tuck, 2009: 417)

without having to resort to a heroic liberal subject. When we say that certain forms of life ought to be able to reproduce within blasted landscapes, this is one version of what we mean (see Lee, 2016).

Justices

We have not offered a prefigurative toxic politics. The cases in this special issue suggest forms of action that blur the difference between activism and everyday practices, and how acting in a toxic world does not have to pass through the production of evidence or counter-evidence. Some papers suggest that action and ways of knowing may be productively conjoined (Calvillo, 2018; Spackman and Burlingame, 2018 see also Murphy, 2006; Shapiro, 2015). They offer forms of intervention that may sound counter-intuitive,

such as cleaning when there is no chance for cleanliness (Tironi, 2018) or farming on toxic land (Lyons, 2018), or forms of intervention that may sound useless, such as writing a blog post or putting a placard in front of a playground (Calvillo, 2018). They examine well-intentioned environmental activism that turns slow disaster into an event so it may be understood as harm (Fiske, 2018) or standardized as knowledge (Calvillo, 2018; Spackman and Burlingame, 2018). They curtail calls to action that are well-worn and premised on a liberal agent: reduce, reuse, recycle; dilution is the solution to pollution; clean up your own mess; more studies are needed. Together, but incompletely, these cases ask what toxicity is – what orders of life are strained and which are reproduced – at the same time as they ask what politics means and how it is enacted in the face of ubiquitous and inapprehensible industrial damage, including what actions enable basic conditions to live and die well.

If one of the reasons the natural and social sciences and humanities have turned to the figure of the Anthropocene is because it describes a condition in which current ways of life (human and otherwise) are no longer able to continue their recent path, then concepts of politics and polity based in those ways of life also will change. Yet we do not offer a call for a new form of toxic politics or offer exemplars of prefigurative slow activism that should be taken up. Indeed, the cases and frames for action discussed in this special issue should not be fetishized themselves, as they are deeply situated, but they do offer a repertoire of action that is often left out of stories of success and resistance in toxic worlds. They show how there are 'multiple, even incommensurable, variations of justice' (Lyons, 2018; see also Fanon, 1963; Tuck and Yang, 2012; Watts, 2017). These justices occur or are imagined at fundamentally different scales, with different modes of agency and different configurations of toxicity. We seek to make room in dominant political imaginations for multiple forms of local, low resolution, uneventful, uneven, frustrated, desireful, ethical, appropriated and incommensurate forms of justice given a permanently polluted world.

Acknowledgements

The editors would like to thank the many people who helped shape this special issue: Sergio Sismondo, Nicole Nelson, Les Levidow, and the many anonymous reviewers who dedicated their time and expertise to the project.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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