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Proliferation, Action: Marine Plastic Pollution, Material Agency, and Affective Representation

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Seeing plastic as an actant rather than inert matter can help us better comprehend the effects of marine plastic pollution. In this essay, I read various texts that depict plastic as an actant, highlighting the ways they give narrative urgency to a crisis that we normally cannot see.

A major unforeseen consequence of the “Plastic Age” is the material’s ability to proliferate in innumerable sizes, shapes and colors throughout the marine environment worldwide.

(Moore, “Synthetic Polymers” 131)

Researchers have recognized marine plastic pollution as a significant issue since E.J. Carpenter and K.L. Smith published the first article on the topic in 1972 (Ivar do Sul and Costa 352). However, the problem did not attract significant public attention until 1997, when Captain Charles Moore of the Algalita Marine Research Institute discovered what is now commonly known as the Great Pacific Garbage Patch in the North Pacific Subtropical Gyre situated between California and Hawaii. The gyre’s circulating currents catch and hold debris, a phenomenon that concentrates garbage into a comparatively small area and thus makes marine pollution more visible than in other areas of ocean waters. Since 1997, four other garbage gyres have been discovered in remote locations around the globe, each of which are composed primarily of non-biodegradable plastic waste.

As haunting, physical reminders of the far-reaching and unimagined consequences of human practices, these patches have incited significant alarm among scientists, environmentalists, writers, artists, and the general public. Unfortunately, it is widely agreed that the problem has escalated beyond any single, comprehensive solution. Beyond the lifestyle changes and the incredible amount of resources required to completely rid marine environments of plastic, scientists have yet to find solutions for many of the problems caused by this type of pollution. Consequently, most work focuses on stalling the problem’s growth and mitigating its effects. To do so, activists face two related representational challenges in their efforts to educate the public and disrupt our dependence on plastic. The first is the problem’s severity—how does one effectively convey the seriousness of this issue without making it appear completely hopeless? Secondly, by nature of its dispersion across time and space, marine pollution is as difficult to visualize and represent as it is to halt and reverse.

Part of the challenge in confronting marine pollution stems from its refusal to obey clear spatial and temporal boundaries – its effects can be found all over the globe, in and out of the water, and appear permanent. Another challenge is that plastics defy the conventional view of matter as inert and inactive. The Great Pacific Garbage Patch, its siblings, and marine plastic pollution more generally thus demand that we rigorously re-theorize plastic as a force—an *actant*—that exists and

acts beyond its initial uses. As the epigraph above suggests, plastics act, change, and move in ways that we never imagined. Without meaning that plastics are *alive*, we might say that they have lives of their own.

To probe the emergent effects of synthetic polymers (plastics), I draw on theories of material agency and, to a lesser extent, Timothy Morton's work in object oriented ontology (OOO) to read a diverse set of texts that seek to interpret, understand, or represent the Great Pacific Garbage Patch and marine pollution in general.¹ The recent material turn in science studies, feminist theory, ecocriticism, and other strains of philosophical thought has begun theorizing the agency of matter, thus initiating an ontological and epistemological shift that would recognize nonhuman materials as actants. Such work calls into question the "dualistic paradigms of transcendental humanism" (Iovino and Opperman 450-451), which places the human into diametric opposition to anything nonhuman. Unlike transcendental humanism, which typically assigns agency only to the human, new materialism considers the possibility that nonhuman entities can be agents, even producers of knowledge.

When we think of matter in this way it becomes a "field of distributed agency" where humans share the ability to act "with countless other actors" (451), including, for example, rocks, germs, and food. This definition also invokes Bruno Latour's work on Actor-Network Theory, wherein he defines an actor or *actant* as a single or, more likely, an *assemblage* of nonhuman and/or human entities working as the doer of an action ("On Actor-Network Theory"). For Latour, an actor/actant is "something that acts or to which activity is granted by others. It implies no special motivation of human individual actors, nor of humans in general" (*Politics of Nature* 75). Following Latour, Jane Bennett uses the term *actant* to reference things' ability to act and effect change, a view that sees matter as "vibrant" and lively rather than passive and inert (viii-ix; 8-9).

For Bennett, an actant "is neither an object nor a subject but an 'intervener,'" similar to Deleuze and Guattari's concept of the "quasi-causal operator" (9). In Deleuzian terms, Bennett explains, the operator "is that which, by virtue of its particular location in an assemblage and the fortuity of being in the right place at the right time, makes the difference, makes things happen, becomes the decisive force catalyzing an event" (9). Latour, Deleuze and Guattari, and Bennett all counter the propensity to associate an actor with an autonomous self, instead putting forth a definition which sees an actor/actant as a coalition or group of individual, diverse entities working momentarily as one source of action. Bennett, who draws extensively from Deleuze and Guattari, provides this description:

Assemblages are ad hoc groupings of diverse elements ... Assemblages are not governed by any central head: no one materiality or type of material has sufficient competence to determine consistently the trajectory or impact of the group. The effects generated by an assemblage are, rather, emergent properties, emergent in their ability to make something happen ... as distinct from the sum of the vital force of each materiality considered alone. (23). Thinking of garbage gyres and the far more diffuse issue of plastic pollution in oceanic environments as constantly rearranging assemblages provides us with a theoretical and imaginative framework—a referent—that allows us more fully to comprehend the vastness, activity, potential effects, and complexity of this pressing ecological crisis.

It is also beneficial to think of plastic-dominated marine pollution as a *hyperobject*. Timothy Morton, who builds off of Graham Harman's pioneering work in object oriented ontology, addresses questions similar or adjacent to the new materialists, but places the ontology and phenomenology of objects at the centre of his inquiry. He defines hyperobjects as "things that are massively distributed in time and space relative to humans", such as global warming (1). The concept can help us think through ecological crises such as global warming that rupture temporal and spatial boundaries by seeming to touch absolutely everything and for much longer lengths of time than are easily imagined. Morton argues that hyperobjects are viscous, "they 'stick' to beings that are involved with them" (1) and are inherently "nonlocal" (38). In other words, "any 'local manifestations' of a hyperobject is not directly the hyperobject" (1). Hyperobjects also "involve profoundly different temporalities than the human-scale ones we are used to" (1). Finally, "hyperobjects are not just collections, systems, or assemblages of other objects" but "objects in their own right" (2). The "not just" clause is significant because it signals that hyperobjects are in fact composed of assemblages that may reconfigure and relocate constantly but are also permanent.

These concepts – the *actant*, *assemblage*, and the *hyperobject* – provide us with a means to theorize marine plastic pollution's amorphous form, threatening and unpredictable behaviours, and attritional, emergent effects. As a hyperobject, it spans beyond oceanic waters. It lurks in the plastic strand that affixes the sales tag to a new shirt. It is in the soda bottle dropped down the storm drain. Of course, it is also more than these two examples, but identifying small, local fragments of the nebulous hyperobject helps us visualize and discuss its scope. They render an amorphous problem tangible. It is therefore beneficial to think of garbage gyres not as discrete crises but as local manifestations and symbols of the much larger problem. Because of their relative density, garbage gyres make an otherwise abstract, fairly invisible problem immediate and provide an entry point into understanding plastic's material agency.

Once introduced into the marine environment, plastics engage with other entities like bacteria to create innumerable assemblages whose emergent effects are disastrous, complex, often unpredictable, and not easily understood or resolved. Charles Moore has identified "at least eight" significant problems caused by oceanic plastic, although none are well understood. Five of these illustrate the agential, coalitional way plastic acts with other entities. (1) Plastic traps and kills a wide variety of marine species "through drowning, strangulation, dragging, and reduction of feeding efficiency". (2) Marine species ingest plastic items that "mimic natural food" which can cause weakness and death. (3) Plastic functions as a host ("a substrata") for invasive species and can speed their migration to other areas. (4) Microplastics (< 5 mm) "are sources and sinks for xenoestrogens and persistent organic pollutants (POPs) ... and can be readily ingested by invertebrates at the base of the food web". (5) Finally, although most plastic is buoyant, sand and other debris cause many plastic pieces to sink onto the ocean floor, where it can hinder gas exchange, change the floor's composition, and harm sea floor inhabitants ("Synthetic Polymers" 132).

The active language Moore uses to describe these problems helps illuminate plastic's role as an actant: plastics are "sources," they "inhibit," they "mimic." Moore's list also begins to illustrate the overwhelming scope and complexity of this crisis while pointing to the necessity of breaking it down

into discrete, comprehensible parts. While they are treated as distinct issues for the purpose of summary, these problems are not necessarily discrete. This is not an argument against breaking down problems into digestible and perhaps individually solvable components. Nevertheless, seeing marine plastic pollution as a hyperobject offers us a different way to think through its nebulous shape, pervasive and far-ranging effects, and even the challenges we face in naming, representing, and combatting it. In other words, seeing it as a hyperobject allows us to conceptualize it as a whole.

Developing a theoretical framework and a language to render the invisible and most insidious plastic elements and their behaviours visible is especially important. As the subsequent discussion of recent literary and artistic representations will show, macroplastic debris (> 5 mm pieces) is far easier to see, represent linguistically and visually, and clean up than microplastics. But how do we adequately represent, reclaim, and dispose of plastic particles smaller than plankton? How do we fathom plastic that is no longer *in* the ocean but of it, or that has become a horrific “new age sand” (Moore, “Ten Years”)?

Some small plastics, like the scrubbing beads in facial exfoliants, enter the marine environment directly. However, larger plastics begin degrading almost immediately upon entry into the environment. Through sun exposure, oxidation, and further biodegradation, larger pieces eventually break apart into microscopic pieces (Ivar do Sul and Costa 353). Unlike macroplastics, microplastics move quickly, can be consumed by organisms at every level of the food web, and are extremely prolific (353). In addition to the internal abrasions, blockages, and other kinds of physical harm caused by ingesting microplastics, these fragments leach chemicals like phthalates, nonylphenol compounds, flame-retardants, and bisphenol A (BPA), which have detrimental effects on human and nonhuman species (Engler 12307-12308). Furthermore, because plastics are composed primarily of hydrophobic materials, they attract and absorb air- and water-borne pollutants (Engler 12305; Ivar do Sul and Costa 358). Consequently, oceanic plastics function as carriers for substances such as dioxins that have been proven to be persistent, bioaccumulative, and toxic (PBTs) (Engler 12302). However, plastic debris “is only a temporary sink for PBT substances” (12307). Once ingested, plastic transfers its toxic burden into marine species, where the PBTs concentrate in tissues and are passed onto larger predatory species and humans (12307).

The movement of PBTs across spaces, plastics, and bodies highlights what Bennett calls the “vibrancy” or activity of matter and Stacy Alaimo’s concept of trans-corporeality. For Alaimo, thinking of “human corporeality as trans-corporeality, in which the human is always intermeshed with the more-than-human world, underlines the extent to which the substance of the human is ultimately inseparable from ‘the environment’” (2). Furthermore, Alaimo argues, “by underscoring that *trans* indicates movement across different sites, trans-corporeality also opens up a mobile space that acknowledges the often *unpredictable and unwanted* actions of human bodies, nonhuman creatures, ecological systems, chemical agents, and other actors” (2; second emphasis mine). Recognizing the porosity of bodies and the *traffic* between human and non-human bodies, plant life, and non-living organic or inorganic entities allows us to consider the nebulous reach of a single trash bag (or a thousand) to infiltrate disparate ecosystems in unpredicted and unpredictable ways.

Unlike Ivar do Sul and Costa, who take a more politically distanced approach, for Engler and Moore, the unpredictable behaviours and as-of-yet-unimagined possible effects of plastic marine pollution are enough to necessitate radical policy, industrial, and lifestyle changes and innovative clean up efforts. Underlying their arguments for immediate change is an unspoken understanding that our “ethical considerations and practices must emerge from ... [an] uncomfortable and perplexing place where the ‘human’ is always already part of an active, often unpredictable, material world” (Alaimo 16-17). When we think of the human in this way, it becomes impossible to deny that non-living, nonhuman entities interact with us and other materials in ways that have significant effects.

At a 2010 independently organized TED Talk event on the Pacific Garbage Patch and plastics, Moore highlighted both the unpredictability of plastics and their ability to essentially hijack—or colonize—a marine environment and dramatically change the entire ecosystem. Plastic, he insists, may be unnatural and man-made, but it has become a part the ocean environment and taken on attributes and behaviours beyond our control. In the same talk, Moore also describes the problem as a “moving” and “variable” system (“Ten Years”). By describing what he calls the “mess” as an ever-changing *system*, Moore emphasizes the activity, movement, and unpredictable effects that take plastic marine pollution from simply a human-made problem to a hyperobject of shifting affective assemblages that wreak havoc on any ideas of neat ontological and spatial boundaries, human timescales, and failsafe technological solutions to environmental problems.

Most people will never see the centre of the Great Pacific Garbage Patch, and even if they did, it is difficult to tell whether or not the sight would be dramatic enough to convey the severity of the problem, since microplastics make up the majority of the debris. Making this problem visible—giving it shape, narrative, and drama—remains a significant task in helping initiate changes that will limit further pollution. In his work on what he calls “slow violence” and the environmentalism of the poor, Rob Nixon argues that to understand “often-imperceptible threats requires rendering them apprehensible to the senses through the work of scientific and imaginative testimony” (14). The writer-activist, then, “can help us apprehend threats imaginatively that remain imperceptible to the senses, either because they are too geographically remote, too vast or too minute in scale, or are played out across a time span that exceeds the instance of observation or even the physiological life of the human observer” (15). In other words, imaginative writing plays a crucial role in making “the unapparent appear, making it accessible and tangible” (15). While some of the artistic works on oceanic plastic I discuss next are literary, I want also to extend Nixon’s argument to encompass other forms of artistic representation. Indeed, to make such a hyperobject tangible – *knowable* – and invoke long-lasting, influential affective and intellectual responses, a wide variety of representational approaches and narrative forms are necessary. The authors and artists examined here all work to give marine plastic pollution an affective narrative, a comprehensible form, and a driving immediacy.

Creative nonfiction author and journalist Andrew Blackwell writes about the Great Pacific Garbage Patch in his collection on the world’s most polluted places. While Blackwell’s focus on carefully bounded regions limits the scope of his environmental critique and, at times, gives environmental crises clear and reassuring geographical borders (the pollution is *there*, but not *here*), his chapter on the garbage patch directly grapples with how best to represent what has often been

misleadingly called an island of trash. In 2009, Blackwell joined Project Kasei on a clean-up mission to the patch. Hoping to find the dramatic heaps of plastic waste the media coverage had primed him to expect, he instead “found the Pacific Ocean” (154).

For Blackwell, depictions of the patch as a solid island, even a continent, are dangerous misrepresentations that ultimately hinder activist efforts. “You will have heard of the Great Pacific Garbage Patch,” Blackwell writes,

an island of trash, formed by a giant vortex of currents that gathers all the eternal, floating plastic in the northern half of the Pacific Ocean into an endless, swirling purgatory, a self-assembling plastic continent twice the size of Texas. ... It’s not an island. ... There is no solid mass, no floating carpet of trash, no landfill. But it *is* real. (118, author’s emphasis)

Blackwell concedes that the image of a massive floating island of human-made plastic garbage twice the size of Texas is “irresistible” – it is dramatic, apocalyptic, and suggestive of the garbage gyre’s mass. But, as Blackwell iterates throughout the chapter, the drama and the solidity are both lies. The truth is much more insidious. Instead of calling it an island or even a patch, Blackwell suggests, “a more appropriate analogy would be that of an ecosystem” (119). He continues:

System is the key here, implying something much more complex than a simple floating object. From tuna-size hunks of Styrofoam ... down to microscopic pellets that hang in the water like artificial plankton, it is a vast, plastic simulacrum of the living ocean that is its host. And precisely because it is so complex, and so far from land, its nature is poorly understood. (119)

Like Moore, Blackwell’s emphasis on the patch as an unnatural ecosystem colonizing the oceanic environment contradicts misconceptions that see it as an inert mass merely taking up space by instead highlighting its activity. Following researchers and activists making similar claims, Blackwell argues that simply picking the trash out of the ocean will not arrest the problem—the plastic has already brought about seemingly irreversible changes.

When Blackwell and the crew are inevitably disappointed upon discovering there are no dramatic piles of floating plastic to see or retrieve even at the centre of the gyre, he realizes that his desire for a dramatic, horrific mass of garbage was preventing him from “appreciating the Garbage Patch for as it was: just as vast and problematic as we had expected, but deeply unspectacular. It required more than your eyes to grasp it” (147). Like Nixon, who looks to environmental writer-activists to give narrative shape to amorphous and unspectacular threats, Blackwell realizes that it is necessary to develop counter-imagery, even counter-narratives, that will dismantle our expectation and desire for visually spectacular environmental catastrophes. For Blackwell, the “Great Pacific Garbage Patch is a cautionary tale in environmental aesthetics”:

We seem to require imagery to go with our environmental problems. If we don’t have an image to be horrified by, we can’t approach the problem in our minds. But sometimes the imagery distorts our thinking, or becomes a substitute for the problem in the first place. And when there simply is no adequate image, we substitute others, creating islands where none exist. (147)

The issue, Blackwell argues, is that the Garbage Patch “isn’t a visual problem, and this conflict between the reality of the problem and its nonvisual nature is at the root of the plastic island

misconception” (148). He insists that we need a new image, one that is “compelling” while more clearly suggesting the dynamism and scale of the problem (148).

Blackwell subsequently likens the patch to a galaxy, a metaphor that invokes the idea of activity, assemblages, and the hyperobject presented previously: it “is like the Milky Way, an impossibly massive spiral that, because of its very vastness, is also phenomenally diffuse ... The most massive object in the universe visible to the naked eye is made mostly of nothing” (148). But even while Blackwell’s chosen metaphor, a galaxy, moves toward representing the scope of the problem, his continual emphasis on the gyre itself – the Garbage Patch singular – still suggests that the plastic is contained to a particular region, that it is relatively bounded. While Blackwell’s efforts to correct the prevailing image of the Garbage Patch as a relatively solid, if growing, island in the middle of the ocean and replace it with one that suggests its diffuse nature and amorphous shape are commendable, the metaphor and emphasis on the “patchiness” of the garbage galaxy fail to address the mobility and far-reaching effects of these plastic assemblages. On one hand, we might look at Blackwell’s essay as an analysis of a particular local manifestation of the oceanic plastic hyperobject, but his insistence on sites prevents him from thinking through material traffic, assemblages, and the ways spatial boundaries leak.

Poet Victoria Sloan Jordan and photographer Chris Jordan are both part of the Midway exhibition, a team dedicated to documenting the effects of plastic pollution on albatrosses and other marine species on Midway Atoll, the northernmost Hawaiian island. Midway Atoll is one of the most remote places in the world, located roughly midway between North America and Asia. Once a United States military base, Midway Atoll and its surrounding waters are now a designated wildlife refuge and only a few conservationists live on the island. Despite Midway’s remote location, it has been dramatically altered by human use, and the wildlife that live on it are largely affected by human activities elsewhere. Like the Pacific Garbage Patch, Midway Atoll is a testament to the unending reach and unforeseen consequences of human progress and development.

Like Blackwell, the Jordans hone in on a specific, local manifestation of plastic and its behaviours. Despite the specificity of their focus, plastic’s deadly effects on albatrosses, their work profoundly demonstrates the expansive reaches of plastic debris. Adult albatrosses frequently mistake plastic pieces for food, ingesting them and feeding them to their young. This causes internal abrasions and blockages, and can result in starvation from false feelings of satiation. These effects eventually – and sometimes quickly – kill the birds (Moore, “Synthetic Polymers”). For the Jordans, the birds symbolize the short sight of current consumption practices and the multiplying, catastrophic, and unpredictable emergent effects of plastic. Chris Jordan’s artist statement clearly articulates the birds’ symbolic function:

... the detritus of our mass consumption surfaces in an astonishing place inside the stomachs of thousands of dead baby albatrosses. The nesting chicks are fed lethal quantities of plastic by their parents, who mistake the floating trash for food over the vast polluted Pacific Ocean.

For me, kneeling over their carcasses is like looking into a macabre mirror. These birds reflect back an appallingly emblematic result of the collective trance of consumerism and runaway industrial growth. ... Choked to death on our waste, the mythical albatross calls

upon us to recognize that our greatest challenge lies not out there, but in *here*. (Jordan, “Artist Statement”)

Guilt pervades Jordan’s statement, and, by depicting the albatross as an almost otherworldly, innocent, and mythical creature, the statement becomes much more about the human than about the real albatrosses depicted in this art. Jordan depicts the plastic not just as an agentic entity, but explicitly suggests that it is an extension of the human, blurring the boundary between human and plastic.

A poem performed at the Pacific Garbage Patch TEDx Conference by Victoria Sloan Jordan conveys similar themes of guilt and the collision of plastic and human. Take these lines, which emphasize the troubling and affective metaphor of the plastic as human:

In a field of bunch grass and crumbling asphalt,

We gather in a circle

The dead albatross at our center,

Filled with questions, with colors too assertive

...

We have come to make sense of this embrace

To see the shapes of ourselves in these birds choked with plastic. (“Fall Equinox”)

The poem asks us to consider the unnaturally bright, rigid pieces of plastic as ourselves. This uncomfortable position demands that the viewer consider the ways she or he may personally contribute to the problem. In this way, for both the Jordans, the albatross becomes a mirror that forces the viewer to face their own guilt, complacency, and despair. “How painful it is to be seen,” Jordan remarks in “Kaleidoscope,” another poem from her TED Talk that likens the fatal plastic medley to a kaleidoscopic eye. “Kaleidoscope,” like “Fall Equinox,” asks the reader to consider our collective culpability, but positions the plastic surrounded by the decomposing flesh as a confrontational eye that demands we then look upon ourselves. Jordan’s elegiac poems move back and forth between asking the reader to lament the albatross’s death and to reflect on the far-reaching effects of human practices, including his or her own role in this crisis.

Like the poetry, Chris Jordan’s *Midway* portraits simultaneously serve as elegies to the albatrosses and meditations on the widespread effects of marine plastic pollution. Indeed, the grotesque images of deceased albatrosses confront the viewer with a systemic violence that is normally invisible and out of reach. In each portrait, the decomposing corpse forms a frame around the garish pile of plastic that rests where the bird’s stomach once was. The images play off the contrast in colour between techno-bright plastic and the dull tan and grey of the natural, the dead. The plastic pieces’ garish brightness suggests too a kind of life – of activity, of permanence – in juxtaposition to the body that is returning to the earth. This particular image, where the body lies on the sand, highlights the idea that the bird (representative of the Natural) will become a part of the sand, whereas the plastic (the Unnatural), will remain for some unimaginable length of time.



Image 1: CF000668, from the series *Midway: Message from the Gyre* (2009) by Chris Jordan [<http://www.chrisjordan.com/gallery/midway/#CF000668%2016x21>]

While the subject matter of the photograph is specific- a single bird transformed into a pile of bones, feathers, and plastic – it builds several layers of narrative. It compels us to think about the life and death of this specific bird, of course, but it also prompts us to think about other birds and the plastic itself. Where did each piece come from? How did it travel? How much damage has it caused? Most importantly, by prompting these kinds of questions, the image ultimately asks us to think about marine plastic pollution in its entirety. The portrait is only one example of the ways in which creative representation, be it literary, visual, or otherwise, can help us conceptually map this problem by bringing certain elements into stark relief.

While affective representations of marine plastic pollution's widespread and insidious consequences may necessarily have to focus on a specific local manifestation of the hyperobject, or can only motion toward a particular assemblage's visible effects, these specific literary and visual narratives can serve as pinpoints on a map that allow the viewer to imagine the vastness and activity of the problem. At the same time, seeing plastic as an actant capable of forming assemblages with other entities whose emergent capabilities far exceed our expectations may, in fact, allow us to develop an ethics that thinks beyond anthropocentric desires and short-term consequences. The Jordans' work in particular asks that we both see ourselves in the plastic and recognise it as a separate and distinct

actant. Like the robot that gains consciousness and slips out of control, plastic acts in ways we do not intend, anticipate, or understand. Plastic may be unnatural, and it may be useful to see it as an extension of the human, but to fully understand the gravity of this situation, we need also to see plastic as an actant in its own right, an entity that exists beyond the human.

Notes

¹ I use the term *text* in its broad sense; the work examined here comes from marine biology, environmental studies, popular journalism and news coverage, literature, Ted Talks, and photography.

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