
INTRODUCTION

Pollution and Toxicity

Cultivating Ecological Practices for Troubled Times

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Plastic bags ride the currents of the Pacific Ocean and collect in the Mariana Trench; stockpiles of nuclear waste are pumped deep into Earth's outer crust; smoke and smog (a fusion of particulate matter and ozone) settle in above sprawling urban colonies, slowly killing their denizens; spent oxygen canisters join "forever chemicals" on the snows of Everest; and billions of pieces of space debris endlessly fall in Low Earth Orbit, just beyond a thin and rapidly changing breathable atmosphere. So goes the narrative of the Anthropocene, a purportedly new geological epoch demarcated by the planetary effects of human activity.

The symbolic anthropologist Mary Douglas (1966) understood pollution as "matter out of place," a kind of disorder that necessarily prompts efforts to "organize" the environment. Anthropologists, geographers, and other social scientists have since pushed the conversation forward by inquiring into the materiality of pollution, the toxicity that manifests in situated encounters between bodies and environments, and the co-production of pollution/toxicity—two sides of the same coin, one overflowing boundaries and the other seeping in—through those extended networks of physicochemical, organic, and sociocultural life that constitute local and global political ecologies.

This issue of *Environment and Society* explores current thinking about pollution and toxicity at the intersection of political ecology, symbolic anthropology, and science and technology studies. The articles address a broad range of scholarly perspectives, theoretical alliances, and methodological and epistemological approaches. They collectively contribute to historical and contemporary framings of pollution and toxicity and to new understandings of their discursive and material co-production, and they outline the stakes of such an analysis for diverse communities of human and nonhuman beings. Authors in this issue address entangled themes such as the materiality of pollution/toxicity, how it is smelled, tasted, felt, experienced, embodied, or symbolized, both in moments of crisis and in daily life. Articles also home in on how and by whom the impacts—material, sociocultural, political, ethical, etc.—of pollution/toxicity are measured or otherwise accounted for technoscientifically, socioculturally, and historically. These accountings mediate governance mechanisms through policies, infrastructures, and ordinary acts of care and containment (sweeping, cleaning, planting, repairing). Finally, authors consider how pollution/toxicity reshapes sociopolitical life.

Rather than formulate a unified new theory of pollution or toxicity, the articles in this issue reflect the "troubled ecologies" (Besky and Blanchette 2019) of late industrialism through a



broad range of scholarly perspectives, theoretical alliances, and methodological and epistemological approaches. In doing so, they demonstrate the value of juxtaposition, counterpoint, and interference. In these troubled ecologies, theory, activism, and historiography must work toward a form of collaboration that refuses totality or finality (see Haraway 2016). Even as they all claim space for the value of critical social science in addressing pollution/toxicity, the authors describe experiences that are perhaps best seen as belonging to the larger whole that Isabelle Stengers (2005) calls an “ecology of practices,” in which distinct approaches may diverge but remain sensitive to and aware of the others, thus sharing something in common. What we find most generative about the collection is the multiplicity of approaches to the scholarly task of “literature review.” Authors draw inspiration from (among others) feminist theory, Indigenous and Black studies, applied anthropology, critical geography, political ecology, STS, as well as the praxis of environmental justice activists.

For example, three articles in this volume—by Yogi Hale Hendlin, Daniel Renfrew and Thomas W. Pearson, and Liza Grandia—touch on a troubled web of questions surrounding per- and polyfluoroalkyl substances (PFAS), drawing on distinct methodological approaches and theoretical frameworks. PFAS are called “forever chemicals” because they leach from Teflon products, food packaging, and waterproof clothing to persist in soils, water, and bodies in perpetuity. As “the slipperiest chemical[s] in existence,” PFAS both embed themselves in organisms and environments, even as they resist conventional modes of critical analysis (Bond 2020). In Hendlin’s article, chemicals like PFAS are entangled in sociotechnical imaginaries, carefully crafted by the chemical industries to prioritize their own economic imperatives over the warnings of public health experts. Such industries construct spaces of denial, doubt, and acceptable collateral damage regarding exposure. Meanwhile, Renfrew and Pearson shift toward an ethnographic accounting of the social experiences and responses to the emergent chemical harm of PFAS, showing how routinized toxicity comes to be collectively resisted. By charting the growth in lay awareness as well as the production of knowledge and ignorance about toxicity, they highlight the recent processes and conditions through which PFAS contamination shifts from being largely invisible and normalized into what they describe as a “toxic event.” Such events are “ruptures to everyday life that reorient lived experience and serve as a platform for the generation of new forms of subjectivity and, potentially, rights claims.” Lastly, Grandia provides an autoethnographic exploration of how PFAS join adhesives, perfumes, dyes, and other low-level toxicants to shape everyday existence. She highlights how, even in spaces of relative affluence like universities, the embodied knowledge of “canaries,” including people with multiple chemical sensitivities, can catalyze new forms of political resistance.

Each article in this issue incites critical investigation of the temporalities of environmental violence. Drawing on Rob Nixon’s (2011) insightful cautionary reflections on both the local expressions and global manifestations of slow violence, some of the articles examine the intersecting temporalities of pollution and toxicity. Critical attention to the deep, convoluted relationships between chemical harm, settler colonialism, empire, and racial capitalism challenges simplistic or straightforward vectors of blame. As Melina Packer puts it (this issue), following the work of Sariya Boudia and colleagues (2018), much of what constitutes toxic harm is the product of “remains” and “residues,” the leftover detritus of futures that were imagined and enacted in the past (Fortun 2012). Packer’s critical feminist approach to the literature highlights the troubling ways in which the very scientific basis on which toxicity becomes knowable is troublingly bound up in the long tail of empire itself.

The residues of futures past are the subject of Hannah Hunter and Elizabeth Nelson’s (this issue) provocative look at space debris. With an emphasis on speculative futures, they encourage readers to refine their thinking about the scope and breadth of Earth-based environmental

toxicity. Their work cautions against colonial framings of space, as wild worlds beyond Earth, as empty, *terra nullius*—colonial, militaristic framings of space as “sacrifice zones”—and call for speculative imaginings of these spaces in otherworldly terms.

All of this, as the articles in this issue demonstrate, means that the kind of political ecology that has been so useful in identifying the violent consequences of conservation or urbanization (Peluso and Watts 2001; Rademacher 2015), for example, is less capable of accounting for toxicity. One reason for this is that the technoscientific process of petroleum extraction drastically differs from that of waste management or pesticide application. For example, in their examination of pesticides in Africa, Serena Stein and Jessie Luna (this issue) alert the reader to the legacies of toxic colonialism and its reach into the Global South. In fleshing out the concept of a “toxic sensorium,” Stein and Luna’s work resonates with Grandia’s and draws attention to the unique ways in which bodies become sites of knowledge about toxicity as a kind of double engagement: on the one hand, they are wounded by toxic environments, and on the other, they are empowered by them for social mobilization and change.

Social mobilizations for environmental justice, much like pollution and toxicity itself, are historically situated phenomena. Michael Mascarenhas and colleagues (this issue) explore the link between environmental racism and racial justice movements in the United States. As the literature suggests, the relationship between race, poverty, and the siting of hazardous waste facilities is more than an artifact of data capture. It is a causal effect in which polluting industries follow the path of least resistance. At the same time, grassroots organizing and community-based efforts to lay bare those connections were historically instrumental for prompting governmental action.

There is great need to nuance the vulnerability narrative of harm for those affected by environmental injustices in their everyday lives; rather, readers must attend to sites of injury as “sites of action, creativity, and possibility—not only as landscapes of waste, toxicity, and ruin” (Powell 2018: 17). These authors delve into ethnographic advancements of experiential environmental injustices in situated sites, places, and communities. They do so with a focus on embodied toxicities, embedded landscapes, and community processes and identify how research collaborations can offer spaces for thinking through problems and questions of justice. Their work articulates the conditions of a “double force of vulnerability,” highlighting stories of sustained suffering, where life is rendered precarious, and simultaneously presenting possibilities for solidarities and collective action.

When engaging with Indigenous communities, ontologies, and epistemologies, questions of sovereignty and self-determination are critical to the interrogation of vulnerability and to the project of envisioning and upholding lives otherwise (Yazzie 2018). An investigation of the “justice” in environmental justice calls for thinking with communities. It requires an orientation to policy and action that moves beyond critique, and, indeed, beyond narratives of “damage” (Tuck 2009). As Noah Theriault and Simi Kang (this issue) suggest, research itself, through collaborative, engaged, experiential, decolonial modes of engagement, may render toxicity into a kind of method, one that recognizes that, as toxicants (re)make bodies, space opens for a kind of reparative politics that refuses the possibility of a return to Douglas’s “purity.” Such reparative work is not fully divorced from older forms of environmental justice, but it is distinct. Theriault and Kang’s article is in generative conversation with Brittany Kiessling and Keely Maxwell’s (this issue) reading of the literature on environmental remediation, as well as with Alexa Dietrich’s (this issue) call for more productive collaboration between different anthropological approaches to disasters. Kiessling and Maxwell recognize that remediation efforts, while publicly funded and “science”-driven, nevertheless engender new politicized socialities. Even the process of cleanup, it turns out, is a deeply messy one. Dietrich’s review takes up the example

of the multiple, “cascading” disasters that have unfolded in spaces of colonial and corporate dominance, such as Puerto Rico, to highlight both the underappreciated creativity of community-based actors and the continued challenges of dismantling silos of scholarship and praxis.

This collection contributes to emergent understandings of the discursive and material co-production of pollution and toxicity, as well as to the stakes of such an analysis for diverse communities of human and nonhuman beings. If, as Douglas (1966) once noted, pollution is “matter out of place,” contemporary engagements with pollution/toxicity no longer aspire for spaces of purity, nor do they seek to extract the analyst from the whole mess (Nading 2020; Shotwell 2016). Rather, these engagements reflect a need to cultivate ecological practices for and in deeply troubled times. They will bring together physical and social scientists, policy-makers and practitioners, environmental activists, and Indigenous communities in ways that facilitate new conceptualizations of pollution, toxicity, and environmental justice. They will also stay with the troubled ecologies, through which new possibilities for collaboration, remediation, or reflection are cultivated.

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