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Toxic Progeny: The Plastisphere and Other Queer Futures

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... the whole world can be plasticized, and even life itself.

—Roland Barthes, *Mythologies*

On April 11, 2014, the Norwegian newspaper *The Local* reported that Bjørn Frilund caught a large cod that, as he discovered as he was gutting it, had swallowed a dildo. Frilund speculated that the fish mistook the dildo for one of the multicolored octopi that are its usual food source and are common to the area. This is certainly not the first case of a marine animal mistaking a piece of plastic for food. Everything from whales to birds to turtles to bacteria have been documented consuming plastic (Tremlett 2013; Stephanis, Giménez, Carpinelli et al. 2013; Zettler, Mincer, and Amaral-Zettler 2013), presumably in a moment of misrecognition, or due to an inability to filter out the plastic that is now, in some parts of the ocean, six times more abundant than plankton (Andrady 2011; Law and Moret-Ferguson 2010). But what is interesting to me about this example is the explicit enmeshment and strange congruence of oceanic plastic as it ties into nonreproductive sex and queer futurity. Although silicone (the most likely material that the dildo was made from) is not what is normally grouped under the (very broad) term “plastic” because it is not derived from petrochemicals, it shares the same problem that plastic poses; that is, its non-decomposability. We are not certain how long plastic may stick around for, but as is now commonly known, plastic can be considered practically immortal. That is, the timescale for which plastic may biodegrade, meaning that it turns into something else (delineated from simply breaking

down, tearing, or becoming smaller), is on the order of thousands of years. Given this incredible longevity, plastic can then be understood as a non-filial human progeny, a bastard child that will most certainly outlive us. And it is heralding in a future in which—regardless of one's gender, sexual orientation, or religious beliefs—reproduction is increasingly decoupled from sex. Plastic is contributing to this non-reproductivity while birthing a future of strange new life forms adapted to deal with these chemicals. What kind of offspring is plastic? How might it intersect with questions of queer life and (non)reproduction? And, in light of our increasingly nonreproductive futures, might there be something to be learned from queer theory, and the embodiment of queer subjects that have never assumed biological reproduction to be the ultimate signifier of hope?

This essay will look to bring the worlds of plastic and queer theory together under the conditions of non-reproduction and extinction, a world where our progeny may not even be human much less our biological offspring. Here, I am following Nicole Seymour's assertion that "queer values—caring not (just) about the individual, the family, or one's descendants, but about the Other species and persons to whom one has no immediate relations—may be the most effective ecological values" (2013, 27). This fissuring of reproductive logic from biology could be one of the most important lessons in a world that is increasingly toxic. For, as Catriona Mortimer-Sandilands and Bruce Erickson write in *Queer Ecologies*, "Queer attachments work both to celebrate the excess of life and to politicize the sites at which this excess is eradicated" (2010, 37). To develop these ideas, I build upon and am indebted to feminist science studies scholars such as Nancy Tuana, Donna Haraway, and Mel Chen, among many others, who assert the inherently intertwined viscous porosity of our bodies, our multiple compositions, and the necessarily imbricated and implicated nature of that position.

PLASTIC

Plastic is a curious substance. The first fully synthetic polymer was made in 1907 by Leo Bakeland and patented in 1909. Made to replace other materials that were becoming increasingly scarce, it fueled an era of mass consumerism and the cheap replication and distribution of goods. Plastic is a generic category that describes about twenty different types of polymers. The five families of commodity plastics that make up about seventy-five percent "of the roughly one hundred billion pounds of plastic produced and sold annually in the United States . . . date from the golden age of polymer innovation, the years bookending World War II" (Freinkel 2011, 62). These families are: polyethylene (PET, HDPE, LDPE), which is primarily used for plastic bags, films, and bottles; polyvinyl chloride (PVC), which comes in a rigid form that is used for

pipes, doors, windows, and bottles, and in its flexible form appears as inflatable objects, toys, and imitation leather; polypropylene, which is used in a range of materials, often in textiles; polystyrene, most commonly associated with Styrofoam but which is also found in CD cases and "clamshell" containers; and polycarbonate, which is used in electronics, phones, as building materials, and in automotive and airplane construction. In the process of manufacturing these various polymers, other chemicals, called plasticizers, are added to make plastic heat resistant, or pliable, or, in the case of the dildo, orange. These chemicals, because they are not a part of the incredibly stable polymer bond that define plastics, often leach or off-gas into the wider environment. I will return to this problem later on.

Plastic can be understood as a magical substance, seemingly without essence. It can morph and shift into nearly any shape, become or replace almost any object. Its form and substance are one. It is all surface, all the way through. As Roland Barthes says in his short essay on plastic: "Its reality is a negative one: neither hard nor deep, it must be content with a 'substantial' attribute which is neutral in spite of its utilitarian advantages: *resistance*, a state which merely means an absence of yielding" (1972, 98). And this, I argue, is the trick of plastic. Through its seductive surface, its alchemical qualities, its mutability, we treat plastics as if they are ephemeral, somehow vanishing into the ether after they have been discarded.¹ This notion of plastic is reflected in its etymology, which refers to the ability to be molded, shaped, or formed.² Further, the common metaphorical associations of plastic with plasticity seem to reinforce its alchemical quality of endless transformation. We speak of the plasticity of culture, and use plastic as a metaphor to describe the adaptability of an organism to its environment, or the neural connections in our brains. But this notion of plasticity, and the appearance of plastic in virtually any form, serves to obfuscate the fact that plastic is actually incredibly durable, incredibly resistant. Plastic engages in brief, and sometimes quite spectacular, transformations at the beginning of its life cycle, but then is discarded, left with a molecular structure that holds onto its stability at all costs. It may influence its environment greatly, but remains immune to that environment's influence. Where other materials are subject to decomposition, plastic exists outside of the proper logics of decay and transformation, in its own category of creation, where microbes and bacteria have not yet widely evolved to use its incredible energy sources.³

Plastics, their smooth surfaces begging to be touched, caressed, squeezed, and bent, operate within what Tom Cohen has called the "Ponzi scheme logics of twenty-first century earthscapes [which] portray an array of time-bubbles, catastrophic deferrals, telecratic capture, and a voracious *present* that seems to practice a sort of tempophagy on itself corresponding with its structural premise of hyper-consumption and perpetual 'growth'" (2012, 14). Plastic is

the ultimate material of tempophagy, or time-eating, one that consumes the compressed bodies of ancient plants and animals, a process that took thousands of years, only to be transformed into a single-use take-out container. But as we know, the debts that we accumulate always demand to be repaid, with interest, and in this case the payment will be of the flesh. Rob Nixon (2011) has called this same paradigm one of slow violence, where violence is displaced and extended over time. Slow violence is difficult to represent as violence because the relationship between cause and effect often appears much later, or, as is the case with the bioaccumulation of persistent organic pollutants, in completely different organisms. Slow violence permeates national borders, exporting the deleterious effects, such as sorting of plastic waste, across the globe, while manufacturing plastic in the poorest areas of the United States.⁴ The difficulty of naming plastic pollution as a form of violence is the dispersed relationship of cause and effect: a particular illness or sensitivity induced by chemical exposure is hard, if not impossible, to trace back to a specific product, company, or even a specific chemical, given the fact that we are never exposed to just one chemical at a time.⁵ But this slow, attritional violence is precisely that which plastic, and plastic pollution, enacts: one that is not concentrated in a spectacular mediatized image, but rather distends over the surface of the planet, slowly accumulating.

Although plastics appear as mere surface, designed to be discarded, and are associated metaphorically with change and malleability, plastics are actually extremely obdurate materials, persisting, in the best estimates, for up to one hundred thousand years. In fact, the presence of plastic is one of the proposed markers of what is (unofficially) being called the Anthropocene. If the Anthropocene designates an era where human activity, under specific economic and political conditions (an era that scholars such as Jason Moore, Andreas Malm, and Donna Haraway have suggested would more properly be called the Capitalocene), has become the predominant factor in the chemical and geological makeup of the earth, then plastic is certainly a part of this. Among the possible markers for the beginning of the Anthropocene are the radionuclides that appeared with the first explosion of a nuclear bomb, the polyaromatic hydrocarbons from burning fossil fuels, lead contamination from petroleum, and plastic, all of which have left marks on the earth (Sample 2014). And, if part of what the Anthropocene asks of us, in its structural logic, is an imaginative enterprise to project into the future a geologist, archaeologist, or other interested person who will then examine the geologic record, plastic will definitely be a part of the embedded constitution of the earth, recording its arrival at the beginning of the twentieth century and its incredible ascension and proliferation from that point on.⁶

In fact, a new form of rock has already been designated under the term “plastiglomerate.” Plastiglomerate refers to an “indurated, multi-composite

material made hard by agglutination of rock and molten plastic. This material is subdivided into an in situ type, in which plastic is adhered to rock outcrops, and a clastic type, in which combinations of basalt, coral, shells, and local woody debris are cemented with grains of sand in a plastic matrix” (Corocan, Moore, and Jazvac 2013, 6). In addition to the ways in which plastic participates in the chemical transformation and composition of the soil, air, and water, through its manufacture and waste cycles, plastic here is literally etched into the rock, becoming rock. This type of matter is emblematic of an era where it is impossible to disentangle the “natural” from sociopolitical and economic formations. But despite the dramatic visibility of plastic literally becoming part of geology, it is in water that plastic really becomes a problem.

And here we come back to the fish. An object of pleasure becomes an object of slow starvation, lodged in the fish’s stomach. Most plastic waste, as the dildo illustrates, ends up in the oceans. This happens through a variety of mechanisms: plastic gets inadvertently blown from garbage trucks into lakes and rivers, where it then follows streams and sewage pipes out to the ocean, eventually ending up in one of the five gyres that are now known colloquially as the “garbage patches”; it can also enter the water supply directly by way of microbeads found in cosmetics and by washing synthetic clothes, where up to two thousand plastic fibers come off per wash and go down the drain (Youngsteadt 2011). Most of the plastics that end up in the ocean, unlike the perfectly intact dildo, are incredibly small. For although plastic doesn’t biodegrade, it does photodegrade (exposure to the sun causes it to break down) and it cracks, breaks, and tears with use. These fragments get smaller and smaller but they do not go away. “Microplastics”—plastics that are less than five millimeters—are becoming rafts of biodiverse ecologies for bacteria and viruses. Dubbed the “plastisphere,” more than a thousand different species were found to be living on a single piece of microplastic (Zettler, Mincer, and Amaral-Zettler 2013). It is unknown whether these bacteria and viruses were eating the plastic, or merely found it a perfect milieu. But in time, it is quite likely that these vibrant attached communities may develop complex bacterial societies, flourishing on their synthetic surfaces, eating each other and the vast sources of unlocked carbon energy, mutating and evolving. While it might not immediately appear to be startling to create new forms of microbial communities, microbiologist Ed DeLong asserts that, “Microbes are responsible for the health of the oceans. They shape the chemistry of the sea and the atmosphere. These organisms that we can’t even see are extremely important. These little guys control the biogeochemistry of our world. They are the stewards of our planet” (quoted in Helmreich 2009, 1–2). Given this, the fact that plastic is radically reshaping the ecological communities of the oceans will have significant impact on the rest of the oceanic ecosystem, and the earth as a whole. “Microbial oceanographers argue that marine microbes are central to life on

Earth, that the lowly microbe constitutes a force of leviathan significance” (Helmreich 2009, 5). It is impossible to say what impact microplastics will have, but it is certain that that impact, given the amount of plastic in the oceans currently and its projected increase, will be quite drastic.

In the proliferation of the plastisphere, the worlds of the megafauna, our world, may disappear. There is a strange way in which the future that we are inadvertently heralding may turn out to be much like the deep past. The incredible amount of plastic in the oceans may act not so dissimilarly from the runoff from agricultural production, as their chemical composition is closely related: causing massive algae blooms and consequent dead zones. As paleontologist Jeremy Jackson notes: “dead zones reverse the achievements of more than half a billion years of evolution to take us back to the Precambrian Era before the rise of animals” (quoted in Helmreich 2009, 13). The proliferation of complex bacterial societies may bring about all kinds of changes, but it seems unlikely that the continued accumulation of plastics in the oceans will be beneficial for humans or many other species. Plastic, as it becomes a part of the ocean, with its own ecologies, makes it impossible to clearly distinguish between the “natural” and “cultural.” As Stefan Helmreich notes: “Human biocultural practices flow into the putatively natural zone of the ocean, scrambling nature and culture, life forms and forms of life” (2009, 13). For this reason, Nancy Tuana (2007) insists on an epistemological resistance to the cleavage of the natural from the cultural, instead offering a feminist “interactionism” of viscous porosity, one where the rearranged molecules that are created in factories drastically reshape human and other-than-human worlds alike.

BACTERIAL LIFE: NO FUTURE

As plastics begin to transform the ecologies of the oceans, they are not only causing the formation of new kinds of ecosystems, but they also accumulate and disperse toxins. Plastics are composed of an array of chemicals, which I mentioned earlier, called plasticizers. Perhaps the most infamous of these is Bisphenol A (BPA), known for its “reproductive toxicity” (Cone 2013). This chemical, amongst many others collectively known as phthalates, literally blocks the human ability to reproduce, both through an overexposure to the hormone estrogen and by way of endocrine disruptors that mimic hormones in the body and replace their functioning, sometimes queering the gender of the body in which it resides. “Scientists have known since the 1930s that bisphenol A acts as a weak estrogen, allowing it at least two possible ways to cause static in the body’s normal hormonal conversations: by binding with estrogen receptors on cells and by blocking natural stronger estrogens from communicating with cells” (Freinkel 2011, 93–94). These chemicals cannot

be tasted, smelled, or directly perceived by our human sensorium; they are imperceptible at many levels but have specific and sometimes drastic effects on our, and multiple other species,’ bodies. Since the 1950s scientists began noting disturbing wildlife reports in many different parts of the world, from Denmark to the Great Lakes, that “involved defective sexual organs and behavioral abnormalities, impaired fertility, the loss of young, or the sudden disappearance of entire animal populations” (Colborn, Dumanoski, and Myers 1996, 10). Eventually, the same kinds of abnormalities began to be noticed in humans when, a few decades later, Niels Skakkebaek and his colleagues reviewed sixty-one studies from the United States, Europe, India, Nigeria, Hong Kong, Thailand, Brazil, Libya, Peru, and Scandinavia. “According to the data, average human male sperm counts had dropped by almost fifty percent between 1938 and 1990” (Colborn, Dumanoski, and Myers 1996, 9). This coincided with a jump in testicular cancer and genital abnormalities. What all these studies reveal is that the chemicals that we are adding to our environment, of which plastics play a central role, are directly interfering with our reproductive systems, and over time, our ability to reproduce.

As plastic enters directly into the water stream, there is an inadvertent allegiance between certain forms of queerness and the petrochemical industry. Plastics contribute to queerness, causing mutations and inhibiting sexual reproduction. Some of the effects of reproductive toxicity that arise due to the prevalence of plastic in the environment enact a queering of the body. As Max Liboiron asks: “Is feminization of male fetuses abnormal, or even pathological? Is it a form of harm? The lesbian, gay, bisexual, transgender and queer (LGBTQ) community has argued that it is not. So, too, has the chemical industry” (2013, 143). Here, the strange alliance between queer forms of life and the life form of plastic comes into stark relief. In addition to the outright transformation of the normative signs of gender, exposure to plastic chemicals has also been shown to affect behavior. As Susan Freinkel writes, “The boys with the highest fetal exposure to the phthalates DEHP and DBP had the lowest scores on typical boy play, such as pretending to shoot a gun. They were also more likely to prefer gender-neutral play, such as working on puzzles” (2011, 101). As phthalates mimic estrogen, there was less perceptible difference, both in terms of behaviors and in genital formation, for girls. Although plastics may be contributing to a future where there is less sexual difference, I do not want to endorse the widespread use of petrochemicals in our environment, or even to assume that behavior can be deterministically attributed to such chemicals. However, there is a need to acknowledge that these chemicals do seem to be queering our bodies, and the bodies of multiple species, in a manner and volume that seems to be unique to our historical present.⁷

As our ability to reproduce is literally being blocked by the chemicals that we encounter daily, the ever more shrill calls to maintain our reproductivity, and more so, the health of the child, come to be articulated. As Heather Latimer and Nicole Seymour have both pointed out, it is hard to avoid the trope of the child as the vision of the hope for the (environmental) future. And this trope is used both by so-called “pro-life” advocates as well as anti-GMO activists, each of whom “rely on a set of assumptions about the ‘natural’ biological reproduction of a ‘certain historically and culturally specific idealized family form’” (Sturgeon 106, quoted in Latimer 2014, n.p.). This reliance upon the figure of the child as the symbolic capacity to project a future, not only of biological reproduction but a certain kind of social reproduction, is incredibly pervasive. In an extract from *This Changes Everything* by Naomi Klein that appeared in the *Guardian Weekly*, Klein opens with a reference to her own son, who, she fears, may never see a moose. Her child is particularly enamored with a book about a moose, and so this moment of realization is coupled with a deep sense of grief. This rather over-sentimentalized call for action then proceeds to narrate Klein’s reproductive problems—we are told that she has had multiple miscarriages—coupled with her experiences covering the BP oil spill in the Gulf of Mexico in 2010. But her article then provocatively moves away from her own concerns about biological reproduction to a moment of trans-species empathy or bonding. She writes,

Spring is the start of spawning season on the Gulf Coast, and Henderson knew these marshes were teeming with nearly invisible zooplankton and tiny juveniles that would develop into adult shrimp, oysters, crabs and fin fish. In these fragile weeks, the marsh grass acts as an aquatic incubator, providing nutrients and protection from predators. “Everything is born in these wetlands,” he said. The prospects for these microscopic creatures did not look good. Each wave brought in more oil and dispersants, sending levels of carcinogenic polycyclic aromatic hydrocarbons (PAHs) soaring. And this was all happening at the worst possible moment in the biological calendar: not only shellfish, but also bluefin tuna, grouper, snapper, mackerel, marlin and swordfish were all spawning. Out in the open water, floating clouds of translucent proto-life were just waiting for one of the countless plumes of oil and dispersants to pass through them like an angel of death. If a certain species of larva was in the process of being snuffed out, we would likely not find out about it for years, and then, rather than some camera-ready mass die-off, there would just be . . . nothing. An absence. A hole in the life cycle. It was then that I let go of the idea that infertility made me some sort of exile from nature, and began to feel what I can only describe as a kinship of the infertile. (2014)

For although the figure of the child operates at the heart of this article, as the literal embodiment of hope, Klein’s description of slow violence, of suffering marked not by some spectacular event, but more ominously by “an absence,” “a hole,” opens up a kind of queer ecological imagination. Mirroring her own problems with fertility, she invokes a queer futurity that is marked by trans-species empathy and identification. The “kinship with the infertile” that Klein notes here might be the beginnings of a queering of social reproduction that would allow a different kind of narration to enter into the massive extinctions that we are currently witnessing, one that is less focused on individual reproductive capacity and the love and care that may accompany that, toward a love and care that extends outward, beyond one’s immediate biological family.

Our increasingly nonreproductive future, one filled with the rearrangement of hormonal systems that are often indexed to gender, and the differentiation of sex from reproduction, aligns with a queer politics as articulated by Lee Edelman in *No Future: Queer Theory and the Death Drive*. Edelman highlights the ways in which an appeal to the child elicits a social consensus that is impossible to refuse. In other words, it is politically impossible to be against the child. He writes,

That logic compels us, to the extent that we would register as politically responsible, to submit to the framing of political debate—and, indeed, of the political field—as defined by . . . reproductive futurism: terms that impose an ideological limit on political discourse as such, preserving in the process the absolute privilege of heteronormativity by rendering unthinkable, by casting outside the political domain, the possibility of a queer resistance to this organizing principle of communal relations. (Edelman 2004, 2)

In other words, reproductive futurism organizes political discourse and the social imaginary as the projected fantasy of continuance. In this, the figure of the child, decoupled from the experiences of actual children, or the adults that they may grow up to be, lies at the center. “That Child remains the perpetual horizon of every acknowledged politics, the fantasmatic beneficiary of every political intervention” (Edelman 2004, 3). This is especially true when it comes to environmental discourses, where the notion of reproductive futurity is precisely what we are called to protect, in the almost ubiquitous appeals to “protect our children.” However, what these discourses are often seeking to protect is not the health of any future child but rather the maintenance of a particular way of life. Despite the fact that we know what needs to change in order to end runaway climate change, that is, the drastic reduction in fossil fuels, we are confronted with the complete practical denial of this, both at the policy level and in our everyday habits of consumption and transportation.

It is by turning to the child, whom we can imaginatively project into a future that will serve as the beneficiary of our contemporary way of life, that we also short-sightedly justify our present actions. In other words, it is because we so desperately want to maintain our current forms of life and to pass them on to our children (or so the justification goes), that we blindly proceed to foreclose those very futures. That we want a “better” future for our children, so often translated into material and economic wealth, without considering the costs on other (poorer) children, or the actual children that will be birthed, we uphold an economic and cultural voraciousness that defies all logic.⁸

What might the lessons of queer non-reproductivity offer here, as they manifest in the negative social field that Edelman articulates, in the fact of overpopulation, overconsumption, and in the horrifying extinction rates of nonhumans that are occurring, in part, due to plastic? Queerness, in Edelman’s configuration, occupies a negative relation to the social that could furnish a particular kind of opposition. He writes: “Queerness names the side of those not ‘fighting for the children,’ the side outside the consensus by which all politics confirms the absolute value of reproductive futurism” (2004, 3). Here, queerness is not only aligned with a rejection of heteronormative coupling, and the social imperative of biological reproduction, but with an acknowledgment that the figure of the child stands in for the reproduction of the social order. Queerness, as vitriolically spat out by right-wing homophobes, *does* mean the end of the future, a non-teleological orientation to time that brings about a social disruption: “There can be no future for queers, chosen as they are to bear the bad tidings that there can be no future at all” (Edelman 2004, 30). It aligns itself with negativity, with a refusal to participate in the Symbolic or the social order, as such, and in this position there might be something to be learned for politics in our given moment. Edelman asserts that embracing negativity “[n]ot in the hope of forging thereby some more perfect social order—such a hope, after all, would only reproduce the constraining mandate of futurism, just as any such order would equally occasion the negativity of the queer—but rather to refuse the insistence of hope itself as affirmation, which is always affirmation of an order whose refusal will register as unthinkable, irresponsible, inhumane” (Edelman 2004, 4). In the face of wanting to acknowledge the horrifying future that is rapidly approaching, finding a way to live without hope as affirmation seems increasingly necessary. In distinction from Jose Muñoz’s (2009) claim that queerness exists as a future horizon, Edelman asserts “no future” for queers, and this, regardless of whether or not one may want to agree with Edelman, is already a reality for so many species where sex acts, of all kinds, most likely happen at regular rates, but reproduction increasingly does not. In other words, through the saturation of the world with the advents of modern chemistry, in the multiple forms of endocrine disruption, Edelman’s queer future is no longer a particular political

position, but rather increasingly bleeds into biological reality. Sex, regardless of its gendered arrangements, is increasingly unlikely to create children. Instead, sex is given over to pure *jouissance*, the rupture that constitutes the merger of pleasure and pain, the border on which those sensations cease to have any meaning in the pure intensity of sexual experience. This has always been the case, as Bruce Bagemihl makes clear in *Biological Exuberance* (1999). Forms of queer life in sex, coupling, and child-rearing exist across a huge range of species, as everything from monkeys to birds have homosexual relations or can be categorized as transgendered or gender queer. “Homosexual behavior occurs in more than 450 different kinds of animals worldwide, and is found in every major geographic region and every major animal group” (12). Biological life has always been in excess of the bare imperative of biological reproduction. But in our current moment, where species collapse and extinction are occurring at unprecedented rates due to a multitude of anthropogenic causes, this biological exuberance seems to have become a kind of biological detumescence. In the face of no future for many species, queer theory’s insistence on negativity may provide a useful model for rethinking temporality, social reproduction, and kinship.

Claire Colebrook, in her recent essay “Sexual Indifference,” calls attention to the myriad ways in which we think about extinction, and how sexual difference itself is premised upon a corresponding “necessary extinction.” She claims that sexual difference may not have a future, writing, “this logic of necessary and positive extinction—this necessary production of differences that will not survive—[. . .] is repressed in the shrill affirmation of the vitality of sexual binary difference” (2012, 177). Colebrook suggests an evolutionary becoming that does not assume the ability to sexually reproduce—a future at once more technological and bacterial. This future is, of course, already here. More and more, predominantly upper-middle-class people are turning to various forms of technological assistance to be able to conceive. And we are creating new and proliferating forms of bacterial life. In many ways, the increase of bacteria, resulting from the plastisphere among other places, may not be a bad thing, and certainly in the realm of gender and sex, it might be quite instructive for us humans to learn from bacteria. As Myra Hird writes,

“Bacteria are biochemically and metabolically far more diverse than all plants and animals put together” (Sagan 1992, 377). On their curriculum vitae, bacteria cross species barriers (indeed, bacteria cannot be referred to as a species), perform hypersex, pass on pure genes through meiosis, shuffle genes and successfully resist death. . . . Bacteria are not picky, and will avidly exchange genes with just about any living organism anywhere in the world, including the human body. Thus bacteria are beyond the female/male dichotomy of human discourse (Margulis and Sagan 1997, 89; Hird 2008, 239)

Plastic is contributing to this technobacterial future, helping to actualize it. These trajectories of reproduction without sexual difference, where sexual pleasure exists only for itself, disconnected from any biological imperative, where hormones and hormone disruptors blur and change sexual morphology without direct intent, are oddly, perversely, queer. Plastic co-occupies and modifies this queer nonreproductive futurity. It is not just that one thing (floating rafts of microbial diversity) can replace something else (biodiversity of the oceans). Without wanting to privilege forms of life that we, as humans, can more easily identify with, it is also necessary to remember that ecosystems depend on *certain* species. As Ursula Heise (2010) reminds us, extinction and biodiversity loss isn't simply about numbers. Species count does not equate with ecological functionality in any simple sense: keystone species are more important to particular ecologies. We need geographical and ecological distribution, not just numbers. Further, biological species are delineated based on Linnaean taxonomy, which makes species that do not reproduce sexually difficult to categorize. The bacterialization of the future is bringing much-needed awareness of the importance of bacteria to the ecosystem; while at the same time a future that is only composed of bacteria is one that would mark tremendous loss, grief, and culpability. We cannot simply "trade" current biodiversity for the bacterial future without recognizing our own implications, commitments, and responsibility for the extermination of one world while another is being birthed.

So then what does this leave us with? How do we think through increasingly queer futurities that might usefully threaten the Symbolic or social order, but that are also interfering with the biological continuance of life? In other words, how do we make the social order more queer while mitigating the destruction to life forms and queer forms of life? What kinds of allegiances might be made, or affordances found, both in a nonreproductive future, and in asserting a kind of feminist futurity away from this apocalyptic nihilism that subtends Edelman's argumentation? For here, despite how much I agree, viscerally, with Edelman and wish to align myself on the side of the complete destruction of the social order of which he speaks, when this queerness passes over into the realm of the biological, it is harder to uphold. The figure of the child necessarily does this work in Edelman's thought, merging the literal continuance of the species with a political futurism, but extending this outward (which, of course, was not his intention) to the most rapidly occurring mass extinctions the earth has ever seen (Glavin 2007, Kolbert 2014) seems ethically untenable. This is because this kind of nihilistic imaginary does the work of upholding the social order rather than acting in opposition to it. The extinctions that we are currently facing project "no future" asymmetrically. The privileged, white, heteronormative, reproductive couple that becomes the figure of the political future that Edelman wishes to foreclose, or at least not participate in, seems

to become more powerful under the current conditions of toxicity, rather than less. It seems important then to be able to imagine a future that acknowledges non-reproductivity and extinction while working to build queer, feminist realities for as long as humans may exist. For, as Jordana Rosenberg writes,

one worries that such "futural" imaginaries and apocalyptic aphrodisiacs are fundamentally conditioned by the legacy of the Cold War excision of revolutionary thought from the thinking of *the horizon*. Thus, rather than imagining a world in which the horrors of instrumental reason (with its attendant racist, eugenic, and exploitative logics) are directly confronted—and give way to a costewardship of/with the earth—the only possible outcome is extinction: of the species, of cognition, of the problem of the *socius tout court*. (2014, 8)

I wholeheartedly agree with the open political horizon that Rosenberg insists upon; however, in the face of rampant species extinction and the prediction of drastic human loss of life under the conditions of increasing chemical toxicity coupled with climate change a whole-hearted celebration of futurity seems naive. What is incredibly important in her position is the articulation that the move toward extinction is happening differentially, increasing the urgency to address social and political matters. In other words, the evacuation of the space of the future, rendered through the figure of extinction, enacts a different valence to Edelman's queerness, replacing it with a "no future" that refuses to acknowledge the slow suffering that has already begun. For, it may not really be the threat of the end that is an actual threat. Slow suffering and pain are far more terrifying than the clean break that "no future" implies. In the recorded deaths of sea creatures by plastic, the fish Frilund caught might have received a mercy killing. Being eaten by a fisherman, and therefore experiencing a death that was relatively quick, seems preferable to the slow starvation that would otherwise have been the fish's fate. It might be difficult to say what a fish feels, but I can't imagine that having one's stomach full of plastic, slowly starving to death, could, in any body, be anything but painful. The figure of apocalypse, then, seems far preferable to a world of slow decay.

QUEER TOXICITY

Without abandoning the political refusal that is necessarily entwined with Edelman's project, I want to think through what kinds of queer affordances might be possible that work to skew the social. How, in other words, to think about slow decline, a kind of gerontology, or crip theory for the current biosphere? Mel Chen's recent work on animacy and in particular on toxicity provides a useful starting point. Toxicity provides the advantage of not positing the possibility of a radical split, or a clean end. Toxicity is about a

kind of futurity that struggles to be hopeful, but is certainly not apocalyptic. Instead, toxicity, and the figure of queerness that she puts forth, recognize and privilege mutation, sickness, and the permutation of the body by its outside. Chen writes, “I suggest that queering is immanent to animate transgressions, violating proper intimacies (including between humans and nonhuman things)” (2012, 11). Extinction, or non-reproductivity, under this rubric cannot be neatly sealed off. Understood from this perspective, queerness allows for an ecological understanding that we are not impenetrable. Rather, we are composed of what surrounds us. Our bodies are permeable, they cross over in ways that resist categorization. The (heteronormative) assumption of the inviolability of the body is part of the foundational logic that allows for the bioaccumulation of toxins in the environment and in our bodies in the first place. Chen writes,

This internalization, even privatization, of immunity helps to explain the particular indignation that toxicity evokes, since it is understood as an unnaturally external force that violates (rather than informs) an integral and bounded self. This is what Cohen calls the “apotheosis of the modern body,” the abandonment of human’s integral relation to their environments and the insistence of a radical segregation of self and world fueled by a bellicose antagonism. (2012, 195)

To give up on the fantasy of extermination or apocalypse is also to give up the radical segregation of the world and its “bellicose antagonism.” Instead, toxicity forces us to reveal the ways in which we are multiply composed—of plastic, of toxins, of queer morphologies. The fiction of independence and impenetrability, Chen is quick to point out, is one that only a few bodies can bear. In fact, most of us already have a deep knowledge of the ways in which these categories are breaking down, and have never adequately functioned in the first place. For those who can afford it, this knowledge of the permeability of the body, and particularly to toxins, often results in the attempt to barricade bodies off from their surrounds. Barricading is precisely what underpins the logic of the emergence of plastics in the world to begin with, the fantasy that we can seal ourselves off from the outside world, providing a pure, clean surface that will preserve and protect. In seeking to refashion the molecular structure of organic and inorganic compounds, we believed so much in our own hubris that we seemed surprised to encounter negative consequences. But so many of us already know that this is a fantasy that can no longer be sustained.

Now that we are increasingly being impinged upon to acknowledge the porosity of our bodies, we need to find ways of *living with toxicity*, for it is certainly not going away. Here, Chen’s analysis of the relationship of toxicity to queer productivity is instructive:

I would be foolish to imagine that toxicity stands in for “utopia” given the explosion of resentful, despairing, painful, screamingly negative affects that surround toxicity. Nevertheless, I am reluctant to deny the queer productivity of toxins and toxicity, a productivity that extends beyond an enumerable set of addictive or pleasure-inducing substances, or to neglect (or, indeed, ask after) the pleasure, the loves, the rehabilitation, the affections, the assets that toxic conditions induce. (2012, 211)

Additionally, in our current moment, we might not want to neglect the queer productivity of new forms of life, such as that found on the plastisphere. For we have no idea what may die off in the next couple of hundred years, but some kind of life will definitely continue. In a world increasingly marked by toxicity and rapid climate change the processes of evolution, both cultural and biological, seem to propose rather queer solutions. Instead of completely balking in horror, retreating to eco(hetero)normativity, or seeking the refuge of perfectly contained apocalyptic narratives, might there be a way to live with this toxicity, coupled with its “despairing, painful, screamingly negative affects” and an acknowledgment that there might be something interesting and productive in a future where sex and gender increasingly morph, and where reproduction slows? In fact, might the proliferation of queer toxicities provide new avenues of biological proliferation? For, as Bagemihl writes, “the capacity for behavioral plasticity—including homosexuality—may strengthen the ability of a species to respond ‘creatively’ to a highly changeable and ‘unpredictable’ world” (1999, 251).

Just as plastics are inadvertently creating all kinds of new worlds, such as the plastisphere, in order to address the current situation ethically, we must also learn to accept all kinds of strange life forms, human and nonhuman, toward which we generate care, compassion, and commitment. We must learn from queer subjects to build worlds of familial care that are not bound by biology. We need to generate a sense of responsibility for our nonhuman progeny, these strange new forms of microbial life, while at the same time recognizing that their existence is predicated on the extinguishment of multiple other forms of life: humans, animals, plants, and bacteria alike. Evolution “allows a temporality of extinction in which no life-form can be considered normative, necessary or particularly worthy” (Colebrook 2012, 7–8), and there is certainly a necessary, queer lesson to be learned in this approach. But, as Colebrook and others have called for, when an economic system dependent on petrochemical proliferation is what is fueling this evolution, we who are deeply enmeshed and implicated in these systems need to take account of our queer children, these strange new bacterial communities, and our monstrous murders, the massive species deaths, and the deaths of the poor from climate change.

For the nihilistic, apocalyptic, or masculinist techno-fantasies of the future will only lead us to the continued reproduction of the social order. To acknowledge that the future will be queer, in the sense of completely disruptive, means finding a way to live with toxicity, extinction, and without the reassurance of the open horizon of the future. Toxicity provides a

(re-)solution to the question of what to do with the ambivalence of queerness only to the extent that it does not represent a choice: it is already here, it is not a matter of queer political agency so much as a queered political state of the present. . . . Nevertheless, an uptake, rather than a denial of, toxicity seems to have the power to turn a lens on the anxieties that produce it and allow for a queer knowledge production that gives some means for structural remedy while not abandoning a claim to being just a little bit “off.” (Chen 2012, 220)

The lessons of queer social structures, of families not based on biology, and lives not necessarily afforded protection from the state or other institutions of power, might be instructive in facing both our non-filial human progeny, and a world filled with increasing uncertainty. Instead of biological children, our plasticized, microbial progeny will offer a decidedly queerer world.

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NOTES

1. The conditions under which plastic may be able to decompose vary greatly. There have even been reports of certain bacteria and a fungus able to digest, and thus decompose, plastics under particular conditions (Kinoshita, Kageyama, Iba, Yamada, and Okada, 1975; Russell, Huang, Anand, Kucera et al. 2011). However, if plastic ends up in the ocean, the possibilities for it to decompose, especially when it sinks (which is quite common), become radically more limited. Anthony Andrady, a leading chemist on plastic and plastic pollution, has estimated that the life span of plastic is one hundred thousand years (Weisman 2007, 16). Since the material has been around for such a short period of time, no one really knows what its life cycle is.
2. The *Oxford English Dictionary* traces the etymological roots of plastic to the ancient Greek “πλαστικός that may be moulded, belonging to moulding or modelling, plastic.”

3. Even if bacteria or microbes were to develop to “eat” plastic, this might not necessarily bring with it the kind of solution to the problem of plastic’s obdurate nature that we are looking for. As Jennifer Gabrys points out, in “a 1970s science-fiction novel, *Mutant 59: The Plastic Eater* (Pedler and Davis 1971), imagines a scene where bacteria capable of biodegrading plastic run amok in London. Due to their reproductive success, the plastic-loving bacteria are able to multiply, chew through and dissolve entire plastic urban infrastructures” (Gabrys 2013, 218). Despite how much we might want to be rid of plastic, this science-fiction fantasy might serve as a warning to be rather mindful about the dissolution of plastic, given that it now comprises so much of our transportation, technological, and building infrastructures.
4. See Nancy Tuana (2007) for a brilliant analysis of the relationship between poverty and environmental racism in the state of Louisiana, which has an incredibly high concentration of PVC factories.
5. Max Liboiron (2013) argues that the need to definitively determine the exact relationship between environmental plastic pollution and its health effects would more usefully be understood through the framework of miasma.
6. Claire Colebrook eloquently elaborated on this point of the imagined perspective from the future in her talk at Anthropocene Feminism, a conference hosted by the Center for 21st Century Studies at the University of Wisconsin, Milwaukee (April 12, 2014, see czluwm.com/anthropocene/schedule/).
7. Giovanna Di Chiro (2010) importantly argues that the focus on infertility and the queering of the body by way of endocrine disruptors has often served to buttress what she calls an eco(hetero)normativity while limiting the ability to build a truly coalitional politics. I completely agree with her analysis, but what I would like to add is that the reproductive shifts are real and queer theory may have much to offer in terms of creating new models of the world that refuse normativity and that may help us to imagine ethical and empathetic movements across species.
8. In some environmental circles, a call to stop reproducing has elicited heated debates (Mullin 2014; Collings 2014). What is important to consider in the midst of these debates are the ways in which certain (wealthy and often white) children that are limited in number are consuming the resources that children in poor countries will desperately need and use at much lower rates.

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Hyper-Subjects: Finitude, "Sustainability" and the Maternal Body in the Anthropocene

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THE CONCEPT OF THE ANTHROPOCENE prioritizes a new paradigmatic scale seems to outweigh that of "the political": imagining deep time or the death of the human species as a result of climate change tends to negate the (relatively speaking) smaller-scale concerns of race, class, gender, or capitalism. While the feminist critique is often circumscribed by this political scale, and thus seems to be dwarfed or rendered obsolete by the geological, deep-time scale of the Anthropocene, examining issues of feminist concern from this geological perspective has profound implications for thinking not only of gender politics but also of how to construct something like the political at all in this new world. Suggesting a new and normative global politics is, of course, beyond the scope of this article, but perhaps we might begin to conceive of a political schema that would function more appropriately in light of this grander scale. At the very least we may begin to think the borders or limits of the species as it has existed in the modern era in a way that neither environmentalism nor posthumanism has yet been able to sufficiently tackle.

The Anthropocene marks the epoch in which human activities have caused global environmental changes that will leave their mark in the geological strata of the earth itself.¹ While the specific moments of its onset are contested, its beginnings are generally associated with the industrial revolution. Crutzen and Stoermer mark its onset at roughly 1800 with the beginning