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ARTICLE

Fables of Response-ability: Feminist Science Studies as Didactic Literature

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Abstract

Recent literature in feminist science studies is rich with stories about how we are constituted by and in relation to (sometimes toxic) chemicals. Scholars such as Natasha Myers, Mel Chen, and Eva Hayward have written vivid accounts of the chemical ecologies of late industrialism, arguing that we cannot think of bodies as separate from environments. In this article, I read feminist scholarship on chemical ecologies as *fables of response-ability*, stories that teach us to attend and respond within our more-than-human world. Amplifying their didactic registers, I pay attention to moments in the texts that are speculative, poetic, and personal, moments that work on the bodies, imaginations, and sensoria of their readers. By reading these texts together, I hope to both acknowledge the didactic work that feminist science studies scholars are already doing and encourage others to experiment with telling their own fables of response-ability.

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Introduction: Reclaiming the Didactic

Thinking back on my favorite articles in feminist science studies—Donna Haraway's "Situated Knowledges," Emily Martin's "The Egg and the Sperm," or Siobhan Somerville's "Scientific Racism and the Invention of the Homosexual Body," for example—it is their *didactic* qualities that I admire most. Not only as a classroom teacher but also as a reader, and someone who was once a student, I am compelled by writing that teaches us to attend and respond to the politics of scientific knowledge-making practices.

Didactic, of course, is usually intended as a pejorative, not a compliment; it is a word that critics reach for when they want to dismiss a work of art as moralizing and patronizing to its audience. Didactic always means *too* didactic. There are, however, no positive adjectives for work that intends to teach. We have *preachy* but not *teachy*. *Pedagogical* is a mouthful. And *educational* is too much like *nutritious*—signaling something joyless but good for you. In the absence of another word, why do we continue to use the word *didactic* only as an insult, as if teaching should never be the goal of writing, scholarship, or art? The implication is that when art tries too hard to teach, it necessarily fails on all other aesthetic counts. However, as anyone who has ever been a teacher knows, aesthetics are often the medium of pedagogy. Charismatic texts—texts that are stylish, funny, vivid, poetic, or wry—have the incredible power to grab ahold of their readers and compel us to see, feel, think, and relate differently. In this article, I suggest that we embrace these didactic qualities in feminist science studies scholarship, qualities that often go unexamined when we talk about academic writing.

The prevailing negative associations of *didactic*, I believe, are consistent with the way that teaching is both gendered and devalued in contemporary American culture. This attitude will be familiar to any teacher who has heard the awful phrase (often spoken directly to one's face), "Those who can't do, teach." Seen as feminine reproductive labor, rather than masculine productive labor, teaching is undervalued, even at universities, where the quality of one's pedagogy rarely makes or breaks a tenure case (especially at so-called research universities). To reclaim the

didactic is, therefore, a feminist project because it insists that teaching is not only valuable, but that it requires extraordinary skill, savvy, complexity, and especially style.

I would, therefore, like to propose a revised definition of didactic literature: writing that *by virtue of* its aesthetic qualities is able to teach. This definition moves us away from the drudgery of rote learning and opens up the possibility of being moved, influenced, or re-oriented though aesthetic encounters with texts in unexpected ways. Although didactic literature traditionally refers to stories that teach specific lessons in predictable ways, a feminist reimagining of this genre recognizes that the effects of reading are always situated and contextual and cannot be determined in advance. The frustrating and beautiful reality is that teaching is always unpredictable and it is difficult to account for what has been learned and how, especially using institutional metrics such as teaching evaluations or "student learning outcomes." This does not mean that it is futile to wonder about the situated effects of the texts we read and write; on the contrary, this means that questions of learning and teaching require our time, care, and attention, rather than our scorn or our indifference.

To read (and write) feminist science studies as didactic literature is to become curious about what words *do*, how they flow through or *influence* us. Isabelle Stengers (2008) calls the transformative power of writing *efficace* (efficacy), which she likens to witchcraft and other forms of magic.[1] For Stengers, "theories are always efficacious, they always add to the situation, even when they only aim at diagnosing it" (p. 53). Reclaiming the didactic requires a "speculative commitment" (Puig de la Bellacasa, 2010) to asking what a text might add to the situation. This involves a different set of reading practices oriented around teaching and learning. When we read a given text in this way, we sometimes find the most efficacious passages, the most seductive passages, the most tentacular passages (Hayward, 2012) are those that "seek not to explain but *involve*" (Halberstam, 2011, p. 15, emphasis mine); passages that are speculative, allegorical, poetic, or farfetched; passages that we, as teachers, cannot help but read aloud in the classroom or that we, as writers, cannot help but cite again, and again.

Going back into familiar texts with this set of reading practices, we are reminded that their didactic force is not always located in the explanation, information, or diagnosis it offers but in how language gets under the skin, offering new structures of feeling and perception.

For example, Langdon Winner's (1980) famous story about Robert Moses's low bridges that kept buses from bringing low-income people of color to Jones Beach is the most efficacious example in his classic article "Do Artefacts Have Politics?"; however, it seems that it is also apocryphal. In 1999 an exchange between Bernward Joerges and Steve Woolgar & Geoff Cooper brings to light the fact that the low bridges on the Long Island Expressway did not prevent people of color from going to Jones Beach and, indeed, do not currently prevent buses from traveling on the expressway (Joerges, 1999a, 1999b; Woolgar & Cooper, 1999). Given the fact that this is now common knowledge, what should we make of the fact that "Do Artefacts Have Politics?" continues to be taught in introductory science and technology studies (STS) classes (including my own)? If its most compelling passage is a fabrication, what does this article have to offer? In their response to Joerges, Woolgar & Cooper draw our attention to the didactic force of Winner's bridges: "the power and significance of the story lies not in its referential adequacy but *elsewhere*—that is, in its rhetorical strategies and its pragmatic value within the field of S&TS argumentation" (1999, p. 442, emphasis mine). The value of Winner's exemplar, it seems, is not as a factual account of US history (because it isn't), but how it models a way of paying attention to technology, infrastructure, architecture, and public space that is central to STS analysis. Against the common perception of technologies as neutral or progressive, Winner teaches his readers to consider the exclusions and inclusions (intentional and unintentional) in our built environments, and how material things uphold, resist, or intensify configurations of power and authority. In this almost forty-year-old article with somewhat musty academic language and a handful of now-arcane Cold War military acronyms, my students reliably and enthusiastically grab ahold of Winner's racist bridges because he introduces them into *a new way of seeing*.

In this way we might read articles like "Do Artefacts Have Politics?" as *fables of attention* (Kenney, 2013), texts that teach us to pay attention to our world in new ways. These fables initiate us into unfamiliar "arts of noticing" (Tsing, 2015), draw us into alternate "economies of attention" (Daston, 2004). The fable is a classic genre of didactic literature, teaching moral lessons through short, well-crafted stories. The skill of popular fabulists like Aesop and Jean de la Fontaine lies in their ability to address, to charm, to teach, and to gather, century after century. However, despite its remarkable longevity, the fable does not immediately strike us as an appropriate genre for academic writing. Talking animals and moral lessons seem opposed to the kind of "serious, adult thinking" (Stengers, 2008) that counts as scholarly. It feels risky to embrace a genre that could undermine rather than strengthen one's intellectual authority. It seems childish to make up stories to entertain, not just inform. And besides, doesn't fabulist also mean liar?

To think of feminist science studies as, among other things, didactic literature means that we will have to learn to live with these anxieties. This is difficult in the humanities and social sciences, as we often have to defend the legitimacy of our research in the face of the epistemological dominance of the STEM fields. However, if we want to do scholarship that will *influence* our readers, I argue that we must risk the terrible schoolmarm femininity of the didactic and the childishness of the fable, dare to embrace the fickle magic of language and ask: what do our stories teach?[2]

Fables of Response-ability

The fable genre, first and foremost, teaches its readers how to be responsible. For example, in Jean de la Fontaine's "The Cicada and the Ant," the cicada sings all summer long, neglecting to store up food for the winter; when she asks the ant to share some of hers, the cicada is rebuked. This story is addressed to its reader; it teaches us to plan for the winter ahead because our neighbor might fail to respond with generosity, and in so doing it "renders me responsible" (Keenan, 1997, p. 58). In *Fables of*

Responsibility: Aberrations and Predicaments Ethics and Politics, Thomas Keenan highlights the role of this moral address in defining what kinds of stories fables are and how they work on their readers: "What is at stake in the fable is, more than anything else, the interpretation and practice of responsibility—our exposure to calls, others, and the names with which we are constituted and which put us into question" (p. 45).

Like the "Cicada and the Ant," Winner's story about Robert Moses's bridges is a moral tale addressed to his reader. His argument isn't just that artifacts have politics, but that we ought to take collective responsibility for technological change. Technological innovation, according to Winner, requires as much scrutiny as "changes justified on political grounds" (1980, p. 135). If we don't scrutinize new technologies, they become part of the fabric of everyday life and it becomes increasingly difficult to contest their ubiquity; those who do will be "dismissed as dreamers or fools" (p. 134). To illustrate the dangers of adopting new technology without democratic debate, Winner uses the example of the mechanical tomato harvester introduced in the 1940s, one of the many technologies that ushered in the era of industrial agriculture. As a direct result of the mechanical tomato harvester, farm laborers lost their jobs, wealth became more concentrated among very large growers, and tomatoes were increasingly bred to be handled by machines—with thicker skins and less flavor (p. 126). Like La Fontaine, Winner details the consequence of inaction: the cicada will go hungry and we will eat tomatoes that are less than tasty. In doing so, he addresses his reader, implicates us, and insists that we pay attention to the politics of new technologies; he renders us responsible.

The way I see it, the key difference between feminist science studies and the broader field of STS is that writing in feminist science studies always implies this moral address.[3] For feminist science studies scholars, the histories of science, technology, and medicine are inextricable from the histories of colonialism, imperialism, and warfare; scientific knowledge is part of the fabric that constitutes and transforms consequential categories like sex, gender, race, dis/ability, and sexuality. The purpose of this scholarship is not only to chronicle the historical relationships between

technoscience, power, and privilege, but in doing so, to show that these developments are socially and historically contingent, not the result of inevitable scientific progress. As S. Leigh Star (1991) reminds us, "it might have been otherwise" (p. 53). It could still be otherwise. And, knowing this deep in our marrow, it becomes our collective responsibility to create and sustain more livable technoscientific worlds.

Or perhaps *responsibility* is too heavy-handed, too serious, too adult a name for what feminist fables teach. Maybe feminist fables aren't so much about imparting duty or moral obligation as they are about *cultivating the capacity for response*. Recent works in feminist science studies have proposed *response-ability* as a term that might whet our imaginations for more relational ethics and politics enacted in everyday practices of living in our more-than-human world (Haraway, 2008, 2012; Myers, 2006; Schrader, 2010; Hayward, 2010; Barad, 2012; Hustak & Myers, 2012; Reardon, 2013; Reardon et al., 2015). The feminist ethic of response-ability focuses not on *being responsible* but on learning how to respond and "opening up possibilities for different kinds of responses" (Schrader, 2010, p. 299). Donna Haraway (2008) writes about response-ability working on agility training with her Australian Shepherd, Cayenne Pepper; Astrid Schrader (2010) describes how scientists succeed and fail at responding to *pfiesteria piscicida* in toxic algae bloom research; Reardon et al. (2015) discuss how cross-disciplinary pedagogical initiatives can foster more response-able research. In each of these examples, what counts as response-ability is not known in advance; it emerges within a particular context and among sometimes unlikely partners, who learn how affect and to become affected by one another (Despret, 2016). Thus, response-ability captures the spirit of Thomas Keenan's "exposure to calls," but also recognizes that not only humans call and not only humans respond. How we pay attention affects whether we can hear these calls and how we learn to respond (Despret, 2016). In this way, fables of attention are also fables of response-ability (see also Kenney, 2015).

Haraway insists that response-ability is not only cultivated in labs, on agility training courses, or in other multi-species encounters, but also in the

way we tell stories about these (and other) phenomena. In Haraway's recent work she foregrounds how the desire to cultivate response-ability guides her own approach to writing. For example, in her article "Awash in Urine," Haraway narrates personal and political histories of Diethylstilbestrol (DES) and Premarin connecting disparate actors across geographic and historical contexts. For Premarin, an estrogen medication made from the urine of pregnant mares, Haraway's history brings together:

> fetal calves stripped of amniotic fluid, urinating pregnant Canadian women, pregnant mares and their foals and consorts in Manitoba and beyond, activists in horse rescue and women's health, economically strapped contract farmers, a California menopausal woman worried about familial heart disease in the company of a lucrative market-ready crowd of other menopausal Americans, and German zebras in zoos in the 1930s. (2012, p. 312)

She describes this storytelling practice as "conjugating" or "yoking," joining together what had otherwise been apart. Bringing these surprising actors together, Haraway tells stories where neither bodies nor chemicals like Premarin are entities unto themselves but are made in and through these relations: "'our bodies, ourselves,' includes mares and their foals (and a few stallions)" (p. 307). Since these kinds of relational stories have become so common in feminist science studies (due in large part to Haraway's influence), it can be difficult to remember that this is a deliberate *narrative style,* chosen for its aesthetic and political effects. Haraway writes: "Why tell stories like this, when there are only more and more openings and no bottom lines? Because there are quite definite response-abilities that are strengthened in such stories" (p. 312). Here, she draws attention to the didactic quality of feminist storytelling, specifically, how it can enable and shut down our capacities to attend and therefore also to respond "within and as part of the world" (Barad, 2007, p. 37).

If we understand feminist science studies scholars as fabulists committed to crafting response-able stories, we need to pay attention not only to what our stories say, but what our stories *do* as they move through social worlds (Frank, 2010). This approach draws us toward questions of

efficace (Stengers, 2008): Does this story enroll? How does it sensitize us to the world? What modes of attention does it teach? Who does it gather together? What response-abilities are strengthened? Which are eroded?

To illustrate what this proposal might look like, I read recent writing in feminist science studies as fables of response-ability, amplifying their didactic registers and paying attention to moments that are more speculative, poetic, and personal, moments where they loosen their grip on reality and take us *somewhere else*. In what follows, I will read work by Natasha Myers, Mel Chen, Eva Hayward, and their collaborators not only as explanatory but as *involutationary* (Hustak & Myers, 2012)—stories that involve their readers, sensitizing our bodies, imaginations, and sensoria to more-than-human worlds. Like Haraway, these authors tell relational stories about chemical ecologies, where species, bodies, and environments shape one another through absorption, ingestion, respiration, and sensation. These articles offer important insights about how we are constituted in and through "chemical kinships" (Murphy, 2016). However, to read them only on the level of their ontological claims (i.e., that the world is relational) would miss how they teach us to pay attention to the calls of others and render us response-able. By reading these authors together, I hope to both acknowledge the didactic work that feminist science studies texts are already doing and encourage others to experiment with telling their own fables of response-ability.

Chemical Ecologies

Recent literature in feminist science studies is rich with stories about how we are constituted by and in relation to (sometimes toxic) chemicals (e.g., Murphy, 2008; Hayward, 2010; Chen, 2011; Haraway, 2012; Hustak & Myers, 2012; Murphy 2013; Agard-Jones, 2014; Davis, 2015; Shotwell, 2016). Drawing on the environmental justice movement, disability studies, queer theory, and Indigenous studies, this literature offers narrative resources that help us account for uneven geographies of exposure that enable certain forms of life and disable others (Murphy, 2016). For example,

we see how US and US-backed military operations have lasting chemical legacies that continue long after the wars are over; Agent Orange in the Vietnam War (Gammeltoft, 2014), depleted uranium in the Gulf War (Nixon, 2011), and glyphosate (Roundup) in the US–Colombia War on Drugs (Lyons, 2016)—none of which are officially considered "chemical weapons"—have transgenerationally altered human and non-human life in Vietnam, Iraq, Kuwait, Colombia, and elsewhere. This literature models how to pay attention simultaneously to the spatial, temporal, material, and political dimensions of living in a "permanently polluted world" (Liboiron, 2016, p. 104). As Michelle Murphy (2008) explains, "Molecular relations…not only move spatially across the earth on currents and winds, and not only spread transnationally through the proliferation and redistribution of industrial processes in global capital, but also are part of transnational conjunctures of militarism, activism, research, citizenship, and dispossession" (p. 701).

Accounting for the ways of living and dying made possible by pharmaceuticals, petrochemicals, plastics, and pesticides is necessary political work. Yet, despite the fact that our relations with these chemicals are ubiquitous, banal, and everyday, we can easily become desensitized to their effects on our own bodies and the bodies of others who are differently located in cycles of production, consumption, and waste. As we participate in consumer capitalism, it is difficult to attend to the many ways in which we are implicated and imbricated in ongoing chemical violence, both spectacular and everyday, especially violence that seems "far away."[4] As Heather Swanson (2017) writes in "The Banality of the Anthropocene":

> We are all entangled with the everyday violences of industrial agriculture and [other] nationalist projects in a way that…shopping at Whole Foods won't solve…How is it that Americans, especially white middle-class ones, learn not to notice such entanglements, to not be affected? How do we learn not to see the damage around us?

Disaffection, it seems, is central to the perpetuation of business-as-usual in late industrialism (Fortun, 2012). In this context, feminist literature on chemical ecologies is didactic; by teaching their readers to become affected

by relations we have learned to ignore, these authors "makes relations sensible" (Murphy, 2016) and create occasions for different kinds of response. As Liboiron, Tironi, and Calvillo (2018) argue: "A permanently polluted world is one that, because of its deep alteration, reclaims the need to incite new forms of response-ability" (p. 332).

Although "fables of response-ability" is intended as a capacious category that can encompass diverse matters of care in feminist science studies, the literature on chemical ecologies illustrates why it is vital to attend to the *affective force* of our writing. Evidence of environmental injustice is available at our fingertips; but evidence alone is not enough to transform the structures of feeling and perception that authorize environmental violence. It is important not only to *know*, but also to *feel* how boundaries between people and their ecologies are "permeable, silted, breathing, and relational" (Voyles, 2015, p. 218). Fables of response-ability, therefore, might not always be true stories, but useful fictions that open up possibilities for inhabiting ecologies otherwise. Since living well in an unjust world requires a range of complex and contradictory feelings, it is crucial that these stories not only focus on damage, illness, and violence (Tuck, 2009), but also the kinds of pleasures and possibilities of chemical kinship. To illustrate how attention to chemical ecologies can also encourage joyful curiosity, I turn first to Carla Hustak and Natasha Myers's (2012) "Involutionary Momentum: Affective Ecologies and the Sciences of Plant/Insect Encounters"—an article that offers poetic and theoretically rich descriptions of the chemical chatter between plants and insects. By telling stories that take the lives of plants seriously, Hustak and Myers sensitize us to the pull of forces we have been taught to ignore, and open the question of ecological response-ability.

Involutionary Momentum: Darwin's Body Experiments

Hustak and Myers's article "Involutionary Momentum" offers a feminist account of the relations among insects, plants, and the people who study them. The article engages with findings in chemical ecology, a field that "is

devoted to promoting an ecological understanding of the origin, function, and significance of natural chemicals that mediate interactions within and between organisms" (Journal of Chemical Ecology, n.d.). While on the one hand, the work of chemical ecologists teaches us about the fascinating chemical communication between species via pheromones and other chemical signals, they often employ neo-Darwinian language that emphasizes individualism, competition, and efficiency to the exclusion of all other ways of understanding these relations. The encounters between *Ophrys* orchids and male bees, for example, are narrated as trickery and "sexual deception" (p. 75) because *Ophrys* mimics the sex pheromones of their insect pollinators, luring them to participate in their pollination without offering nectar as a "reward." These metaphors not only naturalize neoliberal, capitalist, and military values, but, as Hustak and Myers demonstrate, they constrict our collective imaginations and shut down our ability to recognize and respond to agencies other than our own. Neo-Darwinian accounts give us mechanistic "ecologies, populated by blind, reactive automatons" (p. 79). In "stultify[ing] both orchid and insect agency" (p. 79), the standard narratives are not able to "admit pleasure, play, or improvisation within or among species" (p. 77).

Hustak and Myers devote relatively little space to critiquing dominant accounts; instead, they begin to spin a different set of tales. In their article, they counter neo-Darwinian storytelling with involutionary storytelling, offering vivid accounts of how organisms become involved with one another's lives. Their descriptions of orchid and insect encounters are sensuous, sensual, and, depending on your interspecies proclivities, downright sexy. These are seductive narratives where "mimetic relations among plants and animals take shape in the thickness of the space between bodies, where affects and sensations are *transduced* through *excitable tissues*" (p. 78). We learn about how the specialized anatomy and volatile chemicals released by the *Ophrys* orchids "entice male bees to 'indulge' in the pleasures of pseudocopulation" (p. 78) and how tobacco plants "synthesize and release a concentrated plume of volatile chemicals" to attract carnivorous insects to sup on the tobacco's herbivorous predators

(p. 99). Hustak and Myers's writing style goes beyond thick description; they weave a poetics of encounter that invites the reader to indulge her imagination in these remarkable scenes of ingestion and pollination.

These interspecies encounters are taken from the field of chemical ecology (as well as Charles Darwin's writing on orchids), but do not mirror their stories back—they are positioned "athwart" (p. 77). Hustak and Myers read chemical ecologists *as if* they were involutionists (p. 101), grabbing ahold of radical claims of plant communication, savoring the most savory speculations (e.g., talking trees!) before they are retracted by their authors in favor of more conservative narratives (e.g., trees that "eavesdrop" to enhance their own fitness). They skip over the functionalism in Darwin to identify and amplify more muted stories of "affinities, attractions, and intimacies" (p. 79). They glean suggestive phrases from biological texts and *involve* them in other stories—stories of affective ecologies, intimate encounters, and articulate orchids. Here they use Darwin's own words to sensuously describe his scientific practice:

> [Darwin] took special note of each species' labellum, that special petal that extends out of the flower like a platform and "affords" both an "excellent landing-space" (98) and a "good standing place" (57) for the insect. In one species, he showed how its "two prominent ridges, sloping down the middle" acted as a "guide" to lure the insect towards the nectary. The insect's "flexible body" would allow it to reach the nectary and contact the pollinia (25)…He wanted to understand how the labellum "induced" an insect "to alight" (77). To do so, he noted the pleasures of taste that might attract the insect. In one case he noted, the labellum secreted enticing drops of nectar at a distance from "the true nectary" (77). (p. 86)

Here, Hustak and Myers practice a kind of involutionary poaching, hunting for precious empirical details from the game preserves of respectable scientific history (de Certeau, 1984). They invite us to share in the secreted bounty, beckoning their readers with meaty Latinate words like "pullulate" and "loquacious" (p. 79).

While all of these stories are didactic and open up different ways to understand orchids, insects, and scientific practice, I want to draw attention to one specific moment in the article where the authors move more fully into the genre historical fiction, igniting new imaginings for what it could mean to do evolutionary biology. Hustak and Myers's telling of Darwin's intimate encounters with orchids offers a useful reminder not to overlook the affective force of speculative, poetic, or fictional stories as we learn to attend and respond within our more-than-human world. To be sure, these vignettes are, in part, grounded in Darwin's own papers. Darwin documented many of the curious methods by which he studied orchids, for example, probing the flowers to discover what kind of stimulation would persuade each species to eject its pollenium (pp. 86-90). Alongside lush retellings of these practices, Hustak and Myers engage in a kind of speculative ethnography, imagining how Darwin involved *his own body* in his experiments. They discuss a passage where he translates the position of Catasetum antennae to human anatomy, describing the differences between species by invoking a man holding his arms at different angles. Hustak and Myers read this not as an anthropocentric metaphor, but as possible evidence that Darwin was conducting "body experiments" (p. 93), bending his arms into the shape of the Catasetum antennae. This reading is animated by Myers's anthropological work, which details the experiments performed by protein crystallographers when they move their bodies into the shape of proteins (2006; 2015) and PhD scientists who dance their dissertations (2012).

Reading this moment as a "speculative fabulation"—a fable—rather than as realist history of science helps us pay closer attention to how this article teaches (Haraway, 2016). Even if Darwin never performed these kinds of body experiments, this story is didactic.[5] It teaches us to pay attention to the bodies of scientists and how they become animated by their curiosity. Here Hustak and Myers open up a space of possibility within a history we thought we already knew, offering a vision of biology as the pursuit of passionate, embodied inquiry. The purpose of telling this story is not to advocate that we reproduce Darwin's experiments with orchids—his practices, they point out, were often as violent as they were tender—but to

show that there are other ways of knowing than the disembodied and disinterested version of scientific objectivity that we see in more official histories of evolutionary biology.

In Myers's (2017) most recent project, Becoming Sensor, she takes up her own provocation, developing new forms of passionate, embodied inquiry. In Becoming Sensor, Myers seeks to cultivate feminist, queer, decolonial modes of attention to the ecologies within the ancient oak savannah in Toronto's High Park. In the oak savannah, she "experiment[s] with sensory practices that can document the growth, decay, combustion and decomposition that are essential to the life of this remarkable land" ("Becoming Sensor," n.d.). Myers and her collaborators attune their bodies and instruments to the land, producing sound, images, movements, and knowledge different from those of the restoration ecologists with whom they share the park. Whereas restoration ecologists control invasive species, prescribe burns, and manage wildlife, Natasha Myers and Ayelen Liberona—both trained dancers—take long-exposure photographs while they move their bodies in response to the plant life: "It is by hitching a ride on the growth movements of trees and plants, letting their slow movements lure our bodies, that our kinesthetic images blur the distinction between animator and animated. Letting the wild arc lines of tree limbs set our bodies and cameras in motion, we experiment with ways to intra-animate with the trees" (Myers, 2017). They imagine Becoming Sensor, speculatively, as a hundred-year project—because it is not clear in advance what it will take to undo ecological thinking and doing that is "indebted to capitalist and colonial logics" and find new ways to inhabit the oak savannah ("Becoming Sensor," n.d.). This is a risky project, I think, because it takes seriously the sentience of landscapes and approaches epistemological/political questions with humility; the question "how to relate?" is "insistent but not easily answerable" (Atkinson-Graham, Kenney, Ladd, Murray, & Simmonds, 2015). In this context, imagining Darwin, alone in his study, bending his arms into the shapes he learned from a flower, might give a certain kind of permission to sustain uncertain inquiry, even if it is ultimately historical fiction.

And this, to me, is the moral of the story—that we need to take epistemological and narrative risks if we want to interrupt the neo-Darwinian status quo in evolutionary biology. Why does it seem so natural to have militarized orchids, but so absurd to suggest, as Joan Roughgarden (2009) does, that friendships might be important for the evolution of some animal species? If we cannot imagine life outside of the "calculating, functionalist logic" (Hustak & Myers, 2012, p. 76) of neo-Darwinism, it is impossible to feel or to know the biological world any differently. By telling stories of affective ecologies "shaped by pleasure, play, and experimental propositions" (p. 78), Hustak and Myers activate new questions about the beings and doings of plants and insects. And with these questions comes the matter of response-ability:

> What is at stake in this involutionary approach is a theory of ecological relationality that takes seriously organisms' practices, their inventions, and experiments crafting interspecies lives and worlds. This is an ecology inspired by a feminist ethic of "response-ability" in which questions of species difference are always conjugated with attentions to affect, entanglement, and rupture; an affective ecology in which creativity and curiosity characterize the experimental forms of life of all kinds of practitioners, not only the humans. And it is this mode of ecological thinking that we believe we will need in order to do more effective work in challenging the status quo of ecological irresponsibility. (p. 106)

Although Hustak and Myers do not explicitly invoke anthropogenic environmental destruction in this article, it is unmistakably the context out of which they are writing. However, rather than focusing on damage caused by disaffection, the stories they tell are explicitly crafted to move their readers to attend to our shared world differently. Hustak and Myers ask us to take the most radical claim of chemical ecology seriously—"the air hangs heavy with significance" (p. 105)—and ask how we can further attune our senses, our bodies, and our instruments to the ways that "plants articulate their experience and desires in an aromatic *atmospherics* of volatile chemicals" (p. 100). Even, and especially, in an historical moment of

accelerating environmental violence, Hustak and Myers show the importance of "crafting our stories with attentive, wondering care" (Bynum, 1997, p. 25).

Toxic Animacies: Mel Chen's Couch

In their article "Toxic Animacies, Inanimate Affections," Mel Chen (2011) teaches us how to attend to and respond within twenty-first-century chemical ecologies that enable and disable unevenly. Chen is interested in toxicity both as figure and as lived experience. Living with the ongoing legacies of industrialism, we risk ingesting, inhaling, and absorbing toxic substances and becoming with chemicals that do not promote uncomplicated survival. However, Chen challenges us to restrain knee-jerk panic about toxic exposure and learn to dwell inside the toxic relations of late industrialism. In this article, they develop toxicity into a figure of queer relationality and tell stories of the intersubjectivies and interobjectivies enabled through toxic bonds.

Chen begins by analyzing media coverage of the 2007 US panic about lead paint in children's toys imported from China. Chen is interested in the two principle figures in the news stories: "the vulnerable child, most frequently a young, white, middle class boy, and a dangerous painted toy, Thomas the Tank Engine" (p. 268). These media representations, Chen argues, rely heavily on the discourses of the War on Terror. They present secure boarders as the automatic response to biological vulnerability. Consumer safety is figured as a matter of "homeland security." The invasive toxic threat is not only racialized as "Chinese," but also evinces a nasty strain of US exceptionalism. The problem is not that lead paint exists, but that it has invaded *our* territory and put *us* at risk: "These environmental toxins were supposed to be 'there,' but were found 'here'" (p. 267). "We" (interpellated by the news stories as the parents of the threatened child) are entitled to be free of the toxic consequences of global industrialization, especially in the safety of our own homes. The risk of the lead paint to the

Chinese workers making the toys falls outside the political frame altogether; transnational environmental justice questions are foreclosed.

Similar to Hustak and Myers, though, "Toxic Animacies" does not continue in the genre of critique. Instead of focusing on xenophobic anxiety around national borders, Chen homes in on the queer love story between the little boy and his toy train. Chen notices that this scene of danger—boy with train in mouth—is conspicuously absent from the media representations. The locus of toxic permeability is displaced onto the national border in the form of demands for "quality control" of imported products; to show the boy licking the phallic train is simply "too much" (p. 271), a site of contamination too emotionally, politically, and sexually charged to represent directly. Chen argues that this displacement gives rise to the fantasy of absolute impermeability, as if a more secure boarder could prevent the act of "queer licking" (p. 271) itself: "It is not only a fantasy that not-licking is a viable way to contain heterosexuality within its bounds, but it is also a fantasy that not-licking is a viable way to contain the interconstitution of people and other people, or people and other objects" (p. 275). When we contain toxic threats within the discourses of homeland security, we miss how bodies are constituted with toxins within the specific histories and geographies of transnational industrialization. Instead, we pour economical and emotional resources into creating zones of exception, further protecting already protected life (p. 272) and refusing responsibility for exposures that fall outside of our protection.

When I teach "Toxic Animacies," this discussion of queer licking is one of the two places in the text that students immediately want to discuss. They are simultaneously titillated and horrified by the suggestion that a boy with Thomas the Tank Engine in his mouth constitutes a *queer threat* to norms of sexuality and healthy embodiment. The admixture of queerness, toxicity, and the sexuality of children makes everyone squirm; it is difficult to know how to respond. Surely we do not *actually* want to encourage queer love between little boys and poisonous toys? This discomfort, I suggest to my students, might be the point. What I think this story teaches is a particular habit of critical thinking, the habit of generating narratives that run

counter to dominant stories to get us unstuck from the morass of conventional thinking and *to see where they take us*. Not all counter-narratives will generate new forms of response-ability. However, as Hustak and Myers demonstrate, it is incredibly difficult to think outside of neoliberal, capitalist, and military logics; therefore, in our writing and in our classrooms we must cultivate the art of hitching a ride on a counter-narrative, even, and perhaps, especially at the risk of feeling foolish. *What if* we begin with what is disavowed in the xenophobic media accounts of lead poisoning and performed a *queer reading* of the phobic scene: the potentially toxic encounter between a child and his painted toy. I encourage my students to sit with their discomfort and take seriously Chen's argument about the unavoidable interconstitution of bodies and chemicals; however, I do also find that this story of queer licking is ultimately a dead end. Although it helps us move away from the fantasy of impermeability, it doesn't offer a way to *respond* to the problem differently.

This is why, I believe, Chen switches narrative track, introducing stories of their personal experiences with the "peculiar intimacies and alienations" (p. 265) of multiple chemical sensitivity induced by chronic mercury poisoning. In the second half of the article, Chen describes the everyday practices of wearing breathing masks in public places and the pain, overstimulation, and exhaustion of toxic attacks brought on by inhaling the wrong chemical (perfumes, gasoline, cleaning agents, cigarette smoke). The story of one of these periods of toxic exhaustion is the second place in the text that students gravitate towards. Specifically, the moment when Chen describes how they remembered being embraced by their lover, when in fact it was the couch's embrace that had comforted them (p. 277). Chen narrates this misrecognition not as a failure, but instead asks after the "inanimate affections" that transpired between their injured body and the supple form of the couch. Chen describes this relationship as one of "interobjectivity" since it "is made possible only to the degree that I am not in possession of human sociality" (p. 280).

Chen's first-person accounts of living with multiple chemical sensitivity opens up different political and affective responses to living in a

toxic world. Against fantasies of impermeability and their attendant bio-securitization regimes, Chen draws our attention to the fact that many already experience the disabling effects of capitalist cycles of production, consumption, and waste. And, as Chen argues, these experiences are not only negative; it is also important to take seriously "the desires, the loves, the rehabilitations, the affections…that toxic conditions induce" (p. 281). Telling these personal stories about the queer relationality of multiple chemical sensitivity in an academic article, Chen performs an autobiographical vulnerability that—even in the genre of queer theory, which recognizes the political value of the personal and intimate—nevertheless risks embarrassment, impropriety, and illegibility. It risks illegibility precisely in the places where the story matters most; each time I read "Toxic Animacies," I find myself struggling to grasp the significance of this encounter between Chen and the couch. This, perhaps, should not be surprising, since, as Elizabeth Povinelli (2016) points out, the distinction between life and nonlife is central to Western thought. It is, therefore, likely that we will fail to connect with a story that attempts to push against the opposition between the animate and the inanimate that structures conventional storytelling. But by coming back to this encounter twice in the article (pp. 277-278, pp. 280-281) and again in the final paragraph of *Animacies* (2012, p. 237), Chen challenges their reader to pay close attention to the story despite (or even because of) its ambiguity. Although Chen has "no ready answers" (p. 281) about what lesson we ought to take away, this leaves the reader with the challenge of *how to respond*. It renders me response-able.

Like Hustak and Myers, Chen shows us that "the air hangs heavy with significance" (Hustak & Myers, 2012, p. 105), carrying molecules that can trigger toxic reactions in their encounters with sensitive tissues. And although what we breathe in may harm us, the question should not be how to secure our borders, but "which bodies can bear the fiction of independence and of uninterruptability" (Chen, 2011, p. 274) and which cannot. "Toxic Animacies" gives us different stories, different channels, different registers to orient ourselves around the challenge of how to "think

more broadly about synthesis and symbiosis, including toxic vapors, interspersals, intrinsic mixings, and alterations, favoring inter-absorption over corporeal exceptionalism" (p. 272). These are pragmatic questions that require action (e.g., industrial regulation), but also the ability to sit with and think from experiences of susceptibility, porousness, receptivity, and vulnerability (2012, p. 237). And rather than carve out zones of exception like in the anxious media accounts, learn to tell stories that strengthen care, resilience, and repair within our sometimes toxic chemical ecologies. Telling stories about toxic bonds allows us to map geopolitical and environmental interconnectedness and disparity, helping us to see harm but also the relations made possible in contaminated places. The point here is not to celebrate relationality and chemical agency as such (we see how deadly these can be), but to better account for the ways that we become with damaged environments and "blasted landscapes" (Tsing, 2015, p. 282).

Carnal Light: Ragoût Alba à la Provençale

Fables of response-ability, as we have seen, are often born out of anger at the casual violence of dominant narratives. Eva Hayward's (2011) article, "When Fish and Frogs Change Gender," like Chen's, takes hyperbolic media panic as its starting point. Hayward is troubled by the proliferation of articles with sensationalistic headlines that link pollution with the changes in the sex organs of animals, such as "Female Fish Develop 'Testes' in Gulf Dead Zone" and "Sex-Changing Chemicals Found in Potomac River" (see also Kier, 2010; Di Chiro, 2010; Murphy, 2013; Ah-King & Hayward, 2014; Shotwell, 2016). In these articles, Hayward finds pervasive anxiety about contaminated categories in the place of a real ability to grapple with the changing chemical ecologies of our industrial waterways. Like Chen, she is looking for strategies to account for uneven vulnerability without recourse to purity discourses:

> I wonder how we can address the impacts of toxic substances on vulnerable people and animals without appealing to society's basest fears about sexual disruption. Can we foster environmental

> responsibility without invoking anxiety that our most intimate reproductive environments have been infiltrated by an industrial world? (2011)

Hayward sets out on a project of narrative remediation, to re-story these contaminated landscapes in ways that allow us to respond differently. I use narrative remediation here to name both a desire to remedy harm done by dominant stories and to re-mediate, to stage our "matters of care" differently (Puig de la Bellacasa, 2010). Following Bailey Kier, Hayward (2011) notes that life goes on for the bass in the polluted Potomac: "male bass…produce eggs that can be fertilized by their former gender mates." Chemically induced sex change, then, might be narrated as "an adaptive response" rather than "an alteration of the 'natural order' of things" (2011).

Hayward's work is characterized by an attention to bodies and species as creative responses to their environments (2010, p. 245). "Our bodies," she writes, are "open to the planet" (2011). Therefore, rather than telling lurid stories that traffic in fantasies of corporeal purity and bio-securitization, we must create "concepts of life and embodiment adequate" to the ways in which life—including human life—has already been altered by industrial chemicals (Murphy, 2016, 2017). There are up to eight hundred chemicals used in everyday consumer products that are known or suspected endocrine disruptors (Liboiron, 2016, p. 99); "every human and animal body tested in the past decade contains chemicals that leach from plastics" (p. 89). We, therefore, need to be able to account for the effects of endocrine-disrupting chemicals on human and animal bodies, acknowledging harm without pathologizing those affected. As Alison Kafer (2013) argues: "What is needed then are analyses that recognize and refuse the intertwined exploitation of bodies and environments without demonizing illnesses and disabilities, and especially the ill and disabled bodies that result from such exploitation" (p. 158). Although sex changes, illness, and disability should not be conflated, recent work in queer/trans theory and disability studies highlights the shared importance of critiquing eco-normative discourses (Di Chiro, 2010), reframing those affected by pollution as "queer survivors" (Murphy, 2013) rather than "tragic mistakes

caused by unnatural incursions or disruptions of the natural body and environment" (Kafer, 2013, pp. 157-158). Hayward asks: "Is there a way to re-evaluate ecological resilience—such as the sex-changing response—and meet the future organisms that we are becoming?" (2011). The point is not to romanticize pollution or accept environmental violence, but to ask who we are and who we become in relation to industrial chemicals.

Hayward continues her project of narrative remediation with evolutionary biologist Malin Ah-King in their article "Toxic Sexes: Perverting Pollution and Queering Hormone Disruption" (2014). Drawing on Ah-King and Nylin's (2010) concept of "reactive sex," they discuss how environmental sex change and environmental sex determination are a normal part of the life course for many animals. The peer-reviewed literature is replete with species of fish, amphibians, and reptiles that demonstrate remarkable phenotypic plasticity with respect to sexual morphology and behavior. In crocodiles, for example, embryos with the same genotype can become either male or female hatchlings, depending upon on the temperature during incubation (Ah-King & Nylin, 2010, p. 235). In one species of clownfish, all individuals are born male, but can then develop into females later in life depending upon the social environment (p. 241). Although sex determination in mammals and birds is more stable and more strongly influenced by genes, Ah-King and Hayward (2014) argue that sex in all species is "better understood as a responsive potential, changing over an individual's lifetime, in interaction with environmental factors, as well as over evolutionary time" (p. 6).

Shifting the definition of sex from fixed trait to a potential or capacity for response allows Ah-King and Hayward to provide an alternate accounting of the effects of endocrine disruptors on human and non-human bodies:

> Sex potential is just that, an opening out, responsiveness that is ontologically more dynamic than static. While some organisms have a narrow regular range of sex possibilities—their potential is more delimited—the effects of endocrine disruption provide a reworking of even these limits. In other words, while some species of fish more

> easily shift from female to male as an environmental response to pollution, others, such as polar bears, shift with more trouble. And yet, hormonal disruption assures changes across borders of sexes. (p. 6)

If sex is a potential that responds to environmental stimuli, endocrine disruptors may already be involved with (sexual) development processes in many species—though their effects differ depending upon species and the specificities of exposure. This allows for a different understanding of animals who change sex in response to pollution. Rather than evidencing unnatural incursion, these examples illustrate that sex has always been responsive to environments, which now include toxic chemicals. Told this way, these are no longer scandalous stories, but mundane facts of life in late industrialism. "Neither utopic nor dystopic," they write, "toxic sex opens the realization that bodies are lively and rejoinders to environments and changing ecosystems, even when those same engines of change provide exposure to carcinogens, neurotoxins, asthmagens and mutagens" (pp. 8-9). Although it is important to work to prevent toxic exposure and combat environmental injustice, Hayward insists that we must also be able to account for life already altered and tell stories about the future organisms we are becoming. These stories are not innocent and their politics are not always comfortable; they are risky reworkings of contemporary ecological imaginaries. Especially when I teach these articles, I am cognizant that Hayward's accounts of toxic sex risk romanticizing chemical exposure, risk associating queer and trans people with chemical pollution and animality, risk naturalizing environmental violence, risk replacing genetic determinism with environmental determinism, risks reinforcing the norms that underpin neo-Darwinian concepts of adaptation (see Kenney & Müller, 2017). However, as I have emphasized in my analysis of Myers and Chen, political and epistemic discomfort are a necessary part of learning to tell more response-able stories. The most comfortable stories are those we are already accustomed to hearing; discomfort can clue us into consequential shifts in the narratives that orient us in the world (see also Schrader, 2015).

Hayward teaches us that "human sex is responsive rather than recalcitrant" (Ah-King & Hayward, 2014, p. 7) and that our bodies respond to our environments in spite of fantasies of purity and containment. While her work with Ah-King makes biological claims that should be taken seriously not only by feminists but by evolutionary biologists, Hayward's writing might best be understood as offering imaginative propositions about what it might mean to be embodied. Her wider body of work explores the dynamic relations between bodies and environments in poetic, autobiographical, theoretical registers (2010), through readings of songs (2008), films (2005), artworks (2010), and aquarium exhibitions (2012). These readings work as much through aesthetics as biology, providing different imaginative pathways into questions of response and response-ability, becoming and unbecoming, in an era when life's limits are being profoundly reworked (Cooper, 2008).

To emphasize the more speculative strain in Hayward's thought, I conclude by turning to an article about marvelous becoming and ethical response. In "Carnal Light" (2013), Lindsay Kelley and Eva Hayward do art criticism as speculative fantasy asking what it would be like to *eat* Alba, the subject of Eduardo Kac's infamous bio-artwork *GFP Bunny* (2009). Alba was a white rabbit who was genetically engineered to carry the green fluorescent protein (GFP) gene from a jellyfish, so that she would glow fluorescent green under blue light. Kac had intended to take Alba home as a pet, but she was ultimately unable to leave the laboratory at the Institut national de la recherche agronomique in France where she was born for fear of environmental contamination. Kelley and Hayward found that the Critical Art Ensemble (CAE) had written a recipe for *Ragoût Alba à la Provençale*, inspired by the notion that if Alba could not leave the lab alive to become a pet, she might be able to leave as meat. Kelley and Hayward take the recipe as an occasion to theorize the recombinant sensuality induced by ingesting this unfamiliar protein:

> With CAE's recipe we can imagine that glowing food intensifies vision through tactile registers; the verb "to taste" is conjugated through sight. Glowing at the edges of the mouth, *Ragoût Alba à la*

> *Provençale* cannot be digested without visual recourse. For *homo sapiens* consuming this entree, the mouth is solicited by light, undoing the eye's propriety of vision. Although for Alba this is an unbecoming, a transformation from companion to meal, for the humans involved, vision is reworked by orality…and jellyfish bio-materialities are sent further adrift. (p. 123)

In this article we are invited to join the authors in an involutionary daydream about eating a genetically engineered rabbit. As our bodies adapt to consuming GFP bunnies, they speculate, our tongues might respond by "growing light receptors in our taste buds" (p. 124). If, as Kelley and Hayward contend, "ontology is about what there is and what debts we owe to it" (p. 116), fables of response-ability might give us a way of imagining how to respond to these ontological obligations, which includes questions of how we are already responding and what responsive capacities (real and fantastic) we might yet acquire. Returning to Hayward's work on toxic sex, we see how she composes a world where inter-animacies are not only about corporeal vulnerability but also about resilience and creative response even in the most polluted waters. As Ah-King and Hayward remind us: "Nonhumans and humans are vulnerable, but also exuberant, adaptable, resilient and constantly changing in interaction with environments" (p. 9).

These stories of Darwin's body experiments, Chen's couch, and the bass in the Potomac are fables of response-ability, stories that teach us how to pay attention to the lively agencies around, within, and among us, such that we become more responsive creatures, able to relate within more-than-human ecologies and meet the future organisms that we are becoming. Like Kelley and Hayward's *homo luxivorus*, a being whose tissues and appetites are attuning to her radiant meals, the reader of these fables might also find herself generating new sensitivities, caught up in unfamiliar economies of attention, moving differently through worlds. As Hustak and Myers (2012) put it: "The world is full of 'propositions' waiting to be registered by *interested* bodies. Those who invest their energies in attuning themselves to others can learn over time to discriminate increasingly subtle differences in one

another's utterances" (p. 105). At its best, feminist science studies can sensitize us to the calls of others, through didactic storytelling where narrative and sensorium remake one another. The question becomes: how can we cultivate these kinds of response-able writing practices in the face of prevailing academic conventions that do not always promote artful or efficacious storytelling?

Conclusion: A Fable for Tomorrow

Rachel Carson's (1962/2002) *Silent Spring* famously begins with a fable. She imagines a near future when life in an idyllic American town is slowly poisoned by synthetic pesticides. Humans, farm animals, plants, and wild animals like birds, fish, and bees, all become sick and many die, leaving the previously abundant landscape lifeless and bereft of birdsong. This first chapter of *Silent Spring*, titled "A Fable for Tomorrow," has become iconic in environmental writing, inspiring decades of environmentalists to write their own eco-apocalyptic stories that illustrate the world-destroying power of industrial capitalism. However, it seems that we may learned the wrong lesson from Carson. Teaching *Silent Spring* in 2019, what feels most significant to me isn't its dystopian vision but how, like the authors discussed above, Carson's writing "makes relations sensible." DDT is not a *pesticide*, she argues, because it is impossible to target pests without harming all life; pesticides are really *biocides*. "A Fable for Tomorrow" is a charismatic story, a work of speculative fiction that begins the non-fiction book that is widely credited with ushering in a new environmental consciousness in the United States and, importantly, the creation of the United States Environmental Protection Agency in 1970. *Silent Spring*, from all historical accounts, was powerfully didactic; it made us see our bodies not as citadels, but as porous, vulnerable to toxic chemicals, and always in relation with our environment.

In the twenty-first century, as industrial chemicals accumulate and unevenly participate in specific forms of living and dying, we will need more kinds of stories (not fewer) to teach us how to respond to our changing chemical ecologies. The greatest challenge in teaching transnational

environmental justice, I have found, is to make the relations between consumption in our own lives and environment justice issues "elsewhere" present, palpable, unbearably alive. Beyond the warm glow of "awareness" and sharp sting of guilt, we need to nurture alternative "affective economies" (Ahmed, 2004), where regulating or abolishing corporate emissions, tailings, and other "externalites" *feels* fundamental and urgent—and not only for those whose bodies and lands are directly affected. More than fifty years after *Silent Spring*, Michelle Murphy (2017), alongside others in anthropology and the environmental humanities (e.g., Robin & Rose, 2004; Shapiro & Kirksey, 2017; van Dooren & Rose, 2016), struggles to tell stories that will make relations sensible:

> I am looking for words, protocols, and methods that might honor the inseparability of bodies and land, and at the same time grapple with the expansive chemical relations of settler colonialism that entangle life forms in each other's accumulations, conditions, possibilities, and miseries.

We need to continue asking what kinds of stories, academic or otherwise, can help us account for everyday environmental violence in ways that engender meaningful, collective response in many forms: as policy, as activism, as pedagogy, as care, as knowledge-making, and as the intimate practices of everyday life.

Although feminist science studies has been a field that has consistently challenged dominant technoscientific storytelling (e.g. Hubbard, 1979; Haraway, 1989; Martin, 1991), the conventions of academic writing discourage us from asking which genres, styles, and forms might cultivate the capacity for response. Even Mel Chen expresses reticence at departing from academic conventions by including personal stories in a peer-reviewed article: "As academics are often trained to avoid writing in anything resembling a confessional mode," they write, "such a turn is fraught with ambivalence" (2011, p. 273). However, as I argue above, Chen's accounts of living with multiple chemical sensitivity are some of the most efficacious passages in "Toxic Animacies." My students often express confusion about why a scholar is writing about a particular topic or making

a particular argument; autobiographical writing can be a powerful way to situate your knowledge and draw new readers into your matters of care.

My point is not that we should all write autobiographically. Rather, in order to *influence* our readers (which can include our students), scholars will need to tell stories that defy academic conventions and risk being seen as too personal, too speculative, didactic, or sentimental, too kitschy, too ambiguous, angry, sad, or beautiful, too naïve or unsophisticated, not serious, or "just" poetry. I offer the term *fables of response-ability* not to suggest that everyone drop what they are doing and write fables, but as an incitement to proliferate different kinds of reading and writing in feminist science studies.[6] For example, it gives us license to play with the relational properties of language—its viscosities, conductivities, velocities, to experiment with "the arts of mediation that would incite absorption, attunement, and excitement" (Berlant, 2013), and ask what our stories do, who they enroll, and how they circulate in our communities, our classrooms, and beyond. What counts as a responsible story and what stories enable responsiveness cannot be known in advance; storytelling is a pragmatic art and, therefore, requires us to try different approaches and, as I have argued, risk failure, illegibility, and being thought foolish. Some fables of response-ability will be empirical, others imaginative; some haunting and poetic, others no-nonsense practical; some energetic, full of brilliant paradigm-shifting neologisms, others plain spoken and heartfelt. Different kinds of stories engender different ways of attending, responding, and relating.

When we read feminist science studies scholarship as didactic literature, we understand ourselves not just as researchers but as participant storytellers who influence worlds in mostly mundane, but sometimes extraordinary ways (Kenney, 2015). *Silent Spring*, for example, created the conditions whereby regulating chemicals based on "unreasonable risk of injury to health or the environment" became thinkable in the United States. Most books, obviously, will not have the world-changing power of *Silent Spring*. But, as we have become inured to the never-ending news of oncoming apocalypses, environmental or otherwise,

we will need stories that make us feel again, wake up our senses to our more-than-human-world and teach us how to respond anew. Despite our aversion to didacticism, in a certain sense, teaching is all we have.

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Notes

[1] In this article, I am working with Isabelle Stengers's *efficace*, rather than the more common science and technology studies concept of "performativity." Karen Barad's notion of "posthumanist performativity" was explicitly designed to contest the "excessive power granted to language to determine what is real" (2003, p. 802). In "Experimenting with Refrains," Stengers (2008), on the other hand, uses *efficace* explicitly to call attention to the transformative power of words and theories—their liveliness, their animacy, their magic.

[2] There are, of course, many Indigenous storytelling traditions, where stories simultaneously teach, entertain, impart knowledge, and nourish relations between humans and non-humans (see e.g., Kimmerer, 2013; Simpson, 2014; Nelson, 2017). In conversation with Indigenous scholars working within these traditions, I am interested in contributing to an academic vocabulary that values the arts of storytelling and what stories have to teach us. However, to avoid appropriating Indigenous cultures, I work within the European fable tradition and attempt to breathe some life back into the genre of didactic literature.

[3] Key moral questions at the center of feminist science studies literature include: "whose science, whose knowledge?" (Harding, 1991), "what counts as nature, for whom, and at what cost?" (Haraway, 1997), and "cui bono?" (Star, 1991). Haraway, in particular, emphasizes the non-

innocence of all knowledge-making practices, including those of feminist science studies. In “Situated Knowledges” (1991), she famously asks, “with whose blood were my eyes crafted?” (p. 192), drawing attention to the ways that our technologies and techniques of vision implicate us in systems of power and privilege.

[4] Teaching my Gender, Health, and the Environment class I continue to butt up against the widespread belief that pollution always happens “elsewhere”—be it the Global South, the American South, south of the border, the desert, the far North, or even just across the San Francisco Bay. While it is important to realize that exposure to industrial pollution is unevenly distributed, this kind of thinking can naturalize other places as endemically polluted and thus continuously pollutable (see Voyles, 2015). The pedagogical challenge, then, is to dismantle this ideology by making our relations to environmental problems sensible—from the Bhopal gas disaster (Fortun, 2001; Speigel 2013), to the tar sands (Huseman & Short, 2012), to the maquiladoras at the US–Mexico border (Johnson & Niemeyer, 2008).

[5] Here I depart from Vinciane Despret’s (2013) reading of “Involutionary Momentum.” She argues that Hustak and Myers do not enchant or re-enchant the world; they simply pay attention to evolutionary biology before neo-Darwinian disenchantment. “Animation, [not de-animation]” she explains quoting Latour, “is the essential phenomenon” (p. 36, emphasis mine). Despret goes on to argue, “Hustak and Myers did not have to re-enchant, they just had to carefully follow a scientist who did not de-animate the world he was observing” (p. 36). Here, Despret’s insistence on a historical Darwin moved by an essential animated nature takes our attention away from the creative activities of reading, writing, speculating, and theorizing. I discuss the example of Darwin’s body experiments to foreground how fiction and speculation work alongside historical and biological claims in “Involutionary Momentum.” Although Despret recognizes that Hustak and Myers’s creative storytelling cannot be separated from the Darwin they describe—“I do consider Hustak and Myers’s analysis to be actively part of the agencement [assemblage]” (p. 42n52)—her analysis does not allow for the transformative power of fiction. For Despret, these stories about Darwin are simultaneously historical and constructed. My argument is different—namely, that historical fiction can be an efficacious form of feminist science studies storytelling.

[6] While many of the citations in this article can be classified as “new feminist materialism” or “multispecies ethnography,” I resist naming these

trends here to avoid giving institutional legitimacy to some kinds of academic storytelling at the expense of others. Stories that center "matter" or "non-humans" are not the only kinds of stories that can help us respond within twenty-first-century chemical ecologies. Stories about people or stories about stories, for example, also have transformative power. No one story or one kind of story is ever enough.

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Bio

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