CHAPTER 7

Polluted Politics? Confronting Toxic Discourse, Sex Panic, and Eco-Normativity

GIOVANNA DI CHIRO

> The body as home, but only if it is understood that bodies can be stolen, fed lies and poison, torn away from us. They rise up around me—bodies stolen by hunger, war, breast cancer, AIDS, rape; the daily grind of factory, sweatshop, cannery, sawmill; the lynching rope; the freezing streets; the nursing home and prison. . . . Disabled people cast as supercrips and tragedies; lesbian/gay/bisexual/trans people told over and over again that we are twisted and unnatural; poor people made responsible for their own poverty. Stereotypes and lies lodge in our bodies as surely as bullets. They live and fester there, stealing the body.
>
> —Eli Clare

As genderqueer author Eli Clare notes, there are myriad terrible ways that bodies are stolen, violated, and poisoned. Enumerating the diverse messages of "body hatred" that he has lived with throughout his life owing to the "irrevocable difference" of his queerness and disability—perverse, unnatural, defective, tragic—Clare explains how these expressions of abnormality "sunk beneath his skin" and would tear him from his body (2001, 362). Bodies can be torn and stolen away in multiple ways (rape, murder, poverty, disease, trauma, numbness), and Clare keys into the various and intersecting techniques through which injustice can mark a body:

> I think of the kid tracked into "special education" because of his speech impediment, which is actually a common sign of sexual abuse. I think of the autoimmune diseases, the cancers, the various kinds of chemical sensitivities that flag what it means to live in a world full of toxins. I think of the folks who live with work-related

> disabilities because of exploitative, dangerous work conditions. I think of the people who live downwind of nuclear fallout, the people who die for lack of access to health care, the rape survivors who struggle with post-traumatic stress disorder. (2001, 362–63)

"But just as the body can be stolen, it can also be reclaimed" (363). According to Clare, this means "refiguring the world" into one composed of bodies unique and precious to the earth and all who live on it. The body can be reclaimed and refigured as *home*—that desired place of connectedness, family, and well-being—with full realization that the body/home is sometimes the site of exposure to just the opposite: abuse, hunger, polluted water and air. Clare's analysis of difference and connection as being located in the body/home and his social-environmental politics based on reclaiming and learning from those stolen bodies that have been deemed out of place, against nature, broken and deformed, produces what Catriona Mortimer-Sandilands has termed a *queer ecology* that is "both about seeing beauty in the wounds of the world and taking responsibility to care for the world as it is" (Mortimer-Sandilands 2005, 24).

In environmental studies, the term "ecology"—whose root comes from the Greek *oikos,* meaning an inhabited house or household—describes the web of relationships and interconnections among organisms and their "homes" (their communities and biophysical environments) (Ward and Dubos 1972). Thinking of the body as home/ecology, especially in consideration of those bodies, communities, and environments that have been reviled, neglected, and polluted, provides an apt metaphor and material grounding for constructing an *embodied* ecological politics that articulates the concepts of diversity, interdependence, social justice, and ecological integrity. In recent years, the environmental justice movement has elucidated the ways that poor communities and communities of color have shouldered an unequal burden of the negative externalities of modern, industrial society—their lands, homes, communities, and bodies have been exploited, dumped on, and contaminated with toxic emissions resulting in disproportionate rates of environmental illnesses, reproductive harms, and degraded homelands. In contrast to mainstream environmentalism, which has historically viewed social and ecological issues as separate concerns, environmental justice activists construct a more inclusive vision of human-nature interactions generating an ecopolitics that brings environmentalism *home,* so to speak, and defines the environment as our *communities:* the places where "we live, work, play, and learn."[1] Along with

the more commonly understood view of nature as the living biosphere, activists also embrace inhabited/built places—cities, villages, reservations, agricultural fields, workplaces, and poor and low-income neighborhoods located next to hazardous industrial facilities—as *environments* worthy of recognition and protection (Di Chiro 1996). Moreover, the environmental justice challenge to the dominant (primarily white, middle-class, and male) environmental movement espouses human *diversity* as a shared value and locates its historical lineage in struggles for civil rights and social and economic justice (Bryant and Mohai 1992; Bullard 1994). Can such an ecopolitics committed to inclusivity and diversity—which offers an essential corrective to the environmental movement—also embrace as worthy of recognition and protection the unseen bodies, homes, and environments about which Clare writes?

In this chapter I discuss how the dominant anti-toxics discourse deployed in mainstream environmentalism adopts the potent rhetoric that toxic chemical pollution is responsible for the undermining or perversion of the "natural": natural biologies/ecologies, natural bodies, natural reproductive processes. This contemporary environmental anxiety appeals to cultural fears of exposure to chemical and endocrine-disrupting toxins as troubling and destabilizing the normal/natural gendered body of humans and other animal species, leading to what some have called the "chemical castration" or the "feminization of nature" (Cadbury 1998; Hayes 2002). Particular anxiety has been focused on the perils to humanity of our "swimming in a sea of estrogen" (Raloff 1994b, 56; Sumpter and Jobling 1995, 173), a consequence, according to many environmental scientists, of the rising levels of estrogenic, synthetic chemical compounds emitted into our water, air, and food. This concern about the excesses of estrogenic pollution (what some refer to as "ova-pollution") is commonly articulated in popular scientific media as explaining the pan-species *instability* of maleness and as putting at risk the future existence of *natural* masculinity. Invoking an oft-used environmentalist metaphor, this anti-toxics discourse warns that the rising incidences of male-to-female gender shifts and intersex conditions observed in the "lower" species of animals, such as frogs, fish, and salamanders, represents the newest "canaries in the coalmine" portending an uncertain fate for human maleness and for the future of *normal* sexual reproduction (Roberts 2003). Moreover, this anti-toxics discourse argues that many estrogenic chemical toxins disrupt or prevent normal *prenatal* physiological development and disturb natural reproductive processes, leading to rising cases of infertility and producing disabled, defective, and even monstrous bodies. What are presented

by many environmentalists as critical scientific facts (and quite rightly worthy of alarm) can, however, work to create a "sex panic," resuscitating familiar heterosexist, queerphobic, and eugenics arguments classifying some bodies as being not normal: mistakes, perversions, or burdens. This version of anti-toxics environmentalism, while professing laudable and progressive goals, mobilizes the knowledge/power politics of normalcy and normativity and reinforces what queer and disability theorists have analyzed as a *compulsory* social-environmental order based on a dominant regime of what and who are constructed as normal and natural (Davis 1995; Garland-Thomson 1997; McRuer 2006). Clare's critical melding of queer theory, disability theory, and environmental justice politics illuminates the cultural and ideological work performed by the hegemonic concept of the normal in mainstream environmentalism. Scratch a liberal environmentalist and you might find polluted politics enforcing "eco(hetero)normativity" lurking underneath; disability becomes an environmental problem and lgbtq people become disabled—the unintended consequences of a contaminated and impure environment, unjustly impaired by chemical trespass.

The very *real* issue of the myriad grave consequences (in terms of both mortality and morbidity) of the widespread contamination and worldwide bioaccumulation in bodily tissues of hazardous chemicals known as POPs (persistent organic pollutants)[2] becomes distorted by the alarmist focus on one piece of their toxic story. That selective telling of the story which zeroes in on toxic chemicals' role in disturbing hormonal systems, damaging the reproductive organs, and creating sexual instability and impairment has functioned strategically to appeal to the society's basest fears of an ominous disruption in the normal gender order and ultimately the challenge to heteronormativity. If the resuscitation of old and the generation of *new* eco-normative forms of heterosexism were not enough, the media fixation on gonadal deformities and sexual/gender abnormalities as the most treacherous concern ends up perilously de-emphasizing and, in fact, *naturalizing* and *normalizing* the many other serious health problems associated with POPs, which are on the rise: breast, ovarian, prostate, and testicular cancers, neurological and neurobehavioral problems, immune system breakdown, heart disease, diabetes, and obesity.[3]

In the spirit of unearthing counter discourses to these "polluted politics" and queer(y)ing the liberal stance on environmentalism, I examine several examples of research practices, environmental criticism, and social activism that incorporate an anti-toxics emphasis and profess al-

legiance to ecofeminist and/or environmental justice politics. One of the key principles of ecofeminist and environmental justice perspectives is a commitment to what might be called a normative politics of inclusiveness, diversity, and social justice. Again, how inclusive and diverse are these progressive social movements? What are the toxic residues of unrecognized or unacknowledged polluted politics that continue to reassert the normalized body and the naturalized environment and therefore impede the potential for forging coalition politics that move us toward a more *just,* green, and sustainable future? Can we imagine environmental-feminist coalitions that can forge a critical normative environmental politics (we *all* should live in a clean environment; we *all* should have the right to healthy bodies) that resist appeals to normativity?

New Gender Troubles

> Kermit to Kermette? It's Not Easy Being Green
> —Dr. Frank J. Dinan

In the spring of 2008, a *New York Times* article reported on a study by a Yale University biologist on the alarming numbers of "hermaphrodite" frogs (male frogs with ovaries growing in their testes) observed in upscale suburban neighborhoods in the northeastern United States. The article opened with the following attention-getting sentence: "Just as frogs' mating season arrives, a study by a Yale professor raises a troubling issue. How many frogs will be clear on their role in the annual spring-time ritual?" (Barringer 2008, D2).

Although wildlife, evolutionary, and developmental biologists have since the early 1990s observed changes in the physiological development of several species of birds, reptiles, mammals, and fish, and a global decline in the populations of over 30 percent of the known species of amphibians (Alford and Richards 1999), the representation and circulation of this information has in recent years taken on a new sense of urgency. Headlines in scientific and news media have raised the alarm that evidence of the links between species fitness and ecological decay generated from animal studies is surely telling us that "something is sinister underway in the environment" and that humans may ultimately be affected (Amphibian Decline 2006). While the news of rising incidences of fish tumors, clam and mussel lesions, Beluga whale breast and ovarian cancers, and disappearing amphibians have attracted a following in environmentalist circles, the documentation of gender-bending, homosexual, and emas-

culated frogs, fish, birds, and alligators has caught the attention of the mainstream media and the blogosphere. Kermit the Frog a Transsexual? Intersex Fish? Lesbian Gulls? Hermaphrodite Frogs? "Teeny Weenies" (Dunne 1998)?[4] "Silent Sperm" (Wright 1996)?[5] "Sexual Confusion in the Wild" (Cone 1994)?[6]

In the late 1970s and 1980s, following the EPA's banning of the carcinogenic and persistent organochlorines DDT and PCB, studies were conducted on these chemical toxicants and several other classes of halogenated aromatic pollutants, including the infamous and highly toxic 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD, dioxin) to determine their ongoing and long-term health effects, specifically in relation to breast, uterine, and other cancers (Colborn and Clement 1992; Colborn, Vom Saal, and Soto 1993; Steingraber 1997). In the early 1990s, a bumper crop of publications in toxicology and public health journals heightened concerns about the potential adverse human health effects associated with background environmental exposures to so-called endocrine disruptors, chemicals that disrupt endocrine signaling pathways.[7] The harmful effects of TCDD-Dioxin and related compounds on wildlife and laboratory animals had earlier been established, and researchers set upon new studies hypothesizing that other endocrine-active compounds such as estrogenic chemicals that bind directly to the estrogen receptor (including the organochlorines PCB, DDE, PVC, TCE, and synthetic xenoestrogens in birth control pills) may pose environmental and human health problems. The work of Theo Colborn and her coworkers was some of the first to sound the alarm, presenting evidence of the pervasiveness of environmental contaminant-induced wildlife problems, especially those associated with reproduction and development, and suggested that these animal studies need to be seen as sentinels warning us about an impending human health crisis threatening the "human prospect" (Colborn, Dumanoski, and Myers 1996, 258). According to Colborn and her co-authors, the most disquieting consequences of endocrine-disrupting chemicals may not be their effects on some "individual destinies or the most sensitive amongst us, but a widespread erosion of human potential" (232), which we are already witnessing in the current "breakdown of the family" and "dysfunctional behavior in human society" (186, 238). Warning the problem goes "beyond cancer" (198), they predict that endocrine-disrupting chemicals threaten to transform the normal order of things: "We are confident that ongoing research will confirm that the hormonal experience of the developing embryo at crucial stages of its development has an impact on

adult behavior in humans, affecting the choice of mates, parenting, social behavior, and other significant dimensions of humanity" (238).

The framing of the so-called endocrine disruptor thesis emerged from a "new synthesis" of scientific and biomedical information introduced in 1991 at the Wingspread Conference held in Racine, Wisconsin.[8] This meeting brought together a multidisciplinary group of researchers to assess what they considered to be the growing evidence that exposure to synthetic chemicals was interfering with the hormonal signals in wildlife and humans, altering their normal sexual development. The group of ecologists, anthropologists, endocrinologists, toxicologists, wildlife biologists, immunologists, lawyers, and psychiatrists drafted a consensus statement that was intended to integrate and evaluate the findings from the scholarly literature, to establish a research agenda to address remaining uncertainties, and to propose policy recommendations to protect the public health (Wingspread Statement 1991). The endocrine disruptor thesis would now claim the status of a scientific-environmental theory that "places the idea of *abnormal* or *disruptor* at the center of the theoretical framework. This is not a theory about normal processes, but a theory about the abnormal" (Krimsky 2002, 139, emphases in original). More specifically, it is a theory not of genetic, biological, or moral abnormality/deviance, but of the abnormal as the unintended and potentially deadly consequences of perturbing "natural" developmental and reproductive processes.[9]

Despite the Wingspread Statement's apocalyptic words warning of widespread developmental and reproductive *disruption* being caused by environmental contamination, and the broadcasting in 1993 of the BBC documentary (Cadbury 1993; aired on the Discovery Channel) titled *The Estrogen Effect: Assault on the Male,* the information about chemicals interfering with the hormonal system of humans and animals did not attract a lot of media attention (Myers, Krimsky and Zoeller 2001, 557). The publication of *Our Stolen Future* (Colborn, Dumanoski, and Myers 1996), the first mass-marketed book on the subject, would transform the media environment generating extensive news coverage. With the provocative subtitle "Are we Threatening our Fertility, Intelligence, and Survival?" *Our Stolen Future* garnered passionate media reviews describing it as a "chilling," frightening," "catastrophic" cautionary tale, and catapulted the theory of endocrine disruption into the public eye. While the book chronicles a *host* of harmful effects to humans and wildlife, including carcinogenicity and neurotoxicity—both associated with exposure to several known "hormonally active agents" such as DDT and PCB—"the images

that most appealed to the media involved reproduction and sexuality" (Myers, Krimsky, and Zoeller 2001, 557).

Toxic Assault on the Male or: The Emergence of the Incredible Shrinking Man

Speaking in 1995 to a group of U.S. congressional representatives (predominantly men) at the House Subcommittee on Health and the Environment, University of Florida biologist Louis Guillette reported on the startling statistic issued by Danish endocrinologist Neils Skakkebaek that global human sperm counts had declined by 50 percent. In his concluding statements to the traumatized group of congressmen, Guillette stated: "Every man sitting in this room today is half the man his grandfather was. Are our children going to be half the men we are?" (Twombly 1995, 4). Guillette testified that his research on the decline in alligator populations in Florida's Lake Apopka represented animal studies that were consistent with this evidence of an emergent "syndrome" signaled by "decreased male reproductive capacity" on a worldwide scale (Raloff 1994b; Sharpe and Skakkebaek 1993, 1393). Alligator populations were rapidly declining in several Florida lakes located adjacent to a Superfund site that had in the 1980s been contaminated with hormonally active pesticides, including dicophol and toxaphene. Apparently more shocking than the actual decrease in numbers of these Apopka alligators was the fact that their reproductive failure was probably due to the "tiny members" of the males, which had been observed over several years to be shrinking to one-third to one-half the normal size (Colborn, Dumanoski, and Myers 1996, 151). Guillette and his colleagues also noted that female alligators displayed "abnormalities in their ovaries and follicles," and males were discovered to have testicular problems, but the "teeny weenies" were of most interest to the "parade of journalists" willing to slog through the swampy wetlands to photograph alligator penises (151).

According to the researchers, shrunken penises were partly responsible for the 80–95 percent egg-hatching failure rate in Apopka alligators, resulting in population decline, but so was the out-of-balance hormone ratio of both males and females—female alligators appearing as "superfemales" with twice the estrogen typical of a female and almost no testosterone in the males (Guillette, Gross, Masson, Matter, Percival and Woodward, 1994). Earlier animal studies in birds examining the correlation between exposure to estrogenic compounds such as DDT and its metabolite DDE and the precipitous decline in the 1960s and 1970s of the populations of

western gulls in the Channel Islands and herring gulls in Lake Ontario also demonstrated "skewed sex ratios biased toward females" resulting in the so-called gay gulls or lesbian gulls because female gulls were observed sharing clutches with other females (Colborn, Dumanoski, and Myers 1996; Fry, Toone, Speich, and Peard 1987, 30). Similarly, the female birds presented with "grossly feminized reproductive tracts" and males' gonads had "tissues that were both ovarian and testicular, an intersex or hybrid gonad" (Fry et al. 1987, 31). Avian toxicologists hypothesized that the intersex conditions found in males most likely accounted for their lack of sexual interest in females and therefore explained the "homosexual behavior" in the cohabiting females.

Many other wildlife sentinel species have been studied and have provided evidence of the potential impacts on the health and reproduction of human populations of exposure to the many identified hormonally active/endocrine-disrupting chemicals that contaminate the water, air, soil, and food supply (Fox 2001). In the late 1990s, the National Academy of Sciences (NAS) established committees on (1) Animals as Monitors of Environmental Hazards and (2) Hormonally Active Agents in the Environment and concluded:

> Reported reproductive disorders in wildlife have included morphological abnormalities, eggshell thinning, population declines, impaired viability of offspring, altered hormone concentrations, and changes in sociosexual behavior. . . . Many wildlife studies show associations between reproductive and developmental defects and exposure to environmental contaminants, some of which are HAAs (hormonally active agents). (NAS 1999, 21)

Since the publication of *Our Stolen Future* in 1996, many wildlife biologists, endocrinologists, and toxicologists have argued in support of the use of "wildlife health data in a larger epidemiologic weight-of-evidence context upon which to base decisions and policies regarding the effects of chemical exposures on human populations" (Fox 2001, 859). But the human evidence in support of the endocrine disruptor thesis has been much more controversial, even though many scientists have postulated a link between these hormonally active agents and a number of "human abnormalities," including problems in "male reproductive capacity," breast, testicular, and prostate cancer, and neurological and neurobehavioral effects (Krimsky 2000). As with wildlife studies, the popular media dissemination of the research examining human effects of toxic exposure adopts the "assault-on-the-unstable-male-as-the-most-terrifying-thing-of-all"

premise. Despite the evidence demonstrating links between exposure to endocrine-disrupting toxicants and breast, ovarian, prostate, and testicular cancers, immune system function, metabolic diseases, mutagenic effects, and neurological problems, what has made it to the headlines and what has been highly debated in the scientific and popular literature has been the seemingly unrelenting offensive on the stability and reliability of the human male reproductive capacity and sexual orientation. A few examples:

- The evidence of a worldwide decrease in sperm counts and sperm motility and quality, and the subsequent proliferation of supporting research (Tummon and Mortimer, 1992).
- The effects of *in utero* exposure to high doses of estrogen or the potent synthetic estrogenic drug diethylstilbestrol (DES) on the fertility of male offspring. (Wilcox , Baird, Weinberg, Hornsby, and Herbst 1994; Raloff 1994a).
- A decline in the "normal" birth sex ratio of 1.06–1.0 male to female (Davis, Gottlieb, and Stampnitzky 1998).
- An international increase in cases of hypospadias and cryptorchidism in male infants (Paulozzi 1999).[10]

The expressions of alarm in both the scientific community and the popular media of falling sperm counts, male infertility, deformed genitals, and disappearing baby boys were countered with equally forceful denials criticizing the claims that environmental contamination by endocrine-disrupting POPs, including pesticides, plastics, and solvents, were placing male reproduction and sexuality at risk. Some scientists challenged the validity of extrapolating the endocrine disruptor thesis from wildlife to humans (Safe 2000), and other commentators blamed lowering sperm counts and infertility on "lifestyle" choices, such as drinking, smoking, obesity, and wearing too-tight underpants (Larkin 1998). Writing in the *National Review,* conservative analyst John Berlau dismissed the endocrine alarmists as being manipulated by the proliferation of man-hating feminists: "Whereas man-made chemicals used to be characterized as the Grim Reaper, they're now a stand-in for Lorena Bobbitt" (1995, 45). Evidence of "toxic trespass" challenged societal assumptions about male virility and invulnerability to harm and raised the alarm of a masculinity at risk. The reactions would fall into two camps: the endocrine disruptor thesis deniers, who vehemently rejected the suggestion that *real* men could be negatively affected (generally the "conservative" position) and the thesis proponents (tending toward "progressive" environmentalists),

who were troubled by the chilling proposition that endocrine disruptors were perverting humanity's natural sexual dimorphism, blurring the natural divide between men and women and producing abnormal bodies—feminized males, intersexed individuals, and hermaphrodites. Either way, denial or panic, the virulent debates about toxic assaults by estrogenic chemicals on male reproductive capacity were not simply about an impending human health problem, but about a newly troubled masculinity threatening to "throw into question not just gender but all of the social order" (Daniels 2006, 69).

Fallout from the Endocrine Disruptor Thesis: The Persistence of and Challenge to Eco-Normativity

As mentioned above, the endocrine disruptor thesis (renamed as HAAs) was taken up by the panel of experts assembled by the NAS in the late 1990s to critically review the scientific literature on the subject of hormone-related toxicants in the environment and their impacts on wildlife and human populations. The final report published in 1999 would reflect the seventeen-member panel's deep disagreements and concluded that the data were inconclusive, especially in respect to humans. Confirming the results of research documenting worldwide increases in rates of hypospadias, cryptorchidism, testicular cancer, and changing sex ratios, the NAS report concluded that the causes of these conditions is unclear and that they could not definitively be "linked to exposures to environmental HAAs at this time" (NAS 1999, 135).

On an international scale, most environmental scientists, endocrinologists, and toxicologists are in agreement that the weight of the scientific evidence implicates the global spread of POPs in population decline and extinctions of many species of wildlife and in the rising rates of many serious human health problems (Schapiro 2009; Steingraber 1997, 2007; Whitty 2007). Despite the U.S. government's claim that the evidence is "inconclusive" and that more research is needed, other countries have taken action to protect the public health and the environment by banning the most dangerous and commonly used chemicals (e.g., the European Union's ratification in 2004 of the United Nations Stockholm Convention on POPs).

Given this overall consensus on the problem of toxic contamination, how are concerned scientists, environmentalists, and other "progressive" analysts engaging with the endocrine disruptor thesis in the 2000s? I am interested in the contradictory ways that even progressive environmental

science and policy circles can mobilize socially sanctioned heterosexism and queer-fear in order to generate public interest and a sense of urgency to act on this serious environmental problem. Do the knowledge politics surrounding the endocrine disruptor thesis function to set off a sex panic relying on the assumption that the public would react more strongly to news of impending gender perversions and would consider this prospect even more frightful, unnatural, and unacceptable, than other more ordinary concerns such as environmentally induced cancers, asthma, and heart disease, normalized diseases that are killing people in alarmingly high numbers?

Cynthia Daniels (2006) argues that some conservatives blame feminism (rather than endocrine disruptors) for the feminization of men and the erosion of natural masculinity (as evidenced in lowered sperm counts and developmental disorders, but also in the increased numbers of women in the workplace and women students outnumbering men at universities). Yet, in what ways can even feminist environmentalisms unwittingly call upon these same assumptions of eco(hetero)normativity in their critical analyses of the unnatural disruptions that underlie social and environmental injustices? And, how might we develop a more proactive (rather than polluted) politics that argues for the integrity, security, and health of bodies, homes, families, and communities without reproducing the eugenics discourse of the "normal/natural"?

Feminism, Multiculturalism, and the Unearthing of Environmental Normality

To reiterate my fundamental argument, I fall squarely in the ranks of the proponents of an anti-toxics environmental justice–ecofeminist politics and am outraged at the indifference and foot-dragging that has been the modus operandi of government regulators and the corporate lobbyists who are in bed with them. There is good reason for alarm concerning the continued use and accumulation of toxic chemicals that are wreaking havoc on the health and reproductive possibilities of the living world. Our cumulative exposures to endocrine disruptors, carcinogens, neurotoxins, asthmagens, and mutagens in our normal, everyday lives from our daily contact with plastic water bottles, shampoos, and kitchen cleaners to insect repellants, food preservatives, and factory farmed meats, among others, are most certainly putting at risk the health of our own bodies and our earth. There is good reason for alarm, but where should the critical attention lie? The hyperfocus on the world turning into her-

maphrodites participates in a sexual titillation strategy summoning the familiar "crimes against nature" credo and inviting culturally sanctioned homophobia while at the same time sidelining and naturalizing "normal" environmental diseases such as cancer. This is not a good strategy either for coalition building or for developing a comprehensive politics of pollution prevention and environmental health justice. In the following examples, I examine—in critical solidarity with—several progressive feminist, environmentalist, and reproductive justice scholars' and activists' anti-toxics strategies, analyzing both the mobilization of and resistance to environmental normativity. In each example, my goal is not to argue with a particular author's rank order of socially critical priorities (race or gender or class or sexuality), but to examine through an inclusive environmental justice lens how appeals to the natural and normal in anti-toxics discourse stressing toxic chemicals' threats to natural sexuality, gender balance, and the balance of nature (1) tend to de-emphasize (and normalize) the many other health and reproductive effects of toxic chemical exposure (e.g., increased rates of cancer and other diseases) increasing morbidity and mortality rates, and (2) may unintentionally reinforce the oppressive ideology of heteronormativity and limit coalition politics across a diversity of social and environmental issues.

. . .

In his dynamic and popular slide presentation, "From Silent Spring to Silent Night," endocrinologist and amphibian biologist Tyrone Hayes (2007) frankly admits that he is a man with a message and has chosen to "cross the line" to become a scientist-advocate, urging his audiences to take action against the widely used herbicide and known endocrine disruptor atrazine. In the late 1990s, the Swiss-owned biotech giant Novartis (now Syngenta) approached Hayes, asking him to conduct scientific studies on the dose-response effects of its big money-maker, atrazine (at the time the most commonly used herbicide, which has only recently been eclipsed by glyphosate, commercially known as Roundup and manufactured by the Monsanto Corporation). The company-sponsored research was intended to provide proof of the chemical's safety as it was up for review and reapproval by the EPA. Syngenta was confident that atrazine, long thought to be nontoxic at concentrations below 3.0 parts per billion (ppb), would pass with flying colors, but Hayes's thorough investigation showed otherwise.

Starting in 1998, Hayes grew frog larvae in water samples collected from ponds and streams from agricultural regions in Wisconsin, Minne-

sota, and Indiana, some of which had been treated with atrazine and others that had reported little or no use. He grew the larvae in water samples containing a wide range of atrazine concentrations and then observed the developmental stages of the growing tadpoles and mature frogs. Within months of starting the research Hayes was surprised to find that doses of atrazine as low as 1.0 ppb were inhibiting the growth of the larynxes of male frogs (making them sound like female frogs and therefore unattractive and unable to mate), and at levels as low as 0.1 ppb (thirty times lower than the level the EPA allows for drinking water) Hayes observed intersex frogs with both ovaries and testes. Exposed frogs exhibited levels of the male sex hormone testosterone ten times lower than the control group of untreated animals. Hayes ultimately demonstrated that atrazine exposure stimulates the rate of production of aromatase, an enzyme that converts testosterone to estradiol, a potent form of estrogen, thereby "feminizing" male frogs or creating "hermaphroditic, demasculinized frogs" in up to 90 percent of exposed animals (Hayes 2002; Hayes, Haston, Tsui, Hoang, Haeffele, and Vonk 2002).

When in 1999 Hayes delivered his research findings to Syngenta, the company was less than impressed. Thus began a widely publicized, Hollywood-worthy story (complete with mysteriously disappearing data, federal officers dispatched to protect him if he testified at EPA hearings, and environmental lawyers advising him to stay in a different hotel each night) of a heroic battle between corporate malfeasance and a young scientist in the pursuit of truth whose integrity was not for sale.[11] Clearly, Hayes is working in hostile territory as he works to publicize his frightening tale of an approaching time when croak-free "silent nights" may become more common as amphibian populations throughout the world are decimated from exposure to widely available and EPA-approved endocrine-disrupting agricultural chemicals. Yet, by upfront appealing almost exclusively to the looming threats to eco-normativity, his equally powerful information on other lethal wildlife and human health problems become tangential.

By his own account, Hayes is "several standard deviations from the norm" (Royte 2003, 156). As one of only a handful of African Americans in the rarified field of endocrinology, Hayes talks about his childhood roots in South Carolina exploring the reeds and mudflats of the Congaree Swamp, and his father's urging him to study hard and pursue his passion for biology. Hayes earned a scholarship to Harvard University, completed his Ph.D., and accepted an academic job at UC Berkeley. In his early thirties he became the youngest full professor in the university's history.

Hayes's laboratory in UC Berkeley's Department of Integrative Biology has attracted scores of undergraduate and graduate students of color and has remained the most diverse in the sciences. He prides himself on having large lecture classes in biology that are nearly 20 percent African American at a university where fewer than one percent of the scientists are black. Arguing that "diversity makes science better," Hayes has been committed to promoting ethnic diversity in his department because "people from different backgrounds have different perspectives and take different approaches to the same problem" (Parks 2005, 3). A practitioner of rigorous scientific research, Hayes also believes that science must be more accessible to the general public and that scientists cannot separate themselves (their histories, families, and ethics) from the knowledge they are generating, especially if it could help people who may be disproportionately exposed to chemicals such as atrazine. Articulating an environmental justice perspective, Hayes states:

> As scientists we're arguing in front of the EPA, but the farmworkers and the public don't ever know about it. Ethnic minorities and people of low income are more likely to hold the "unskilled" laborer positions in agriculture and pesticide production that would put them at higher risk of exposure. They are also least likely to have access to the emerging science demonstrating the dangers of that exposure. So this environmental and public health issue is also a racial/social justice issue because minority and working class people are the primary targets of pesticide exposure. (quoted in Thomas 2006, 19)

Hayes's recognition of his own incongruousness in the predominantly white, high-status world of bioscience and his willingness to deviate from the political norms of science clearly situate him as an outsider within. Even though his own research and his critical review of others' research on the wildlife and human health effects of exposure to low levels of atrazine reveal a long list of potential health problems over and above its feminizing and gender-bending effects—including the stunting of frog growth, leading to smaller mouths that are not large enough to catch and consume its usual prey and thus leading to starvation, or frogs' much higher susceptibility to parasitic infections resulting in massive frog die-offs—his truly electrifying presentations highlight for his audiences that what really is *not normal* are the facts of "chemical castration" and "demasculinization."[12]

Likewise, the observations of human responses to atrazine exposure through drinking contaminated water have demonstrated a higher rate of breast cancer in women and prostate cancer in men. Workers at Syngenta's atrazine plant in St. Gabriel, Louisiana, were reported to suffer cancer rates more than three and a half times greater than the Louisiana statewide average (Thomas 2006, 20). Despite the availability of data on these dire consequences of toxic chemical exposure, Hayes (and others) lead with the "imperiled normal" and generally achieve the desired response.[13] At the start of his lecture, "From Silent Spring to Silent Night" (2007), Hayes establishes *both* his outsider status (minority racial and working-class background, the integration of personal, political, and participatory policies in his scientific practice) *and* his normality (pictures of his parents and his wife and children). This stage-setting assertion of heteronormativity effectively sets up the norm against which the deformed frog bodies are contrasted and works to create the impression that atrazine's greatest danger is the threat to gender norms, the family, and the stability of the society. What gets lost in this chilling story of sexually and physiologically deformed frog bodies, I argue, is his important main point—that his research provides clear evidence of what is causing the massive decline in amphibian populations and, more important, that lacking swift regulatory action and responsibility from government and industry, this lethal situation could also be humanity's fate. Challenging certain norms but reasserting others, Hayes's decision to foreground atrazine's demasculinization of male frogs and the creation of abnormal hermaphrodites as his take-home message while de-emphasizing the other harmful health effects may play into culturally acceptable queer-fears, and may limit its coalitional possibilities and broader objectives of social justice. Such broad-based and sustained political coalitions are what will be required to demand effective government and industry action to prevent environmental contamination.

. . .

In her meticulously researched article, "Gender Transformed: Endocrine Disruptors in the Environment," environmental historian Nancy Langston focuses on the history and toxicology of endocrine disruptors providing important historical details on the physiological and environmental consequences of living in a "sea of estrogens," which she fears may be "changing the nature of gender" (2003, 133, 130). Langston sets out to examine and substantiate the biological/material realities at the root of

gender, which she describes as being under siege by the many industrial and commercial endocrine-disrupting chemicals that have polluted our bodies and environment since the 1930s. Critiquing what she considers to be the postmodernist-feminist turn away from the facts of biology, Langston argues that "sexual differentiation is not just a cultural construction" (148) and insists upon the overwhelming truth of the hormonal determinism of gender:

> Postmodernists like to imagine that gender is culturally constructed, and clearly cultural forces do shape the expression of gender differences in our society. But gender is also profoundly biological. Hormones control the biological construction of gender, and now hormone mimics may control the biological deconstruction of gender as well. To complicate matters, cultural constructions influence the biological constructions of gender because behavior, social interactions, and expectations can all change the ways our bodies produce sex hormones. On a more direct level as well, culture alters the biological control of gender differences because many of the chemicals our culture produces have powerful effects on hormonal functions. (133–34)

Chronicling in careful detail the list of examples from both animal and human studies of how "hormones create gender" and how hormonally active agents are "seriously confusing [our] genitalia" (136), Langston hammers home the point that the normal gender regime (both bodies and behaviors) is being damaged, a dire situation that portends an uncertain future. As a biologist, environmentalist, and feminist, Langston persuasively critiques the Western philosophical nature/culture divide and argues that one of our "fondest illusions" is that we can separate ourselves from the natural world:

> What we do know is that we're all in this together: the atrazine that gets sprayed on my neighbor's cornfields ends up in the river water, then in the fish, then in the herons and the raccoons that eat the fish—and it also ends up in my breasts, my belly, and my blood. What's out there in wildlife and wild places is also in our bodies . . . endocrine disruptors connect environmental histories of the body with environmental histories of wild places and wild animals. (153)

Langston's arguments urging feminists to rethink materiality are most effective and invite greater possibilities for a politics of articulation

with other discourses of interrelationship and justice when she demonstrates clearly the damage to health and the environment that occurs when humans do not integrate the "intimate" and the ecological and imagine instead our bodies as separate from, unaffected by, and unconnected to our environments. On the other hand, her writing forecloses on potential articulations when she appeals to corporeal and environmental normality: "Our most intimate reproductive environments, the places that make us most female or most male, the places we are most vulnerable and most natural, may have been hijacked by the residues of our industrial world. This is a disturbing thought" (154). The move to locate the danger of an unbridled and unjust industrial society in the callous hijacking of our sexual dimorphism ends up obscuring our vulnerability to the wide range and diversity of hormonally sensitive diseases and physiologic changes, including, for example, pancreatic cancer and early onset of puberty. This too is a disturbing thought.

Invoking the "naturalness" of binary gender, Langston raises the specter of a crisis of heteronormativity, thereby eclipsing a comprehensive analysis of toxins in the environment that would more fully interconnect ecosystem cycles and "intimate" bodily/physiological systems, what I have called an *embodied* ecology.

. . .

The publication in 1997 of Sandra Steingraber's *Living Downstream: An Ecologist Looks at Cancer and the Environment* established her as an important voice in the anti-toxics environmental movement. Focusing on the environmental links to cancer—as compared to *Our Stolen Future,* published a year earlier, which described itself as moving "*beyond* cancer" to focus on the presumably more serious problems of hormonal disruption and dysfunctional sexual reproduction—*Living Downstream* became the industry standard for environmental writing that blended the personal and the political and made accessible to a broad audience the scientific information and controversies relating to the increasing rates of cancer worldwide. Steingraber's later book *Having Faith: An Ecologist's Journey to Motherhood* (2001) again combines personal and scientific inquiry to examine her own pregnancy with her daughter Faith—an unexpected event, she explains, as she had been presumed infertile after her diagnosis and treatment for bladder cancer at the age of nineteen. With its focus on the effects of exposure to environmental toxins at every stage of maternal and fetal development during the nine months of pregnancy, *Having Faith*

takes up more directly than her earlier work the endocrine disruptor thesis and examines the potential effects of the global distribution of POPs on human reproductive capacity. One reviewer succinctly summed up the overall message of the book: "[Steingraber's] findings strongly suggest that having a healthy child today is even more of a miracle and is increasingly threatened" (Miller 2002, 2).

Steingraber's subsequent work looked at historical trends in the onset of puberty in girls and represents her most in-depth foray into the field of endocrine disruption and its impacts on sexuality and sexual "disorders."[14] In a monograph on the subject, "The Falling Age of Puberty in U.S. Girls: What We Know, What We Need to Know" (2007), Steingraber overviews what is known about the trend of earlier pubertal age by reviewing the literature in the fields of epidemiology, endocrinology, toxicology, and evolutionary biology, as well as in sociology, child development, nutrition, veterinary medicine, media studies, and anthropology. Her broadly interdisciplinary investigation reveals information about pubertal trends that is widely accepted and also information that is uncertain and inconclusive. The preponderance of the evidence shows that breast development (thelarche) and menstruation (menarche) are both occurring earlier in the lives of U.S. girls, with the age of thelarche falling more rapidly. In addition, the average age of menarche among U.S. girls steadily declined throughout the first half of the twentieth century, and the rates differed markedly among racial and ethnic groups. The average menarchal and thelarchal ages of African American and Latina girls are lower than those of white girls. Theories about the triggering mechanisms driving these trends show less consensus in the literature, but what is known is that low birth weight, premature birth, obesity, and environmental exposures to endocrine-disrupting chemicals can set off the neuroendocrine apparatus controlling pubertal onset.[15]

Throughout the voluminous study, Steingraber's analysis consistently speaks to the multitude of factors—biological, environmental, and social—that have contributed to this change in the sexual development of U.S. girls, and, although her focus is on the age of puberty, she insists on connecting this problem to a wide array of health and social risks for girls and women. In the preface, she opens by connecting the issue of "early puberty" to women's health: "Early puberty—in particular, early menarche—is a known risk factor for breast cancer" (2007, 2). She continues:

> In the puberty story, so many variables are interwoven and interdependent that, as I began to trace the threads of causality to their

> beginning points, I sometimes felt as though I were caught in a Mobius strip. For example, obesity raises the risk for early puberty in girls, but weight gain itself is a consequence of early pubertal development. And risks for both obesity and early puberty are raised by being born to small or too soon—risks for which are modulated by maternal exposure to certain environmental chemicals during pregnancy. (4)

The monograph then lays out the evidence demonstrating the complexity of the interactions among the diverse social and physiological health risks that are associated with early puberty, including reduction of complex brain function and the brain's ability to recover from injury, slower bone growth, breast cancer, obesity, diabetes, polycystic ovary syndrome, depression, teenage pregnancy, low performance in school, and cardiovascular diseases (32–37).

As a scientist-advocate (much like Hayes and Langston), Steingraber offers suggestions for proactive and preventative "actions that can be taken on the basis of what is already known" (16), which include: strategies to phase out or ban the endocrine-disrupting chemicals to which girls are exposed (including phthalates and bisphenol A) and endorsement of action-based monitoring policies such as the California Environmental Contamination Biomonitoring Program, which in 2006 became the first statewide monitoring system to test for the presence of toxic chemicals in the bodies of the population at large and in targeted studies of communities of concern; strategies to tackle childhood obesity, including offering healthy food in schools and opportunities for sports and physical activity; investments in urban agriculture and farm-to-school programs; availability of non-organochlorine cleaning and pest control products for use in homes and schools; strategies to lower preterm and low-weight births by providing affordable prenatal care; elimination of air pollution and mercury contamination from coal-fired power plants; and community-based strategies promoted by the environmental justice movement to "lower the combined burden of psychosocial, socioeconomic, and environmental stressors, which disproportionately affect poor and minority communities" (17).

Adopting a "weight of the evidence" methodology (Krimsky 2000, 232), Steingraber's work represents an anti-toxics approach that demonstrates the interconnection of environmental and health problems with gender, class, and racial injustices. Rather than resorting to the discourse of environmental normality to drive home her point, she stresses the cen-

trality of health and well-being and offers a host of alternative strategies that she argues will ensure a healthy and sustainable environment for all. Insisting on the articulation of all of these diverse factors, Steingraber concludes:

> Because it arises from a combination of many different stressors in several different aspects of the environment—psychosocial, nutritional, behavioral, chemical—early puberty in girls is not a trend that will be reversed by single actions by single-purpose agencies. It is a multi-causal threat to the well-being of girls and women that ultimately requires a comprehensive, integrated, unified response. . . . The environmental justice community, with its long experience with cumulative risks and impact, has many insights to offer here. Any meaningful attempt to mitigate the problem of early sexual maturation in girls must draw on the collective wisdom of its leadership. (2007, 97–98)

. . .

In "Changing Sex," a chapter in the book *Courage for the Earth,* the anthology of writings published in 2007 in celebration of the centennial of the birth of Rachel Carson, Janisse Ray, the award-winning author of *Ecology of a Cracker Childhood,* a social and ecological memoir of growing up in a rural, poor, white, Southern community, writes:

> In the past two decades, study after study has shown what Rachel Carson predicted. Chemicals are disturbing normal hormone-controlled development, affecting gender, sex, and reproduction. . . . In Florida's Fenholloway River, mosquitofish females developed a male sex organ called a gonopodium and attempted to mate with female fish. The scientific term for dual sex anatomy is *intersex,* which means an abnormal presence of traits of both sexes in one specimen . . . smallmouth bass in the South Branch of the Potomac River [were almost all] intersex in that they contained immature eggs in their testes. (2007, 112–13)

Ray declares that she is not a chemist and "loves macro, not micro" so would much rather be writing about "ancient mountains" and "caribou running like a low dark cloud across the Arctic plain in advance of the oil drillers" (115) than about "life-threatening" invisible chemicals. In the literary nonfiction style reminiscent of Carson and Steingraber, Ray blends the personal voice with her no-nonsense, straight-talking explanations

of the science of endocrine-disrupting chemicals to narrate the story of her awakening to this particularly disturbing information pointing to the phenomenon of changing sex. One of the early experiences alerting her to the dangers of endocrine disruptors is recounted in the story of meeting Tracy and C. B., a young couple living on a farm in Vermont who had decided to eat locally, buy organic, and eliminate all plastics, phthalates, and bisphenol A from their lives. As Ray writes, "Tracy was a woman in her late twenties, with strawberry blond hair . . . and wore long skirts" (117). Describing C. B., on the other hand, was a little trickier: "C. B. is Tracy's husband, but we were at first confused because he looked like a woman, with a feminine figure and delicate features. He wore jeans and a plain T-shirt, his dark hair cropped short" (117).

Ray then relates her awakening to the existence of transgender people by describing her childhood friend Anna, who had recently confessed that she had "always felt like a boy and was going to change her sex" and would soon become Andrew (124). But, as Ray explains,

> This is not a story about being transgender. That subject is too personal, too political, too nuanced. On occasion I had met transgender people. But at Tracy and C. B.'s home, for the second time in a month, I was sitting with a transgender person. Suddenly I was calling a friend who looked like a she a he. He, him, his. I was watching my young friend Anna/Andrew using the men's bathroom, and listening to him tell me about not being able to check either gender box on job applications. (124)

Getting the courage to ask the "politically incorrect question" to Tracy and C. B. as to whether they thought C. B.'s transgender identity might be connected to endocrine disruption, Ray was surprised when they both nodded yes and immediately mentioned Christine Johnson, a transgender author and administrator of the Web site trans-health.com who has published articles on the issue of the link between endocrine disruptors and the increased numbers of trans people (Johnson 2004). Quoting Tracy, Ray expresses her own politically correct position on this issue of changing sex: "I don't think that being intersex or being trans is a problem, any more than being just male or just female is a birth defect. But when we start having babies who are developing in one direction and switch them chemically to develop differently, it shows that chemicals are powerful and are affecting us at levels many of us are exposed to on a daily basis" (125).

While Ray—who has raised awareness of classist and racist assumptions in the environmental movement through her environmental memoir on growing up poor, white, and Southern—acknowledges her potentially "politically incorrect" stance and her ignorance of "gender variance," it seems these social/bodily "ambiguities" are easier attributed to a poisoned environment than to normal human sexual difference. The other health impacts of hormonally active chemicals are mentioned briefly in her chapter, but they pale next to the specter of environmental contamination causing sexual abnormality.

As an homage to Rachel Carson's legacy, Ray's essay appropriately points to the risks to reproductive health in humans and other animals that are associated with exposure to endocrine-disrupting chemicals. In her widely read book, *Silent Spring,* Carson cites the link between the carcinogenicity of the chlorinated hydrocarbons such as DDT to the human reproductive system and their known toxicity to the liver, one of the organs associated with the maintenance of healthy hormone levels in the body (Carson 1962, 207). In other words, Carson explains, exposure to DDT (which would later be classified as an endocrine-disrupting chemical) compromises the liver's capacity to maintain hormone balance, which could potentially lead to cancers of the reproductive organs in men and women and could increase the risk of reproductive problems, including infertility. Although the connections Carson made among DDT, cancer, and reproductive disorders (including possible genetic damage) compelled then secretary of agriculture Ezra Taft Benson to wonder "why a spinster with no children was so concerned about genetics" and the problems of human reproduction (Lear 1997, 429), her writing never worked to instigate a selective sex panic. Granted, Ray is writing in a different historical moment, but her expressions of terror at the prospect of changing sex without a serious engagement with either trans people themselves or with the literature theorizing how "power in contemporary society habitually passes itself off as embodied in the *normal*" (Dyer 1997, 45) participate in the reinforcement of compulsory eco(hetero)normativity and may limit the possibilities for diverse environmental coalitions.

. . .

The community-based organization Asian Communities for Reproductive Justice (ACRJ), based in Oakland, California, develops what its

leaders call an "intersectional" analysis of reproductive justice that articulates the many social, economic, cultural, and environmental factors affecting the lives of poor and low-income Asian and Pacific Islander (API) communities in the East Bay region. As the organization's executive director, Eveline Shen, explains:

> Our goals are to address reproductive freedom within a social justice context, because we realize that you can't disentangle the issues that intersect with reproductive freedom that are most important to the communities we work with, which include immigrant rights, workers rights, queer rights, environmental justice, educational justice, ending violence against women, and the empowerment of youth. . . . Reproductive justice is really about fundamental changes in individual, community, and institutional power structures. (2005)

Popular education approaches are at the center of ACRJ's organizing strategy, which is committed to leadership development and focuses on action-based research and educational and political campaigns identified as important to the local community. One such campaign, the fight against IES (Integrated Environmental Systems), a waste management company that owned and operated two solid-waste incinerators located in East Oakland, brought the ACRJ in alliance with a San Francisco Bay Area-wide environmental justice coalition helping to expand the grassroots base of the local environmental justice movement and introducing critical gender and reproductive justice components to the coalition's environmental justice frame (Shen 2005). Other campaigns have helped to broaden the reproductive justice movement by building alliances with a wide range of social justice and mainstream women's organizations.[16]

The ACRJ's youth program, SAFIRE (Sisters in Action for Issues of Reproductive Empowerment) joins together reproductive and environmental justice issues in their initiative known as POLISH (Participatory Research, Organizing, and Leadership Initiative for Safety and Health). The project focuses on women's and girl's exposure to chemical toxins in beauty products both personally as consumers and on the job as beauty/nail salon workers (80 percent of whom are Vietnamese immigrant women). Partnering with Asian Health Services, UC Berkeley's School of Public Health, and the NIH, the POLISH project examines the cosmetic industry's continued use of reproductive and developmental toxins such as dibutyl phthalates in its products and joins with statewide and nationwide efforts to mandate stronger FDA regulation of personal care products. Committed to a coalition politics that does not pit en-

vironmental protection against economic security, the POLISH project deploys a community-based participatory action research approach that connects the environmental health, safety, and livelihood concerns of both consumers and workers (Shah and Paredes 2005). The intersectional politics practiced by the SAFIRE activists link reproductive justice and environmental justice issues and have created a movement of young API women who now identify themselves as "environmentalists," and who are becoming community leaders in the San Francisco Bay Area.

With the commitment to respond to the needs and concerns of all members of the community, ACRJ organizers recognized that the focus on reproductive justice was not resonating with the large queer and trans community with whom many of the organization's leaders identified and worked. Striving to broaden further their concept of reproductive justice, organizers have deepened their analysis to further challenge the heteronormative construction of the body and sexual binary models of reproduction and have focused on how bodies are defined and affected by social, economic, *and* environmental injustices. ACRJ communications director Diana Yin Ming explains: "Discussions of the body as the site of analysis are very metaphorical and political and often focus on symbols and representations, but the body is also very literal and material, and what's happening in our workplaces, homes, communities, and environments have a very specific impact on all our bodies" (Ming 2007).

Speaking directly to the necessity of forging a coalition politics to counter the full range of assaults on reproductive justice—including environmental contamination—Eveline Shen calls for "an integrated analysis, holistic vision, and comprehensive strategies that push against the structural and societal conditions that control our communities by regulating our bodies, sexuality and reproduction. This is the time to come together across issue areas, across separate change efforts, and across identities to achieve this vision" (2006, 14). Shen argues that "toxic pollution creating reproductive disorders affects us all" and that "focusing on the abnormality of intersex frogs rather than on how oppressive political and economic systems such as globalization are creating injustices that affect our self determination and the self determination of *all* beings, including the frogs!" is a divisive strategy. She asserts that effective coalitions between reproductive and environmental justice issues enable "all people to have the economic, social, and political power and resources to make healthy decisions about our bodies, sexuality and reproduction for ourselves, our families and our communities" (Shen 2007).

Conclusion: Queering Environmentalism, Refiguring the World

Environmental theory and politics in the United States have historically mobilized ideas of the normal, or what Rosemarie Garland-Thomson refers to as "the normate," that is, "the social figure through which people can represent themselves as definitive human beings" (1997, 8), to determine which bodies and environments/landscapes *embody* the distinctly American values of productive work, rugged individualism, masculinity, independence, potency, and moral virtue, upon which environmental advocacy movements should be based (e.g., Haraway 1989; Cronon 1991). Critical histories of U.S. environmentalism have revealed the capitalist, patriarchal, colonialist, heteronormative, eugenicist, and ableist histories underlying its "progressive" exterior (e.g., Boag 2003; Darnovsky 1992; Evans 2002; Gaard 2004; Jaquette 2005; Sutter 2001). In this chapter, I have examined the residues of what I have called eco-normativity (or, eco[hetero]normativity) that appear in the alarmist discourse of the anti-toxics arm of the environmental movement, residues that, I argue, appeal to pre-existing cultural norms of gender balance, normal sexual reproduction, and the balance of nature. The deployment of the anti-normal or anti-natural in anti-toxic discourse is questionable political-ecological strategy and can work to reinforce the dominant social and economic order (the forces actually behind environmental destruction and toxic contamination of all our bodies and environments) by naturalizing the multiple injustices that shore it up. In short, this unexamined toxic discourse produces *polluted politics* even while claiming to stand for diversity and justice.

I have also examined feminist and environmental justice *challenges* to normal environmentalism, which, I argue, are *queering* ecological thinking and creating new possibilities for genuine coalition politics with the aim of disrupting the social power of eco-normativity. The question remains: Can the environmental coalitions we develop succeed in calling for stronger environmental protections, the right to a healthy body, and the need for sustainable communities in such a way that resists appeals to normalcy and normativity? And, furthermore, can our coalitions be capacious enough to embrace and care for *all* community members (human and nonhuman) even in their "irrevocable difference" (Clare 2001, 361)?

In closing, I return to Clare's creative politics of articulation, in which he links queer and disability theorists' critiques of the compulsions of heterosexuality and able-bodiedness together with the environmental justice movement's redefining of nature and environment as "community" and

"home." While those bodies, communities, and environments that stray from the "normate" may be hated, impoverished, and poisoned, Clare maintains that seeing and knowing from *non*-normate positions may offer outsider views for imagining new, just, and sustainable ways of living on the earth—our home. "And as for the lies and false images, we need to name them, transform them, create something entirely new in their place, something that comes close and finally true to the bone, entering our bodies as liberation, joy fury, hope, a will to refigure the world. The body as home" (12).

NOTES

1. See Di Chiro (2003), LaDuke (1997), and Stein (2004), for more discussion about this conceptual and political intervention.

2. The United Nations Environment Programme (UNEP) established a program on POPs in the late 1990s, which set in motion the organizing of the UN Stockholm Convention on Persistent Organic Pollutants, held in 2001 to address the global circulation of these dangerous compounds and to protect human health and the environment. Parties to the Stockholm Convention agree to eliminate or reduce the twelve identified POPs of greatest concern: aldrin, chlordane, DDT, dieldrin, dioxins, endrin, furans, heptachlor, hexachlorobenzene, mirex, polychlorinated biphenyls (PCBs), toxaphene.

3. For overviews and recent research findings, see the Science and Environmental Health Network (SEHN), http://www.sehn.org/ and the Collaborative on Health and the Environment (CHE), http://www.healthandenvironment.org/.

4. A reference to the size of the penises of alligators found in Lake Apopka, Florida, a body of water abutting a federal Superfund site.

5. A reference to the lowered sperm counts observed in wildlife and humans from around the world.

6. Published after the BBC documentary *The Estrogen Effect: Assault on the Male* was aired in September 1994.

7. For example, see Birnbaum 1995; Colborn, Vom Saal, and Soto 1993; El Bayoumy 1993; Hunter and Kelsey 1993; and Sharpe and Skakkebaek 1993.

8. The crux of the endocrine disruption thesis was that some exogenous compounds (both natural and synthetic) can interact with hormonal systems by either (1) blocking or mimicking receptor binding, (2) altering the rates of hormonal synthesis or metabolism, or (3) affecting receptor availability. The list of known endocrine-disrupting chemicals that were of central concern to the conferees includes: DDT and its degradation products, DEHP (di)2-ethylhexyl)phthalate), dicofol, HCB (hexachlorobenzene), kelthane, kepone, lindane and other hexachlorocyclohexane congeners, methoxy-chlor, octachlorostyrene, synthetic pyrethroids,triazine herbicides, EBDC fungicides, certain PCB congeners, 2,3,7,8-TCDD and other dioxins, 2,3,7,8-TCDF and other furans, cadmium, lead, mercury, tributyltin and other organo-tin compounds, alkyl phenols (nonbiodegradable detergents and anti-oxidants present in modified polystyrene and PVCs), styrene dimers and trimers, soy products, and

laboratory animal and pet food products (Wingspread Conference Statement, July 1991).

9. The use of the language of "disruption" was opposed by some scientists from the National Research Council, who argued instead for the term HAAs (hormonally active agents) because, they argued, there exist several chemicals, such as plant-based estrogens, that are hormonally active but are not known to cause harmful effects. The term HAAs preserved "the distinction between chemicals that interact with hormone receptors or other hormone-mediated pathways and chemicals that cause adverse physiological effects on an organism" (Krimsky 2001, 22).

10. Hypospadias refer to a developmental condition in which the urethra opens on the underside of the penis or on the perineum instead of at the tip of the glans penis. Cryptorchidism is a condition in which one or both of the testicles fail to descend during fetal development from the abdomen cavity to the scrotum. Both of these conditions have been associated with infertility, testicular cancer, and other health problems.

11. See Pierce (2004) and Thomas (2006).

12. Hayes's Powerpoint presentation includes several slides displaying cross-sections of the atrazine-induced "feminized testes" of exposed Northern Leopard frogs. For most nonbiologists, a scientific slide of a cross-section of a frog testis sprouting ovaries appears as a brown, grainy background with clumps of lighter-colored masses scattered throughout. To help elucidate the slide for the audience and to draw attention to this gonadal abnormality, large arrows point to bundles of cells labeled "ovaries" or "testes," and the words "NOT NORMAL" are stamped across the image in upper-case, bright-red letters. To view the slide, see http://www.youtube.com/watch?v=z4lijvIjpRw at 10:27.

13. In earlier conversations with Hayes, he told me that during his presentations on the dangers of atrazine his audiences regularly express the two responses of either denial or panic that I discussed earlier. Specifically, he explained, burly, white male farmers from Wisconsin tended to represent the *deniers* ("That's about frogs, not us men!"), and male farmers in Angola reacted with *alarm* ("Smaller penises? Gender-bending? No way!"), resulting in the Angolan government banning atrazine. Author's personal communication, University of Massachusetts, Amherst, May 2, 2005.

14. Puberty in girls is signaled when the brain instructs the ovaries to begin secreting estradiol, which results in breast development (thelarche) and the onset of menstruation (menarche). Another brain signal stimulates the secretion of androgens from the adrenal gland, which results in pubic hair growth (pubarche).

15. Another recently published study on endocrine disruptors' dangers to women and girls also presents a complex analysis of the health risks associated with exposure, rather than the exclusive focus on these toxins destabilizing maleness and gender balance (Collaborative on Health and the Environment 2009).

16. For example, ACRJ partnered with a wide coalition of organizations, including the ACLU, Planned Parenthood, the League of Women Voters, immigrants' rights organizations, and educational reform groups, to defeat Propositions 73 and 85, ballot initiatives put on the California special elections in November 2005 and again in the general elections in 2006, to amend the state's constitution to prohibit a physician from performing an abortion on an unemancipated minor until forty-eight hours after the doctor notifies in writing the minor's parent or guardian, except in the case of a medical emergency or with a parental waiver. For more information on the defeat of these propositions, see http://www.smartvoter.org/2005/11/08/ca/state/prop/73/, and http://reproductivejustice.org/download/Prop85/ACRJDefeating85.pdf.

REFERENCES

Alford, R. A., and S. J. Richards. 1999. Global Amphibian Declines: A Problem in Applied Ecology. *Annual Reviews in Ecology and Systematics* 30: 133–65.

Amphibian Decline Is Rapidly Worsening. 2006. *Associated Press*. http://www.msnbc.msn.com/id/6249901/.

Auger, J., Jean Marie Kunstmann, Françoise Czyglik, and Pierre Jouannet. 1995. Decline in Semen Quality among Fertile Men in Paris during the Past 20 Years. *New England Journal of Medicine* 332 (1995): 281–85.

Barringer, Felicity. 2008. Hermaphrodite Frogs Found in Suburban Ponds. *New York Times,* April 8, D2.

Berkson, L. D. 2000. *Hormone Deception*. Chicago: Contemporary.

Berlau, John. 1995. Case of the Falling Sperm Counts. *National Review,* June 26, 45–48.

Birnbaum, L. S. 1995. Developmental Effects of Dioxin. *Environmental Health Perspectives* 103: 89–94.

Boag, Peter. 2003. Thinking Like Mount Rushmore: Sexuality and Gender in the Republican Landscape. In *Seeing Nature through Gender,* ed. Virginia Scharff, 40–59. Lawrence: University Press of Kansas.

Bryant, Bunyan, and Paul Mohai. 1992. *Race and Incidence of Environmental Hazards*. Boulder, Colo.: Westview Press.

Bullard, Robert.1994. *Unequal Protection: Environmental Justice and Communities of Color*. San Francisco: Sierra Club Books.

Cadbury, Deborah, writer and prod. 1993. Documentary. The Estrogen Effect: Assault on the Male. *Horizon*. London: British Broadcasting Corporation.

———. 1998. *The Feminization of Nature: Our Future at Risk*. London: Penguin Books.

Carson, Rachel. 1962. *Silent Spring*. Boston, Mass.: Houghton Mifflin.

Clare, Eli. 1999. *Exile and Pride: Disability, Queerness, and Liberation*. Cambridge, Mass.: South End Press.

———. 2001. Stolen Bodies, Reclaimed Bodies: Disability and Queerness. *Public Culture* 13.3: 359–65.

Colborn, Theo, and C. Clement, eds. 1992. *Chemically Induced Alterations in Sexual Development: The Wildlife/Human Connection*. Princeton, N.J.: Princeton Scientific Publishing.

Colborn, Theo, D. Dumanoski, and J. P. Myers. 1996. *Our Stolen Future: Are We Threatening Our Fertility, Intelligence, and Survival? A Scientific Detective Story*. New York: Penguin Books.

Colborn, Theo, F. S. Vom Saal, and A. M. Soto. 1993. Developmental Effects of Endocrine-Disrupting Chemicals in Wildlife and Humans. *Environmental Health Perspectives* 101: 378–84.

Collaborative on Health and the Environment. 2009. Girl Disrupted: Hormone Disruptors and Women's Reproductive Health. http://www.healthandenvironment.org/articles/doc/5492.

Cone, Marla. 1994. Sexual Confusion in the Wild. *Los Angeles Times* October 2, A1.

Cronon, William. 1991. *Nature's Metropolis*. New York: W. W. Norton.

Daniels, Cynthia. 2006. *Exposing Men: The Science and Politics of Male Reproduction*. Oxford, U.K.: Oxford University Press.

Darnovsky, Marcy. 1992. Stories Less Told: Histories of U.S. Environmentalism. *Socialist Review* 22.4: 11–54.

Davis, Leonard. 1995. *Enforcing Normalcy: Disability, Deafness and the Body*. London: Verso.

Davis, D. L., M. B. Gottlieb, and J. R. Stampnitzky. 1998. Reduced Ratio of Male to Female Births in Several Industrial Countries: A Sentinel Health Indicator. *JAMA* 279: 1018–23.
Di Chiro, Giovanna. 1996. Nature as Community: The Convergence of Environment and Social Justice. In *Uncommon Ground: Rethinking the Human Place in Nature,* ed. William Cronon, 298–320. New York: W. W. Norton.
———. 2003. Beyond Ecoliberal "Common Futures": Environmental Justice, Toxic Touring, and a Transcommunal Politics of Place. In *Race, Nature and the Politics of Difference,* ed. Donald Moore, Jake Kosek, and Anand Pandian, 204–32. Durham, N.C.: Duke University Press.
Dunne, Kyla. 1998. Teeny Weenies: Alligators in Florida's Lake Apopka have Smaller Penises. PBS interview, June 2.
Dyer, Richard. 1997. *White: Essays on Race and Culture.* New York: Routledge.
El-Bayoumy, K. 1993. Environmental Carcinogens That May Be Involved in Human Breast Cancer Etiology. *Chemical Research in Toxicology* 5: 585–90.
Evans, Mei Mei. 2002. "Nature" and Environmental Justice. In *The Environmental Justice Reader: Politics, Poetics, and Pedagogy,* ed. Joni Adamson, Mei Mei Evans, and Rachel Stein, 181–93. Tucson: University of Arizona Press.
Fox, Glenn. 2001. Wildlife as Sentinels of Human Health Effects in the Great Lakes-St. Lawrence Basin. *Environmental Health Perspectives* 109.6: 853–61.
Fry, D. M., C. K. Toone, S. M. Speich and R. J. Peard. 1987. Sex Ratio Skew and Breeding Patterns of Gulls: Demographic and Toxicological Considerations. *Studies in Avian Biology* 10: 26–43.
Gaard, Greta. 2004 (1997). Toward a Queer Ecofeminism. In *New Perspectives on Environmental Justice: Gender, Sexuality, and Activism,* ed. Rachel Stein, 21–44. New Brunswick, N.J.: Rutgers University Press.
Garland-Thomson, Rosemarie. 1997. *Extraordinary Bodies: Figuring Physical Disability in American Culture and Literature.* New York: Columbia University Press.
Guillette, Louis J., Timothy S. Gross, Greg R. Masson, John M. Matter, H. Franklin Percival, and Allan R. Woodward. 1994. Developmental Abnormalities of the Gonad and Abnormal Sex Hormone Concentrations in Juvenile Alligators from Contaminated and Control Lakes in Florida. *Environmental Health Perspectives* 102: 680–88.
Haraway, Donna. 1989. *Primate Visions: Gender, Race, and Nature in the World of Modern Science.* New York: Routledge.
Hayes, Tyrone. 2002. Hermaphroditic, Demasculinized Frogs Following Exposure to the Herbicide, Atrazine, at Ecologically Relevant Doses. *Proceedings of the National Academy of Sciences* 99.8: 5476–80.
———. 2007. *From Silent Spring to Silent Night.* Video of lecture, sponsored by the Friends of the Mississippi River, the Humphrey Institute for Public Affairs, St. Paul, Minnesota, March 23. http://www.youtube.com/watch?v=z41ijvIjpRw.
Hayes, Tyrone B., Kelly Haston, Mable Tsui, Anhthu Hoang, Cathryn Haeffele, and Aaron Vonk. 2002. Herbicides: Feminization of Male Frogs in the Wild. *Nature* 419: 895–96.
Hunter, D. J., and K. T. Kelsey. 1993. Pesticide Residues and Breast Cancer: The Harvest of a Silent Spring. *Journal of the National Cancer Institute* 85: 598–99.
Jaquette, Sarah. 2005. "Maimed Away from the Earth": Fitting Disabled Bodies Back into the Wilderness. *Ecotone* (Spring): 8–11.
Johnson, Christine. 2004. Transsexualism: An Unacknowledged Endpoint of Developmental Endocrine Disruption? M.A. thesis, Evergreen State College, Olympia.

Krimsky, Sheldon. 2000. *Hormonal Chaos: The Scientific and Social Origins of the Environmental Endocrine Hypothesis.* Baltimore, Md.: Johns Hopkins University Press.
———. 2001. Hormone Disruptors: A Clue to Understanding the Environmental Causes of Disease. *Environment* 43.5: 22.
———. 2002. An Epistemological Inquiry into the Endocrine Disruptor Hypothesis. *Annals of the New York Academy of Sciences* 948: 130–42.
LaDuke, Winona. 1997. Voices from White Earth: Gaa-waabaabiganikaag. In *People, Land, and Community,* ed. H. Hannum, 22–37. New Haven, Conn.: Yale University Press.
Langston, Nancy. 2003. Gender Transformed: Endocrine Disruptors in the Environment. In *Seeing Nature through Gender,* ed. Virginia Scharff, 129–66. Lawrence: University Press of Kansas.
Larkin, Marilynn. 1998. Male Reproductive Health: A Hotbed of Research. *Lancet* 352: 552.
Lear, Linda. 1997. *Rachel Carson: Witness for Nature.* New York: Henry Holt.
McRuer, Robert. 2006. *Crip Theory: Cultural Signs of Queerness and Disability.* New York: New York University Press.
Miller, Elise. 2002. Book Review: *Having Faith: An Ecologist's Journey To Motherhood* by Sandra Steingraber. *YES Magazine* (Summer): 9.
Ming, Diana Yin. 2007. Interview with the author, Oakland, March 31.
Mortimer-Sandilands, Catriona. 2005. Unnatural Passions? Notes towards a Queer Ecology. *Invisible Culture 9.* http://www.rochester.edu/in_visible_culture/Issue_9/ sandilands.html.
Myers, John Peterson, Sheldon Krimsky, and R. Thomas Zoeller. 2001. Endocrine Disruptors: A Controversy in Science and Policy. *NeuroToxicology* 22: 557–58.
National Academy of Sciences. 1999. *Hormonally Active Agents in the Environment.* Washington, D.C.: National Academy Press.
Parks, Clinton. 2005. Balance and Love. *Science* (October 7). http://sciencecareers.sciencemag.org/career_development/previous_issues/articles/2005_10_07/ balance_and_love/(parent)/12097.
Paulozzi, L. J. 1999. International Trends in Rates of Hypospadias and Cryptorchidism. *Environmental Health Perspectives* 107: 297–302.
Pierce, Alison. 2004. Bioscience Warfare. *SF Weekly,* June 2, 1.
Raloff, Janet. 1994a. That Feminine Touch: Are Men Suffering from Prenatal or Childhood Exposures to "Hormonal Toxicants"? *Science News* 145.4: 56–58.
———. 1994b. The Gender Benders: Are Environmental "Hormones" Emasculating Wildlife? *Science News* 145.2: 24–27.
Ray, Janisse. 1999. *Ecology of a Cracker Childhood.* Minneapolis, Minn.: Milkweed.
———. 2007. Changing Sex. In *Courage for the Earth: Writers, Scientists and Activists Celebrate the Life and Writing of Rachel Carson,* ed. Peter Matthiessen, 109–28. New York: Houghton Mifflin.
Roberts, Celia. 2003. Drowning in a Sea of Estrogens: Sex Hormones, Sexual Reproduction and Sex. *Sexualities* 6.2: 195–213.
Royte, Elizabeth. 2003. Transsexual Frogs. *Discover Magazine* 24.2: 155–63.
Safe, Stephen. 2000. Endocrine Disruptors and Human Health: Is There a Problem? An Update. *Environmental Health Perspectives* 108 (June): 1.
Schapiro, Mark. 2009. *Exposed: The Toxic Chemistry of Everyday Products and What's at Stake for American Power.* White River Junction, Vt.: Chelsea Green.
Shah, Aparna, and Dana Ginn Paredes. 2005. Interview with the author. Oakland, October 31.

Sharpe, R. A., and N. F. Skakkebaek. 1993. Are Oestrogens Involved in Falling Sperm Counts and Disorders of the Male Reproductive Tract? *Lancet* 341: 1392–95.
Shen, Eveline. 2005. Interview with the author, Oakland, October 28.
———. 2006. Reproductive Justice: Toward a Comprehensive Movement. *Mother Jones,* January/February. http://www.motherjones.com/commentary/columns/2006/01/reproductive_justice.html.
———. 2007. Interview with the author, Oakland, July 25.
Stein, Rachel, ed. 2004. *New Perspectives on Environmental Justice: Gender, Sexuality, and Activism.* New Brunswick, N.J.: Rutgers University Press.
Steingraber, Sandra. 1997. *Living Downstream: An Ecologist Looks at Cancer and the Environment.* New York: Vintage.
———. 2001. *Having Faith: An Ecologist's Journey to Motherhood.* Cambridge, Mass.: Perseus.
———. 2007. The Falling Age of Puberty in U.S. Girls: What We Know, What We Need to Know. San Francisco: A Report for the Breast Cancer Fund. www.breastcancerfund.org/puberty/.
Sumpter, John P., and Susan Jobling. 1995. Vitellogenesis as a Biomarker for Estrogenic Contamination of the Aquatic Environment. *Environmental Health Perspectives* 103, supp. 7: 173–77.
Sutter, Paul. 2001. Terra Incognita: The Neglected History of Interwar Environmental Thought and Politics. *Reviews in American History* 29 (June): 289–98.
Thomas, Pat. 2006. Sex, Lies, and Herbicides. *Ecologist* (February): 14–21.
Tummon, S., and D. Mortimer. 1992. Decreasing Quality of Semen. *British Medical Journal* 305: 1228–29.
Twombly, Renee. 1995. Assault on the Male. *Environmental Health Perspectives* 103.9: 802.
Ward, Barbara, and René Dubos. 1972. *Only One Earth: The Care and Maintenance of a Small Planet.* New York: W. W. Norton.
Whitty, Julia. 2007. Gone. *Mother Jones,* May/June. http://www.motherjones.com/news/feature/2007/05/gone.html.
Wilcox, Allen J., Donna B. Baird, Clarice R. Weinberg, Paige P. Hornsby, and Arthur L. Herbst. 1995. Fertility in Men Exposed Prenatally to Diethylstilbestrol. *New England Journal of Medicine* 332: 1411–16.
Wingspread Conference Statement. 1991. Statement from the work session on chemically induced alternations in sexual development: the wildlife/human connection. Wingspread Conference Center, Racine, Wisconsin, July 26–28. Reprinted in *Chemically Induced Alterations in Sexual Development: The Wildlife/Human Connection,* ed. Theo Colborn and C. Clement, 1–8. Princeton, N.J.: Princeton Scientific Publishing (1992).
Wright, Lawrence. 1996. Silent Sperm. *New Yorker,* January 15, 42–48, 50–53.