

Greta Mundt

Listening for the Song

I sit in the middle of a shamrock green field, the itchy grass tickling my calves, overlooking the cold ocean. The sound of waves enters and leaves my ears as the tide comes up on the shore and sloshes as it retreats. The rustle of leaves come and go, like the whispering of trees to one another. The trees continue their hushed gossip; their conversations hold my interest, perhaps because the trees speak a language so different from my own.. As I listen, I hear the conversations of so many other things: the pleasantries of the lonely cloud to the expansive clear sky, the chortles of the shore to the sea, the jokings of the birds to the sole butterfly, flitting above the grass. Each conversation is different, but the differences slip through the cracks in my mind as I try to place them. Even though I don't know their languages, I understand what they're saying.

Suddenly, the area seems a much calmer place than it did mere seconds ago. It's as if the shore and the sea, which had been in silent disagreement before, suddenly ceased their arguments, drawing away the tension that had flowed through them. The conversations that I had been eavesdropping on mere moments ago are gone and replaced by something so different. Rather than sounding busy and chaotic like a train station during rush hour, the sounds work together, forming a song. It seems quiet now, and I only hear the sound of the waves hitting the rocks creating a beautiful melody with the crickets. The song swells into fortissimo, and the trees seem to dance with the music, the rustling of their leaves adding a new harmony, a flawless vibrato. The birds chime in as well, creating a high descant to the melody. The harmonies ebb into dissonance and flow into unison effortlessly. Gradually, a diminuendo takes hold, and the harmonies fade out until all that is left is the sound of waves.

Sometimes we forget that the ocean remains something to be listened to. The world around us carries on its continual conversations: bickering, playing, laughing, loving. Some of the time, though, that conversation is in song. I grew up listening to the landscapes, to their meanderings, tangents, exchanges, and to their songs. My landscapes were different, full of lakes, rivers, forests, not a drop of saltwater in sight, the melodies of the trees singing softly into my ears. They sing different songs than the ocean that I've come to know in Maine, absent of the constant ostinato of the waves. They have different conversations with each other, telling their own stories.

Having grown up in Minnesota, freshwater had been what I had known, what I was familiar with. The handful of times I had visited the ocean, it had been as fleeting as the tide that tickled my toes; I would stand on the shore, smelling the salt. Standing, waiting on the sand for a breath, maybe two, until my two big toes were skimmed by the water, next my whole feet. I would wiggle my toes and wonder if maybe a fish would nibble on them if I stood still long enough, but before I knew it, the water had receded. That was the ocean to me, something I would emerge myself in for the briefest amount of time, as soon as it had come, I was gone, back to the lakes of Minnesota. Just as my feet would quickly dry off, and forget of the water that had submerged them, my connection to the ocean would dry quickly as well, with only lingering grains of sand. Now, having immersed myself at Coastal Studies for Girls in Maine, a science and leadership school, I've spent four months learning about the ocean and listening to its song. Now, I've been intentionally creating a connection to my new surroundings. Now, I'm irreversibly tied to the sea.

The songs of the ocean continue to change as humanity continues to rewrite the tune. Pollution disrupts the seamless song, plummeting the piece into discord. Plastic pollution has

plagued our oceans since its invention in 1907 and its popularization in the 1930s-40s (History of Plastic). Recent records state that 245 million tons of plastic are being used annually, and the number keeps growing (Andrady 1996). Plastics are forever, never decomposing, so once they are in the environment they are there to stay. Eighty percent of debris found in the oceans is land based and is often plastic (The Problem of Marine Plastic Pollution). Our society has become increasingly dependent on plastic, and the discarded plastic is adding up.

Plastics pose countless threats to the environment. More than 300 marine species are affected by our use and improper disposal of plastics (Ocean Plastics Pollution). Plastic has seeped into all aspects of our oceans, from the shore to open water. In open water there are areas like the North Pacific Gyre where plastic has been carried by currents and converged in one area (Ocean Plastics Pollution). There are five locations like this, covering 40% of our oceans (Ocean Plastics Pollution). Animals, including fish, sea turtles, and seabirds ingest plastic, having mistaken it for food and are unable to digest it (Ocean Plastics Pollution). Marine mammals get tangled within plastic debris and ingest it, including the endangered Hawaiian monk seals, which is severely detrimental to the conservation efforts of the species (Ocean Plastics Pollution). As we try to save endangered marine species from other outside forces we also have to remember that our plastic is killing them.

This fall, I participated in the International Coastal Cleanup on Upper Flag Island, a small, 31-acre island off the coast of Maine. I had never done anything like it before, and I was in no way prepared for the amount of plastics and other forms of trash that we found on the island: over 100 pounds of garbage, at least half of it recyclable. Plastic bottles, foam pieces, ten feet of rope, even a discarded Happy Meal Toy. I knew of the plastic pollution problem, but I did

not think that it would be so apparent in a more remote area of the New England Coast like Maine, an area that is not circulated by the ocean gyres.

I was pacing down the beach that day and a glint of green caught my eye. I ran to see what it was and saw that it was the hollow, green bulb that had once been a living green sea urchin. I scooped it up in my right hand carefully and continued to examine it. It was covered in small bumps, forming a geometric pattern of sorts, where the spines had been. It was a pea soup green, washed clean by the salty ocean water. I had seen these remnants of these creatures before, but had never discovered a whole one myself. Standing there, I could hear the ocean singing its melodic rhythm, causing me to pause briefly, quietly listening. I traipsed through the dry sand as it begged to be let into my sandals, put the sea urchin into my backpack and left it there, trusting that it would be safe for the day. When I returned I found that it had been crushed, and I was filled with disappointment. With my now barefoot toes digging into the soft sand, I stared at the broken fragments in my hands and slowly began to crush them between my fingers. I let the small particles slip through onto the sand where they too would become sand, returning to its home. I listened, and what caught my attention was how different the melody sounded now. Something had changed. That day was when I realized that we are rewriting the song.

Just as I was unaware of the extent of plastic pollution in Maine, I was also unaware of the effects of microplastics on our environment. We are largely aware of the visible forms of plastic pollution in our oceans, like plastic bags and bottles, but we are less aware of what we can't see. Microplastics, which take the form of plastic fibers or fragments less than five millimeters are found everywhere, from your facial cleanser to synthetic fleeces to the environment (Cole 2588). Microplastics can be manufactured, like the microbeads found in facial cleansers and toothpastes, but are also be indirect, formed by the breakdown of larger

plastic objects (Cole 2588). Since plastic never truly decomposes, the particles are degraded by sun and oxygen exposure and form microplastics (Cole 2588). Microplastics are also released by washing synthetic fabric, a dominant form of clothing, including most athletic clothes and synthetic fleeces. These are washed and the wastewater is treated at wastewater treatment plants, where they do not filter out the microplastics due to their small size, and the water is released to the nearest watershed, along with the microplastics. A study that examined 18 beaches on six different continents found that each beach had microplastics and 80% of the microplastics found were polyester or acrylic fleeces made of polyester fibers (Moretto). The beaches by more populated areas had more microplastics and there were 250% more microplastics found at beaches near sewage disposal sites (Browne).

Microplastics don't seem inherently harmful to the environment, being such miniscule fragments, but just as visible plastics are ingested by large animals, microplastics are ingested by organisms at the bottom of the food chain such as filter feeders like blue mussels and zooplankton (Cole 2588). When zooplankton, which comprise the bottom rung of the food chain, ingest microplastics, microplastics can travel through the food chain and affect larger marine creatures (Moretto). Microplastics can carry dangerous chemicals like flame retardants and polychlorinated biphenyl; these chemicals bond to the plastics, which can then suppress the immune system, cause cancers, and cause endocrine disruption (Moretto). Microplastics cause dangers to the whole of our oceans and to people, and it is critical to begin reducing our human impact.

This fall I conducted a research project about microplastics in a group with two other girls. We wanted to examine what impact washing clothes, including synthetics, was having on the environment and how we could limit this impact. In our project, we tested if the temperature

that clothes were washed with impacted the amount of microplastics being produced, and if we could visually compare these microplastics to microplastics we found in the ocean. Although we had a limited sample size, we found a correlation between temperature and microplastic abundance, with cold water containing the most microplastics and hot water containing the least. We also estimated that our average load of laundry, consisting of both synthetic and natural materials, washed on cold yielded around 1,366,533 microplastics per load. We think that the microplastics from synthetic clothing being washed are making their way into ocean waters because the fibers that we found in the ocean were identical to the polyester fibers from the waste water. Although we want to continue testing in the future to produce more conclusive results, the statistic that 250% more microplastics are found near sewage disposal sites speaks for itself; microplastics from our clothing have a huge impact (Moretto).

We know the impacts of our plastic use. We know the stories of birds feeding their young plastic, their stomachs being filled with no nutritional value. We know the stories of seals getting entangled and unable to break free. We know the stories of the endless amounts of microplastics floating in our oceans, haunting the bottom of the food chain. Yet these stories don't resonate with us if we have not developed connections to the land; to care for the species in a place we must care about a place itself first. Barry Lopez describes sense of place as "a place in which we know exactly who we are. The place from which we speak our deepest beliefs" (Lopez 39). Sense of place is the most integral part of inspiring people to care for our oceans; without sense of place we do not feel that it's necessary to save a piece of land or oceans. Without emotional ties to our environment we cannot understand why we need to save it.

So often we dip our toes into the ocean, letting them skid above the surface, watching the ripples, admiring the beauty, but never submerging ourselves, never going deeper. Sometimes we

forget that the oceans remain something to listen to. We're too busy listening to other things that we don't hear the constant noise of our earth, the laughing, the bickering, the whispering, the sighing. Sometimes, if we're lucky, we can even hear a song. Now, the oceans are singing a song for help, and we're the only ones who can listen.

Works Cited

Andrady, Anthony L. "Microplastics in the marine environment." *Marine Pollution Bulletin* 62.8 (2011): 1596-1605.

Browne, Mark. "Microplastics from Washing Machine Wastewater Are Polluting Beaches."

Science for Environmental Policy: DG Environment News Alert Service (n.d.): n. pag.
Ec.europa.eu. 9 Feb. 2012. Web. 29 Oct. 2014.

Cole, Matthew, et al. "Microplastics as contaminants in the marine environment: a review."
Marine Pollution Bulletin 62.12 (2011): 2588-2597.

"History of Plastics." *SPI*. N.p., n.d. Web. 03 Dec. 2014.

Lopez, Barry Holstun. *The Rediscovery of North America*. Lexington, KY: U of Kentucky, 1990.
Print.

Moretto, Mario. "Is Your Jacket Contributing to Pollution? Blue Hill Group Studying
Microplastics' Effect on Ocean." *Bangor Daily News RSS*. Bangor Daily News, 13 July
2012. Web. 02 Nov. 2014.

Moretto, Mario. "Is Your Jacket Contributing to Pollution? Blue Hill Group Studying
Microplastics' Effect on Ocean." *Bangor Daily News RSS*. Bangor Daily News, 13 July
2012. Web. 02 Nov. 2014.

"The Problem of Marine Plastic Pollution | Clean Water Action." *Cleanwater.org*. N.p., n.d. Web.
01 Dec. 2014.

Greta Mundt

From the Bow Seat Reflection

After spending time in Freeport, Maine, at Coastal Studies for Girls, an immersive semester school for 10th grade girls, a very different environment from my native St. Paul, Minnesota, I gained a whole new perspective on the environmental challenges that our world is facing, especially focusing on the challenges our oceans are facing. This was something entirely new for me, having grown up in a landlocked state and never having the ability to truly examine human impacts on our shore. I was thrust into an environment that I knew relatively little about, and because of that, I strove to embrace the differences and learn as much as I could, shocked at what I found regarding plastic pollution.

Music however, has been something that I've always understood. Growing up as an avid singer and flute player, and a reluctant piano player, music has created an outlet in my life to make things, and when sitting down to write my prose piece, I thought back to other pieces, both prose and poetry, that I had written throughout the semester. The unifying factor was comparing this relatively new landscape I was in, to music, a constant in my life. Merging my research on microplastics, personal experience, and a constant metaphor of music throughout the piece, I think I've encapsulated my experience with plastic pollution, and how I want it to change.