

Currents of Plastic Awareness

An anthropological study of a NGOs work to create knowledge and awareness of plastic pollution in the ocean.



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Reading guide

Since most of my informants were Danish, most of the field notes and citations are translated from Danish to English. Interview transcriptions, field notes, and empirical material are formatted in italic. Photographs are taken by the author, unless stated otherwise.

Photos on the front page:

- *The expedition ship Christianshavn S/Y (Photo by Plastic Change)*
- *The shoreline at Puerto Chino, San Cristobal, the Galápagos Islands*
- *Plastic pieces in the sand (Puerto Chino)*

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PROLOGUE

A meeting with plastic pollution

The path opens up. In front of us lies an absolutely beautiful beach. White sand, azure ocean, and black lava stones surrounded by green vegetation. It is beautiful. And the beauty combined with a gentle smell of ocean just makes it even better. I cannot stop myself from being fascinated by this magnificent landscape. We are on the beach Puerto Chino, on the eastern side of the Galápagos Islands. We are surrounded by sea lions that lie about at the beach, marine iguanas that sit perfectly still on the rocks, and blue-footed boobies who sit on the lava stones and enjoy the breeze.

After half an hour on the beach, we return to the cars. Just before we reach the path that leads us to the parking area, Sebastian sits down. Sebastian has been the skipper of Plastic Change's expedition ship Christianshavn S/Y for the expedition from Colombia to the Galápagos Islands, and has since the foundation of Plastic Change volunteered on and off full-time for the organization. He digs around in the sand with his hands. I get closer and can see small plastic pieces lying everywhere in the sand. Blue, white, yellow, and green in different sizes. They lie everywhere.

Sebastian is clearly affected by the amounts of plastic and microplastic that he can dig up from the sand. "*It is just like Bermuda,*" he says with anxiety in his voice. "*Plastic pieces were also all over the beaches at Bermuda. When you just started to dig around. It is unbelievable. This, you cannot just remove.*" I sit down next to Sebastian and start digging around with my hands. The others leave. "*We need to take a video of this,*" Sebastian says. I have my good camera with me, and we place ourselves in the lava stones. With the white sand and the azure ocean in his bag, Sebastian starts talking while I press record on my camera, trying my best to hold it still while he talks:

I am sitting here in one of the most pristine environments in the world. Galapagos Island. San Cristobal. And I am disgusted by the amounts of plastic that we find on this eastern shore. This is plastic that doesn't originate at Galapagos. You can see how small the pieces are. It is something that may have travelled all the way from South America and has been mechanically integrated into smaller and smaller pieces. If you consider the efforts they have done at Galápagos to conserve this pristine environment... and now we are facing a threat that doesn't even originate from here. That is why Plastic Change is so keen to collect efforts on a global scale: To gather scientist and politicians, NGOs and the industry to come up with solutions to the global problem of plastic pollution. Thank you very much for supporting our work. This is just really something that we have to do something about.

Sebastian is clearly moved and with each shoot he tries to make his argument even clearer. After a few shots, we walk back to the cars. Sebastian expresses how we as humans have become accustomed to huge amounts of plastic. We do not even notice it anymore. Microplastic on the beach, as we just saw, has just become part of the beach like the small shells. Our eyes do not distinguish it any longer.

I am surprised by the amounts of plastic that we have already found here on the Galápagos Islands, and that very little attention has been paid to the archipelago in relation to plastic pollution. We move on to the idea that most focus has properly been on the islands within the five major ocean gyres, which is created by the circulating ocean currents. These places the amount of plastic in the water is increased. In the meantime, other places around the world have been forgotten.

Walking back from the beach, we discussed a lot of interesting perspectives concerning plastic pollution and the role Plastic Change plays in relation to the industry, politicians, NGOs, and the scientific environment. Sebastian argues that Plastic Change has the quality of pushing many different buttons at one time. They are not caught in a position where they can only speak with one voice and to one audience. They do not need to compromise their actions. They can talk to the public through different medias, talk with the industry and get them engaged in finding solutions and talk to politicians, which can lead to new laws and restrictions.

* * *

That day gave me new insight. I understood how big the threat of plastic pollution is when so many pieces had found their way to the Galápagos Islands, a place that had not been the focus of attention. I had the feeling that the work of Plastic Change was far from insignificant and that their work to create awareness in the general population, to change how we use and dispose of plastic, and to get politicians and the plastic industry to take responsibility was indeed making a difference.

INTRODUCTION

The ocean covers two thirds of our planet, and at this very moment humans are affecting it in ways that will change the ocean forever. Humans invented plastic in the early 20th century, and since the Second World War plastic production has seen a massive expansion. Today, plastic is an inseparable part of peoples' lives. Humans have become "Plastic People", and plastic is today found everywhere around the planet (Freinkel 2011, 10). During the last few years, there has been an increasing attention towards plastic pollution and marine debris. There is a growing knowledge and interest in plastic pollution, not only scientifically but also in the public. Every month, new scientific articles and reports are being published, and the literature today embraces data collected around most of the globe dealing with sources of plastic pollution (Jambeck et al. 2015), amounts of plastic in the ocean (Eriksen et al. 2014), effects of plastic in the environment (Lassen et al. 2014), and the economic dimension (PlasticEurope 2015). However, at the moment, very little research has been done within the humanities and anthropology on human relations to plastic.¹ Since plastic pollution in the ocean in the last few years is just becoming worse (WEF 2015), it is highly relevant to pay attention to how people are made aware of this growing problem.

Learning about plastic pollution through the media, I heard about the organization Plastic Change that was based in Copenhagen. It was founded in April 2014 and had in a short time span created a lot of attention towards plastic pollution in the ocean. Plastic Change had placed plastic pollution on the agenda with the population, politicians, and the plastic industry in Denmark. In October 2015, when they applied for crew and volunteers for their next part of *Expedition Plastic*, I was hooked. I decided to do my fieldwork with Plastic Change, particularly with a focus on data production and how knowledge about plastic pollution was produced, understood, and communicated to the public. However, my romanticized idea about how Plastic Change contributed with huge amounts of data to a global

¹ To my knowledge, Thom Van Dooren is, at the moment, through his analysis of the Laysan Albatross of Midway, the only anthropologist who has dealt with plastic pollution in the ocean (Van Dooren 2014).

dataset, in which the development of plastic pollution was estimated according to quantity and spread (Plastic Change 2016d), was ruined shortly after arrival in Colombia. They were producing knowledge, but a different kind of knowledge than I had expected to meet. The part of the expedition that I attended was not a part where Plastic Change wanted scientific valuable samples: This part was more about getting the ship closer to the North Pacific gyre, where they planned to do more profound research.

I thus started to focus on more than just “data” and came to see knowledge production as the articulation of a range of practices and processes, such as sampling, processes of witnessing, and storytelling and storying. It was through these processes that Plastic Change was creating awareness about plastic pollution in the Danish population. They took part in the creation of an environmental problem² and not just in the making of data. This focus morphed into the following problem statement:

How is plastic pollution made into and spread as a meaningful and significant environmental problem? And how is knowledge about plastic pollution in the ocean produced and communicated to the general Danish population by Plastic Change?

These questions do not imply that environmental problems are imagined. Environmental problems are processes that have negative effects on the biophysical environment; however, as Emma Jakku et al. (2009) suggest, then the “recognition of an environmental problem must be given to the social, cultural, political and historical processes involved in the construction of such problems” (ibid., 25–26). By asking how plastic pollution is made into and spread as an environmental problem, I turn my focus towards the social processes instead of the biophysical processes.

Since the beginning of anthropology as a discipline, the relationship between culture and nature has been widely discussed. Lately, it has been taken to another level, with the introduction of *The Anthropocene* – a concept that is used to

² I have chosen to refer to plastic pollution as an environmental problem and not an environmental issue throughout the thesis. This is done since that was how my informants used and referred to the consequences of plastic pollution.

grasp the current period in Earth's history where humans have become a geological force (Steffen et al. 2011). The Anthropocene captures plastic pollution as its root, since plastic is just one of the things humans have invented that will be present in the geological records in the future (Zalasiewicz and Waters 2016). The Anthropocene as a concept and a frame for thinking forces us to a new awareness of our surrounding environment and makes us raise new questions about humans' relation to the environment and how we believe future generations should relate to it.

My analytical frame in this thesis is inspired by science, technology and society studies, also known as STS studies, which are based on a social constructivist approach focusing on how relations between humans, things, knowledge, technologies, and organizations come together. What is interesting for STS scholars is to uncover how relations assemble or do not (Law 2008, 2, Jensen et al. 2008). With a focus on how different kinds of relations come together in the construction of an environmental problem, the STS approach directs attention to how knowledge and awareness about plastic pollution are produced and shaped. Inspired by Bruno Latour (1986; 1993; 2014), I focus on the *processes* and *practices* through which plastic pollution is becoming an environmental problem in Denmark.

In the first chapter, I will introduce the problem, method, and the analytical framework that has shaped this thesis. In answering my problem statement, I will in chapter 2 show how fundraising and practical issues, sampling, and witnessing are practices that create knowledge and are part of the construction of plastic pollution as an environmental problem. Subsequently, I will show in chapter 3 how Plastic Change draws on verbal and visual images from international organizations and how discourse and storytelling are woven together in Plastic Changes communication of the problem and in the making of plastic pollution as a meaningful and significant environmental problem. These two chapters serve as the main analysis. Chapter 4 is as a shorter chapter that analyzes and directs attention to the challenges of "care" in an environmental context, exploring how caring is not a simple practice. This is done with different examples to highlight the complexity of caring, since Plastic Change ultimately wishes to raise and spread awareness and to make people, politicians and the industry care and change ac-

tions. Inspired by marine anthropologist Stefan Helmreich (2009; 2011), I use currents as an element for thinking and for theorizing and argue that environmental knowledge and awareness is spreading similar to how plastics are being spread with ocean currents.

My aim in this thesis is to show how plastics and microplastic in the ocean became and are still becoming an environmental problem within the Danish society. Based on a fieldwork with Plastic Change, this thesis is a snapshot into their world, more precisely into the world of Expedition Plastic. What is central is how plastic pollution has become a matter of concern in Denmark – not all over the world at the same time, but constructed in a particular place in relation to a particular public. By looking at the construction of plastic pollution as an environmental problem, I do not argue the plastic pollution does not exist in itself. Plastic pollution is *made* into an environmental problem, but it is not *made up*.³

³ When the second version of *Laboratory Life* was published in 1986 (the first was published in 1979), “social” was dropped from the subtitle (Roepstorff 1999, 145). Although Latour has been seen as one of the most prominent scholars of social constructivism, he has through his scholarship moved from a strong attention to “construction” to a softer version that is closer to “made” (Latour 2005).

CHAPTER 1

Problem, Method, and Analytical Framework

Plastic pollution – The phenomenon

Every day, nearly everyone, everywhere around the world comes into contact with plastics. However, only a single generation ago, it was not like that. In 1940, plastic production and consumption was almost zero, but during the Second World War, polymer chemistry was taken from the lab and into the real world. Since then, global plastic production has surged; from 15 million tons in 1964 to 311 million tons in 2014. In the space of a single generation, we have become plastic people, and the lives of most people today are inseparably linked with plastics (WEF 2016, 7–8; Freinkel 2011, 5–11; Tarpgaard 2015).

Plastic is a general term that includes a range of different polymers, both synthetic and semisynthetic. These polymers are produced from oil, in a process where monomers are chained together to longer polymer chains. Polymer chains are built to last, which in many respects makes plastic a wonderful material. Today, plastic is used in most sectors of our society: from building and construction, to agriculture, electronics, transportation, clothes, household appliances, and packaging. A rapport from World Economic Forum (WEF) in January 2016 stated that plastic packaging currently represents 26% of the total volume of plastics used. Packaging has great functional benefits but also an inherent design failure, since it can only be used once or twice but is made of a material that is designed to last for centuries. Plastic is designed to last forever and is not biodegradable. This means that humans could disappear from the earth tomorrow but that most of the plastics we have made will last for centuries (WEF 2016, 7–8; Freinkel 2011, Knudsen 2015, PlasticsEurope 2015).

In the beginning of the 1970s, the first report of plastic debris in the ocean appeared, and between 1985 and 1988 the North Pacific, Bearing Sea, and Sea of Japan were studied for the distribution and characteristics of plastics (Day et al.

1990). In 1997, Captain Charles Moore discovered what was later known as the Great Pacific Garbage Patch. At the time, Moore was an activist and yachting captain, and had established Algalita Marine Research Foundation in 1994 to help restore coastal waters. The story of the patch created, at the time, enormous media coverage, growing in size and frame by each media describing it. The Great Pacific Garbage Patch is thus not an enormous island of trash, as portrayed in the media, but is not even visible by satellites, since it comprises mostly of microplastic. In his memoir, *Plastic Ocean* Moore (2011), writes:

It was and is a thin plastic soup, a soup lightly seasoned with plastic flakes, bulked out here and there with “dumplings”: buoys, net clumps, floats, crates, and other macro debris. I was not a latter-day Columbus discovering a plastic continent” (Moore and Phillips 2011, 4).

Moore and the story of The Great Pacific Garbage Patch are thus today known around most of the world as the man and the story that started the fight for clean oceans.⁴

Today, three quarters of all marine debris are plastics, and 80% is estimated to originate from land-based sources. The report from WEF stated that eight million tons of plastics are leaked into the ocean every year. This corresponds to one truck per minute (Jambeck et al. 2015, 768; WEF 2016, 14). The main statement of the report, which subsequently created great media coverage in Denmark, was that “without significant action, there may be more plastic than fish in the ocean, by weight, by 2015” (WEF 2016, 14). Reports from the International Union for Conservation of Nature (IUCN), WEF, and the Danish Environmental Protection Agency all show that plastics released into the environment will remain there for hundreds of years. Via wind-driven ocean surface currents, plastics are transported great distances. Different models and samples all show how ocean currents and winds accumulate debris in five oceanic zones called gyres (Photo 1) (Jambeck et al. 2015, 768; Knudsen 2015, 7–9; Thevenon et al. 2014, 9; Lassen et al. 2015).

⁴http://www.slate.com/articles/health_and_science/the_next_20/2016/09/the_great_pacific_garbage_patch_was_the_myth_we_needed_to_save_our_oceans.html (9.12.2016)

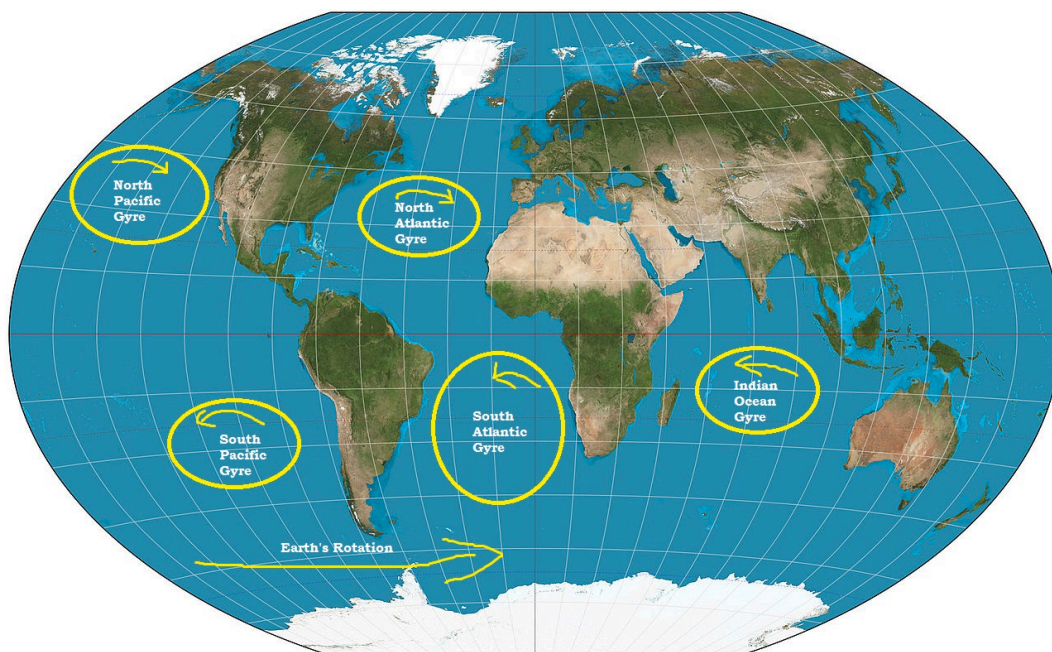


Photo 1 – The 5 major ocean currents (<http://www.orma.com/ocean-gyres/facts/>) (9.12.2016)

This does not mean that the gyres are the only places where plastic can be found. Plastics in the marine environment occur on coastlines, in Arctic sea ice, at the sea surface, and on the sea floor. It is of increasing concern because of its persistence and the effects it has on wildlife, the oceans, and potentially humans (Jambeck et al. 2015, 768).

There are many different aspects of marine plastic pollution that researchers find alarming, and even more aspects that have yet to be investigated. Ecological impacts, such as specific entanglements between animals and plastic, ingestion of plastic pieces and microplastic, plastic serving as a ship for invasion species transport, and the transport of chemical toxins around the environment are just some of the issues that researchers currently find alarming (Gregory 2009 in Eriksen et al. 2014, 2; Thompson et al. 2009 in Thevenon et al. 2014, 12).

In 2014, 5GYRES Institute,⁵ one of the most recognized organizations working with plastic pollution worldwide, convened eight scientists to publish the first global estimate of plastic pollution in the oceans. The report states the total

⁵ 5GYRES was founded in 2009 in Los Angeles. Plastic Changes' work is highly inspired by them, and they hope to work more closely in the future.

number of plastic particles to be more than five trillion, with a weight over 250,000 tons afloat at sea (Moore and Philips 2012; Eriksen et al. 2014). One of the big problems, as just mentioned and as stated in the report by founder of 5GYRES Marcus Eriksen, is that plastic does not biodegrade.⁶ Instead, larger plastic products, through photodegradation and other weathering processes, fragment and degrade into smaller and smaller pieces: microplastics (between 1 and 5 mm) and eventually nanoplastics. What 5GYRES, Plastic Change, and researchers find alarming about microplastics is that they are mostly invisible to the naked eye, both at sea and on beaches where it is mixed into sediments (Eriksen et al. 2014, 2; Knudsen 2015, 10).

As described, plastic is in every corner of our lives. But how do we grasp and understand the way that plastic has come to take part in both human and nonhuman lives? I will explore this by introducing the term *alien*.

Plastic as a component in alien forms of life

During a dinner, Sebastian expressed how he saw plastic as an alien threat becoming normal. He explained it by referring to our day at the beach, as described in the prologue. Microplastic was spread everywhere on the beach, but we did not notice it. We had already become accustomed to the small pieces lying together with small shells. Journalist Susan Freinkel (2010) also argues in her book *Plastic: A Toxic Love Story* how plastic remains essentially alien. One way to explain this alienness of plastic is, according to Freinkel, because of its preternatural endurance (Freinkel 2010, 9).

The figure of the alien materializes, according to Helmreich, when uncertainty overtakes scientific confidence. Helmreich uses the term alien to explain what he calls *alien ocean*: a way of diagnosing a scientific, social, and cultural idea and imagination about the sea (Helmreich 2009, Moorings). In Helmreich's use of the word, the alien is materialized in microbes, organisms that are extremely im-

⁶ In 2016, a Japanese research team discovered a bacteria that seems to be able to biodegrade the plastic type PET (Shosuke Yoshida et al. 2016).

portant in the biochemistry of our world. The materialization happens when we have to fit newly described *life forms* into existing classifications. Plastic pollution cannot in itself be seen as a life form, but through its different entanglements with different organisms at all levels of the food chain, plastic has come to take part in different *forms of life*. Helmreich argues: “Aliens are life forms whose place in our forms of life is yet to be determined” (Helmreich 2009,16-17). Plastic has, by its preternatural endurance, managed to sneak itself into every corner of human and non-human lives. Basic categories are no longer enough (Tsing 2014, 2) to describe the way in which plastics have entangled both human and non-human lives. Therefore, I find the concept of the alien useful for viewing plastic pollution with, since it grasps the mysteriousness and uncertainty which lie in plastic pollution, due to the many unknown effects of plastic and the speed with which it has spread.

That plastic pollution was a problem and a threat that needed to be addressed in Danish society was what made a small number of people found Plastic Change.

Plastic Change and the expedition ship Christianshavn S/Y

In 2014, the international organization Plastic Change, based in Copenhagen, was founded with the following mission:

Plastic Change’s mission is to work with documentation, information, education and solutions that will raise awareness of plastic pollution in the general population, the industry and the political system. We prepare scientific documentation in the form of research data, among other things on our expeditions to the world’s oceans. Our ambitions are high, for the challenge is great. (Plastic Change 2016a)

The founder of the organization, Tom, is a former activist from Greenpeace Denmark and an educated biologist. Inspired by talks with his own children, he realized that plastic pollution was indeed a problem that his generation had created, but one that future generations, his own children included, would take over.

This human-centered focus is very clear in the vision for the organization, which states that:

Plastic Change strongly believes that human beings are entitled to live in an environment free of plastic pollution. This means that future generations should be able to continue living off marine resources and eat plastic-free fish and shellfish, for instance, and enjoy living in a nature that is not polluted by plastic waste. (Plastic Change 2016a)

The first project that Plastic Change launched after their foundation was Expedition Plastic. Many of the people whom took part in the founding annual general meeting were sailors. Tom was together with Carl, a later project leader and captain of the expedition ship, part of a boat group, and with a history in Greenpeace as campaigners they were raised with the importance of “being at the spot”; of “bearing witness”. The boat group own the sailing ship Christianshavn S/Y, a 54-foot steel sailing ship from 1953, and shortly after the foundation of Plastic Change, they borrowed the ship and started the expedition. Carl explained in an interview how he saw the expedition as the obvious starting project for the organization. They needed to have a mandate to speak about plastic pollution. Having an expedition ship sailing from Denmark to Hawaii and Midway, and through two of the worlds gyres, could give them that mandate – and if they could show the problem, then they would be heard. With two main pillars, the sampling of microplastic and creating awareness of plastic pollution in the ocean, the expedition started.

Only two years after their founding, Plastic Change has achieved much more than they could have hoped for. They have a range of volunteers and have larger and smaller collaborators, both national and international. In 2015, they had more than 100 mentions in TV newspapers and other media (Plastic Change 2016b), and with the publishing of the report “The New Plastics Economy – Rethink the future of plastics” by WEF in January 2016, Plastic Change have had even more media coverage. According to Tom, they have gained a unique position within the industry, politicians, and media in Denmark: an expert position, which means that whenever the media and politicians need knowledge or perspectives about plastic pollution, they contact Plastic Change. In their annual report

from 2015, they state that in 2015 they have managed to reach politicians, consumers, scientists, and the media, both national and international. They further state that they have been the primary driver of awareness and change in Denmark (Plastic Change 2016b). In only two years, Plastic Change has come a long way, and Expedition Plastic has played a key role in that development and success.

The processes and practices that have made the above success possible is what will be the object of research in this thesis, because how have they managed to do all this in such a short period of time? This will be analyzed and discussed throughout this thesis with Expedition Plastic as the main case.

Methodology

The data that I present throughout this thesis is based on fieldwork in the spring 2016 together with ongoing attention to plastic pollution and Plastic Change in the media and on social media sites.

My fieldwork took place in Denmark, Colombia, Panama, in the Pacific, on the Galápagos Islands, and in Los Angeles. My fieldwork started in December 2015, when I was accepted and chosen as a volunteer for Plastic Change, on board their expedition ship Christianshavn S/Y on an expedition from Colombia to Los Angeles. In total, two months of my fieldwork took place on Christianshavn S/Y, and sailing and being on the ship was in the beginning my primary field. My ethnographic exploration of the field thus lead me away from the expedition ship and back to the organization in Denmark, following the connections that were presented to me in the field (Marcus 1995). In Denmark, I participated among other things, in a committee meeting, a conference, and different meetings.

The empirical data presented throughout the thesis is mainly based on participant observation, recorded semi-structured interviews, and informal talks with employees and volunteers at Plastic Change. Pictures, videos, and posts on social media sites serve as “found” data (Worth 1980 in O’Reilly 2012, 164), which is produced by the organization, volunteers, and other informants. These materials have also played an important part in my understanding of the field and will be analyzed together with field observation and interviews throughout the thesis. Es-

pecially in chapter 3 where I analyze the spreading and communication of Plastic Change it has been central to use data from social media.

In the following section, I will describe more about my fieldwork, my research methods, anthropological perspectives on these, and ethical considerations.

Research methods – Anthropological voyages

In *Anthropology as Cultural Critique: An Experimental Moment in the Human Sciences*, George Marcus and Michael Fisher (1986) raise a critique towards place-bounded ethnography. Professional ethnography and anthropological fieldwork had long been based on intensive dwelling, and in order to capture transnational political, economic, and cultural forces, new forms of multi-local ethnography were needed (Marcus and Fischer 1986, 94–95). This movement away from studying a single-site location to multiple sites of observation and participation led to what Marcus terms *multi-sited ethnography* that “define their object of study through several different modes or techniques” (Marcus 1995, 106), such as the tracing of a complex cultural phenomenon within different settings.

Although my fieldwork has not been completely multi-sited, since I have not traced or tracked plastic pollution in different spheres, there are elements of multi-sited ethnography which were an inspiration for my fieldwork, and which I incorporated into my research. An element that was central was that the context of my research was not attributable to more loaded forces, but that it instead was of my own and my informants’ making (Marcus 1998, 121). Innovative forms of ethnography were needed in order to truly understand how knowledge about plastic pollution in the ocean was produced and communicated to the general population, and how plastic pollution was made into a significant environmental problem in Denmark.

Instead of terming my fieldwork multi-sited, I will argue that a voyage at sea and networks of sites together create my field of research. Inspired by historian James Clifford (1997), who also took part in the methodological discussion in the nineties, I see my fieldwork as a set of travel encounters. In his book *Routes* Clifford argues that fieldwork is less a matter of localized dwelling, instead, movement is central, and seeing fieldwork as travel highlight that nothing is ever static (Clifford

1997). This argument I find really interesting to follow. To study how Plastic Change makes plastic pollution a topic of concern through their work, requires the study of connections and the tracing of Plastic Change's work in and through different contexts. For me to do so, a voyage at sea was needed.

Being a volunteer

Starting as a volunteer on Plastic Change's expedition ship allowed me to enter the organization from the bottom. At the interview with the two captains of Christianshavn S/Y, where they were deciding if they wanted me on board, I explained my research project. They found it interesting but also highlighted that there would be a lot of work at sea and that the cause of the organization was of more importance than my research project. Being on Christianshavn S/Y, this meant that most of my days were spent participating rather than just observing. I took part in the same work as the other volunteers, getting the ship ready, shopping for food and supplies, taking my shift when we were sailing, cooking, and helping with the trawl. My role was thereby more of a participant researcher (O'Reilly 2012, 86–115).

On the voyage, I also discovered that the network that had been created through the voyage with Christianshavn was not enough for me to understand the complexity of Plastic Change's work. I also had to do research back in Denmark where it all started. One can ask whether my network had grown too large and if it only created superficial research and not in-depth research. My answer to that question is that exactly by extending my network, I was able to gain important knowledge. Clifford asks rhetorically: "How many sites can be studied intensively before criteria of 'depth' are compromised?" (Clifford 1997, 57) For me, it was not about the number of sites but my voyages at sea, the sites that the expedition brought me to and the sites where I conducted my fieldwork in Denmark all help me understand my field and my informants. Through my anthropological voyage, I felt that I gained intensive depth.

Having volunteered for Plastic Change allowed me to gain a special position among the people who I became acquainted with and those whom became my informants back in Denmark. Just as Plastic Change saw the expedition as a way

of legitimizing their work in Denmark, having volunteered in the expedition also legitimized me as a researcher and gave me the “approved stamp”, which I needed in order to establish rapport (Spradley 1989, 78) with the employees and volunteers with the organization in Denmark. My primary informants are thus the people whom I sailed with.

Ethical considerations

Christianshavn S/Y was a “small” (54 feet) sailing ship, which meant that we were a maximum of nine people on board. Living eight to nine people on a sailing ship makes daily life very close. Even though my research was conducted overtly (O’Reilly 2012, 64), this meant that my informants in the beginning had many worries towards about having an anthropology student around at all times and not being able to “escape” to another place. We were around each other twenty-four hours a day, and the only thing that separated one another were the small curtains in the berths that we could draw when we went to sleep at night. Due to this intimacy, I decided to make all my informants anonymous by name. This was done to ensure a sense of trust between my informants and me, which also had the desired outcome. In relation to anonymity, I discussed with my informants that their anonymities could be compromised in the thesis due to my descriptions of them (AAA 2009). All names of informants throughout the thesis are therefore cover names. The places we visited and the organization is however not anonymous.

In doing anthropological work, I have done my best to follow the guidelines of the American Anthropological Association (AAA 2009) both through my fieldwork and in the writing process.

Analytical Framework

In my attempt to understand how Plastic Change is working, I first started to learn about plastic pollution in the ocean. I examined how plastic behaves at sea, and discovered that due to oceanic currents plastic is transported great distances compared to when it ends up on land, where it’s movement is mainly affected by wind

(Lassen et al. 2015, 29, 66, 72). Plastic thereby behaves very differently in the ocean than it does on land. This made me raise the following question: What do we need to pay attention to when looking at human relations to plastic in the ocean, compared with human relations to plastic on land?

According to Helmreich then, looking at and with ocean as a concept is very different from looking at and with land as a concept. In his perspective, fluid terms have made their entrance in scholars rethinking of the world in an attempt to change the bias that thinking with landscapes has created in our minds and analysis. Watery metaphors such as flow, fluidity, and circulation are being used, and as Helmreich expresses it: “Thinking with watery metaphors has become a prescriptivist enterprise. We should be thinking with water – including oceans” (Helmreich 2011, 137). What Helmreich calls for and discusses in his article “Nature/Culture/Seawater” is that we use water as a theory machine and not just a description, since the ocean is a potent material for the formation of theory. It is thus important to be critical about the way this is done, so that we do not take water as a global, self-evident substance but instead acknowledge that meaning is inscribed in water (ibid.).

In this part of the chapter, I will draw attention to landscape studies and discuss how there is a bias in our thinking that is framing our theoretical framework and the way in which we understand human relations to the ocean. I end by proposing the term *oceanscape* as a way of capturing human relations to our surrounding environment and argue that the concept has a role to play in social science.

Studies of landscape

Studies of landscape are nothing new within anthropology. At the turn of the millennium a paradigm shift against constructivism took place within anthropology, which led to the recognition of places as an essential component for sociocultural theory (Low and Lawrence-Zúñiga 2003, 1). Tim Ingold (2000) is just one of the anthropologists who turned his attention towards place theory and studies of land-

scapes.⁷ He rejects the idea that landscapes and humans are two separated unities and instead argues that “through living in it, the landscape becomes a part of us, just as we are a part of it” (Ingold 2000, 191).

In an attempt to bring anthropology and archaeology together, he thereby argues for a “dwelling perspective”. Ingold contends: “The landscape is thereby constituted as an enduring record of – and testimony to – the lives and works of past generations who have dwelt within it, and in so doing, have left there something of themselves” (ibid.,189). What is interesting about this quotation and his book in general is how Ingold sees paths, tracks, and places as elements that are constituted by dwelling, and thereby form the landscape. What I would like to propose is thus an approach that takes Ingold’s notions even further: By inventing plastic and “distributing” it in the environment, we have created a reminder of human activities in the landscape that are even more powerful than paths and tracks. We have left something of ourselves in the form of plastic. Plastics have already become an enduring record of the lives of humans in the past sixty years (Zalasiewics et al. 2016), and by using the posterior framework of landscapes to think with in our analysis, I will argue that we leave out certain insights. I will try to elaborate on this in the following section.

The two cultural geographers Martin W. Lewis and Kären E. Wigen (1997) argue, in *The Myth of Continents – A Critique of Metageography*, that it is the most basic information in our worldview that is the most problematic. In cultural geography, it is the highest level of our geographical taxonomy: the continents, or even higher and simpler, the East and the West, or First, Second and Third world. Their main argument is that there is a bias in our thinking, a framework that structures our perception and messes up the way that we look at the world. Within our thinking, we divide the world into fundamental units, categories through which we think about the world, and these spatial frameworks direct our focus of thinking and research (Lewis and Wigen 1997, 1–19; Tarpgaard 2015). Many scholars focus on land and landscape, and Ingold’s framework is thereby nothing extraordinary. But as Lewis and Wigen argue, it is a socially constructed “taken-for-granted” framework that structures what we can and cannot say. The solution is first of all to rec-

⁷ See also Keith Basso’s *Wisdom sits in Place* (1996).

ognize that we have this bias in our thinking. Second, we need to both deconstruct and converge these frameworks. Lewis and Wigen argue: “Problem of language are inevitable in such a project; in order to continue talking about the world, we must have the cake of metageography while deconstructing it, too” (Lewis and Wigen 1997,17). The words and language that we use is therefore important if we wish to change the posterior framework of our analysis. This argument falls very much in line with Helmreich’s argument about using water as a theory machine. Inspired by Helmreich, Lewis and Wigen, and my work with plastic pollution in the ocean, I found it necessary to deconstruct and construct notions of scapes.

Oceanscape, currents, and the journey of plastic

Based on recognition of land and landscape as a bias in our thinking, I would like to introduce the term *oceanscape*. Inspired by Lewis and Wigen’s theory of continents, I see the term oceanscape as a way of both deconstructing and converging the framework of landscape. I will start out by exploring why Ingold’s perspectives of dwelling does not work the same way with oceans as it does on land.

In his work *Lines*, Ingold (2007) explores his anthropological perspectives further, still with references to landscape. He argues that places only exist due to their relational paths, which bring movements from elsewhere. Paths are lines of a sort (Ingold 2007, 2). In Ingold’s (2000; 2007) understanding of paths, both in *The Perception of the Environment* and in *Lines*, he sees them as an indication of human dwelling and presence in the landscape, since they connect and constitute places and become a testimony of past generations.

However, our Earth does not only exist of land and soil. Two third of our planet consists of water, and water moves and changes much faster than land (Helmreich 2011, 132). In using land-related metaphors such as landscape and paths to explore and explain humans’ relation to their surrounding environment, Ingold uses land as his theory machine and explains cultural structures in relation to land. If we instead take Helmreich’s notion of water as a theory machine seriously and start thinking with water, then we are able to understand sociality, humans’ relation to their environment, and humans’ relation to non-human agents in completely new ways (Helmreich 2009). The ocean with its currents, constantly

moves water, organisms, animals, and now also plastics around. It changes much faster than land does. Knowing the ocean is therefore different from knowing the land. On land, human and non-human actors have created paths in the landscape, but in the ocean there are no such paths. Instead the ocean has currents, which humans cannot influence in the same way. Ocean currents are continuous and directed movements of ocean water and are both present on the ocean's surface and in its depths. They flow both locally and globally, driven by winds, water density, and tides (NOAA 2016; Lassen et al. 2015, 66).

I would like to illustrate that ocean and land are different and feel different with the following ethnographic account:

After nine days at sea, we have San Cristobal in sight, the first Island that Darwin reached in the Galápagos Islands. We sail by motor, and have done that on/off for the last three days, since there has been no wind. Having land in sight, makes us all reflect and talk more about the relation between land and ocean. Looking at the calm ocean around us, Katrina says: "It is amazing that such a great ocean can be so calm". Sebastian smiles: "There is a reason why it is called the Pacific Ocean". To Sebastian, knowing the ocean is something which he has learnt by experience, and he expresses a clear feeling of knowing different places at sea. "The sea is not just the sea. But places at sea are different, they feel different," he elaborates.

As we see in the field note, Sebastian express in a philosophical way how he sees the ocean. For him the ocean indeed differs from the land, but through his experience as a sailor, he has come to an understanding of the ocean that is more reflected than when he first started to sail at the great seas.

By being different from land, the same analytical framework cannot be used in my point of view. I will argue, that the bias of land in our thinking is a result of our anthropocentric worldview. Humans all over the world live mostly on land and on coastlines, and as a result of our interaction with mostly land and landscape, our cultures have evolved. Within anthropology, we have mainly studied human sociality, and as a result of this, our focus has been on the places where humans have enacted most of their lives – on land (Ingold 2000).

A different framework will produce a different understanding. Therefore, I find it central for my thesis to introduce the term oceanscape and suggest it, not as

a counter to landscape, but as an addition to landscape. The world we live in today moves faster and faster, and places and paths are in rapid change all the time. Humans and non-humans might still dwell in the landscape as they did fifty or a hundred years ago, but using oceanscape as a concept to think with opens our eyes and understanding to a world that today runs much faster. Currents in the oceanscape change fast, transport fast, and change the world faster. It brings the world together in a much faster way than paths in the landscape.

Currents are a watery metaphor that I would like to use throughout this thesis. Currents transport plastics and tie place, people, animals, and organisms together in new ways. To understand how humans, non-humans, and plastic are tied together, we need to use a different vocabulary than a land-based one. Plastic is a thing-in-motion and is moved around with ocean currents and transported greater distances than we could ever imagine. Currents, waves, slipperiness, and elusiveness are all concepts that invite a movement towards oceans. Both as a theory machine and literally.

Anthropology at Sea

As elaborated in the last pages, I have argued that a turn towards the ocean is needed in order to understand the complexities of our world today. Within anthropology and other human sciences, this development is thus slowly happening.

Many of the anthropological journeys in the beginning and the middle of the 20th century began with sea voyages, but very few of them had ethnographic accounts of these voyages and the people living along the coastline. Bronislaw Malinowski and his study of the Trobriand Islands of New Guinea is a good example of such a journey. Maritime anthropology actually dealing with anthropology at sea has thus often been neglected within the discipline, and studies of people's imagination and encounters with the sea have only appeared here and there. These studies have primarily described the lives of fishing people and other people living on the coast. Helmreich argues that for anthropologists such as Malinowski and Claude Lévi-Strauss, seawater was a symbol of a changeable nature in which water functioned as a description rather than a theory machine. "Theory" was

held in abeyance while at sea and set in motion when they hit land. This he aims to change (Helmreich 2009, 18–19; Helmreich 2011, 134).

Helmreich is today the most recognized anthropologist within maritime anthropology, and his research deals with anthropological voyages in microbial seas. In dealing with microbiological life in the deep sea, Helmreich has opened up to a field of analysis that deals with how marine biologists, marine microbiologists, and oceanographers create knowledge; Helmreich has opened a space for anthropologists to be curious about how knowledge travels from experimental data to public knowledge. Furthermore, he has illustrated in his work how scientific “facts” can be means of crafting new visions of the universe and enabling new futures (Helmreich 2009, 18–19; Tarpgaard 2015). These two perspectives have been an inspiration for my fieldwork and this thesis, since I find them highly relevant within my field. The movement of knowledge as it moves from experimental data to public knowledge is also central within the field of plastic pollution, since Plastic Change through the expedition is trying to transfer samples to data and eventually to public knowledge and awareness.

By focusing on plastic pollution in the ocean, especially microplastic, my thesis contributes to a still narrow scholarly direction within anthropology at sea, and by posing oceanscape as an analytical concept I am throughout this thesis trying to overcome the bias of landscape in relation to plastic pollution in the ocean as an anthropological field of research. A framework that is central to draw upon is the Anthropocene, which in recent years has gained a foothold in both natural and human sciences.

The Anthropocene

In 2000, the Dutch Nobel Prize-winning atmospheric chemist Paul Jozef Crutzen and biologist Eugene Stoermer introduced the term Anthropocene to capture the quantitative shift in the relationship between humans and the global environment. According to Crutzen, the term describes a new geological era in Earth’s history, where the unintended consequences of human actions are increasingly dominating the rest of the living world and have done so since the advent of the Industrial

Revolution. The effect of humans on the global environment has escalated, Crutzen argued, and humans will be a major environmental force for many millennia to come (Crutzen and Stoermer 2000; Crutzen 2002). In 2011, Will Steffen, Crutzen, and others proposed three significant areas in which they identified that “humankind has become a global geological force in its own right” (Steffen et al. 2011, 843). Aside from altering carbon cycles, which have been recognized since the nineties, they argued that humans are further altering several other biogeochemical cycles that are fundamental to life on Earth, greatly modifying the terrestrial water cycle and likely driving the sixth extinction⁸ (ibid.).

In the last few years, the term Anthropocene has become widely accepted in the global change research community. However, the question of where to place the golden spike, the geological marker for the beginning of the Anthropocene Era, is still being discussed. The interactions between humans and the environment are nothing new, and preindustrial events such as the extinction of the Pleistocene megafauna and the advent of agriculture are two periods that occasionally have been cited as heralding the beginning of the Anthropocene. What Steffen et al. suggested in their article in 2011 was to put the golden spike at the beginning of the Industrial Revolution in 1800, but they also highlight the Great Acceleration beginning in approximately 1945 as a clear marker of the Anthropocene. Among other things, this period was characterized by increased population growth and the movement from farms and villages to bigger cities (ibid.).

Plastic pollution as the golden spike for the Anthropocene

In august 2016, members of the Working Group on the Anthropocene (WGA), who started their work in 2009, have voted in favor of a preliminary recommendation of formally adopting Anthropocene as an Epoch, stating that there is sufficient evidence, and that the best candidate for a golden spike are the radioactive elements from nuclear bomb testing in the 1950s and 1960s. Geologist Jan

⁸ The fifth mass extinction was the dinosaurs approximately 65 million years ago in which approximately 75% of the species disappeared (Van Dooren 2014, 5–6).

Zalasiewicz, who is a part of WGA, thus argued that they were spoiled with choices that are geologically long-lasting and irreversible. One of these, they argued, is plastic pollution that is ubiquitous, and likely will be in the fossil records for future generations, and leave a permanent record on Earth⁹ (Zalasiewicz et al. 2016).

At a conference¹⁰ in Copenhagen, when I asked Marcus Eriksen, the co-founder of 5GYRES, about the link between plastics and the Anthropocene, he said without hesitation: “*Plastic is more anthropogenic than any other thing. Plastic is what defines our human lives at this moment*”. A month after the conference, 5GYRES posted the video *Does plastic pollution define the Anthropocene?* The picture that Eriksen is painting in the video is very much in line with how Zalasiewicz et al. see plastic as part of the Anthropocene. Sitting at the shoreline of a beach, with the blue water in the background, Eriksen narrates:

Does plastic pollution define the Anthropocene? I am sitting on a pile of pantyhose, here in a place called Dead Horse Bay. This is a 1950s landfill that is now exposed to the ocean and there are lots of glass bottles here (He takes some small bottles in his hands and shows them to the camera). Old things from the twenties, thirties and forties. It (the landfill) closed at 1953. And now it is all exposed. Lots of metal and ceramics. At the very top they were finding pantyhose, one of the first synthetic materials that was meant to be thrown away after it was torn and disused. So do plastics define the Anthropocene? What is the Anthropocene? It is a way of describing geologically our presence on the planet. We have as a species; we are a force of nature to change the surface of the planet. But can you find that layer that defined human kind? People have argued that it is carbon from the industrial revolution, or that it is fallout from the atomic era. I will argue that it is plastics! And here is why: Our research shows that plastic pollution is everywhere in our ocean and that it is settling down to the seafloor and creating a uniform layer of plastics everywhere. Every beach worldwide, ice cores, mountaintops covered in plastic... And that layer of plastic defined the Anthropocene. Our time, our species, our presence on this planet.¹¹

⁹ <https://www.theguardian.com/environment/2016/aug/29/declare-anthropocene-epoch-experts-urge-geological-congress-human-impact-earth> (9.12.2016) and <http://www2.le.ac.uk/offices/press/press-releases/2016/august/media-note-anthropocene-working-group-awg> (9.12.2016)

¹⁰ Plastic yoU-turn – How to bend the Corvette – NOT to end up with more plastic than fish in the oceans by 2050 (Was held 6.06.2016)

¹¹ <https://www.youtube.com/watch?v=urkf2besDck> (9.12.2016)

What this quotation from the video shows very clearly is a discourse of plastic's role in the Anthropocene. Eriksen's argument for plastic as a golden spike for the Anthropocene can be seen as a result of his deep engagement in plastic pollution in the last fifteen to twenty years. However what is also a part of his argument is that plastic pollution is everywhere around the globe and is entangled in every sphere of life in a much more concrete way than the impacts of the industrial revolution and the atomic era is. This is also what Zalasiewicz et al. (2016) show in the article "The geological cycle of plastics and their use as a stratigraphic indicator of the Anthropocene" where they focus on the geological cycle of plastic. In the article, they argue that plastic can be seen as a stratigraphic indicator for the Anthropocene. Within sediments, plastic comprise a good indicator of the Anthropocene strata (ibid., 12). What Eriksen ends up saying is that plastic defines our time, our species, and our presence on the planet. By seeing plastic as a way of defining the human species in this current time, he draws lines back in time, thereby saying that plastic is not always what has defined humans.

The need for a new epoch in Earth's history is, as we can see, not for discussion. By alerting us to environmental problems, the Anthropocene makes us aware of new perspectives of humans' relation to our surrounding environment¹² and asks us to raise new perspectives on to the nature-culture dichotomy that has been part of the anthropological conversation over time (Swanson et al. 2015, 150).

Nature and culture within the Anthropocene

Anthropologists since Franz Boas have been committed to investigating relationships between nature and culture, and the dichotomy between the two have been widely studied in the attempt to understand humans' relation to our surrounding environment (Helmreich 2011). Naming the present era the Anthropocene creates an awareness with scholars and the general public about how nature and culture are tied together, and how these two notions that have long been subject to a dichotomy within the scientific field might be a part of the same sphere. Further, it

¹² Terming this new epoch the Anthropocene can be raised into critique. For a discussion and critique of the term, see among others Tsing (2014), Chakrabarty (2009), and Haraway (2015).

opens up for telling new kinds of stories within the humanities, which is not necessarily subject to human exceptionalism.¹³ The term Anthropocene marks a “paradigm shift, in which the distinction between “nature” and “culture” will collapse along with the academic divisions that upheld it” (Swanson et al. 2015, 150).

The nature-culture dichotomy and the Anthropocene are interesting and relevant perspectives for understanding how plastic pollution is turned into and spread as an environmental problem. Plastic is, I will argue, no longer just “nature” or “culture”, but plastic pollution brings us, as we have seen so far, into new kinds of entanglements,¹⁴ new responsibilities, and asks us to pay attention to nature and culture in new ways. It has come to take part in alien forms of life (Helmreich 2009, 16–17). With its distribution, plastic has become a concrete medium that entangles. It entangles humans and nonhumans into the life of the “Plastic Age” (Freinkel 2011) and is step-by-step breaking down dichotomies.

If we look at plastic pollution from an Anthropocene scholarly foundation, then we will see new kinds of entanglements, and new kinds of responsibilities to not just the next generations but to more-than-human worlds as well. To look at plastic pollution from a scholarly basis, I find STS studies highly relevant as a starting point for my analysis.

STS and knowledge production

As mentioned in the introduction, the analytical framework for this study has been inspired by STS studies, a scholarly direction within human sciences, which in recent years has been allied with Anthropocene studies. The framework of STS thus started much earlier than the concept of the Anthropocene was introduced. In the book *Laboratory Life*, Bruno Latour and Steve Woolgar (1979) discuss the social construction of scientific facts based on a two-year long fieldwork in a biological laboratory. The book has been widely recognized, mainly for their main

¹³ Alongside the debate about the Anthropocene, new theoretical and analytical frameworks have arisen within anthropology as a discipline that aims to break the dichotomy between nature and cultural binaries. Among these is multispecies, interspecies, and more-than-human anthropology (Kirksey and Helmreich 2010; Kohn 2007; Tsing 2014; Haraway 2008).

¹⁴ A way of capturing the webs of interactions between all living beings (Van Dooren 2014, 4). The notion of entanglements is taken from Karen Barad (2007).

argument that the social world and the scientific world are not two separated entities. The scientific realm is instead a result of many operations in the social realm. Being concerned with the construction of scientific knowledge, their attention is directed towards the process where scientists are making sense of their observations (ibid., 32).

Latour was, by this scholarship, a pioneer in the studies of scientific knowledge as a social process by focusing his studies to the network of associations. According to Latour, science and society are explained more adequately when we analyze the relations among the forces that are present. For Latour, this implies that one needs to follow the translations, drifts, and diversions that are present in the formation of knowledge (Latour 1988, 7). While Latour mainly focused on the construction of knowledge, other scholars within STS placed their focus differently. The anthropologist John Law turned his attention towards the construction of things, while Michel Callon turned his attention towards the “symmetrical” relationship between humans and non-humans (Callon 1986; Latour 1988; Law 2002).

Today, STS studies is a central theoretical and analytical direction within many different scientific fields and is a key inspiration for this thesis, since relations between the social and scientific is also at stake in the construction of plastic pollution in the ocean as an environmental problem, and in the way that Plastic Change works with making plastic pollution a meaningful and significant environmental problem.

The relationship between STS and Anthropocene studies has in recent years strengthened. The following citation by Latour highlights this:

While the older problem of science studies was to understand the active role of scientists in the construction of facts, a new problem arises: how to understand the active role of human agency not only in the construction of facts, but also in the very existence of the phenomena those facts are trying to document? The many important nuances between facts, news, stories, alarms, warnings, norms, and duties are all mixed up. (Latour 2014, 2)

As Latour states, the important task for scientists is to try to understand the role of human agency in the creation and existence of a phenomena. What he highlights

is that we have to direct our attention towards the nuances that arise between facts, stories, norms, and more, since these are the issues that construct the facts that document a phenomenon. For a topic to turn from unknown to a topic of interest, into an environmental problem that is recognized not only by scientists, but also the general public, Plastic Change has needed to make the alien familiar and identifiable. In this interplay between facts, news, stories, and norms, the environmental problem of plastic has arisen. The challenge for Plastic Change is to get people to acknowledge that there is a problem and that it is a problem that must be acted upon. To be recognized as a problem, plastic pollution must be articulated before it can be placed into political and industrial contexts (Hannigan 2006,88).

* * *

What I have presented in this chapter is a complex environmental problem with many different facets. Plastic has moved into every sphere of human life within a short time span, and now plastic pollution in the ocean is taking part in alien forms of life. To understand how plastic pollution is made into and spread as an environmental problem in within the Danish Society, we need to focus our attention towards both new and old ways of looking at nature, culture, and our surrounding environment. With the problem and framework in order, I will now turn to the first analysis: How plastic pollution as an environmental problem is constructed.

CHAPTER 2

The Construction of Plastic Pollution as an Environmental Problem

An environmental problem is not self-evident on its own. Whaling, the ozone hole, the sixth extinction, and the increasing CO₂ concentration in the atmosphere all had to be constructed in the scientific field and recognized in the general public as environmental problems to become one (Hannigan 2006). This does not mean that whaling and the ozone hole are not problems in a material understanding, they are just not self-explanatory.¹⁵ It is changes and issues that need to be drawn attention to before they can be recognized as environmental problems. This recognition does not just happen everywhere at the same time, but problems are instead constructed in a particular place in relation to a particular public and thereby become public matters (Spector and Kitsuse 1977 in Hannigan 2006, 63).

The same is true for plastic pollution, which has only in recent years been constructed and recognized as an environmental problem in the Danish population. A recognition that Plastic Change has played a central role in. However, what has Plastic Change more precisely done in order to direct the public's attention towards plastic pollution as an environmental problem in Denmark and worldwide? One example is their Expedition Plastic, which will serve as the main case for my analysis in this chapter, since this was the project through which Plastic Change first raised attention to plastic pollution in the ocean.¹⁶

This chapter analyzes the ways in which Plastic Change produce knowledge and along the way discusses how plastic pollution in the ocean came to be constructed as an environmental problem in Denmark through Expedition Plastic. Based on the fieldwork I did volunteering at Christianshavn S/Y, I have identified

¹⁵ I here draw on notions from the “Science Wars” in the mid 1990s, which debated issues of scientific knowledge, and scientific objectivity and method. Postmodernist critics and scientific realists discussed whether or not scientific theories were social constructed. “Science Wars” designates, according to Latour, the reaction of scientists to the studies made of them (Franklin 1995; Latour 2004, 100, 144; Latour 2005).

¹⁶ <http://www.dr.dk/nyheder/indland/video-aktivister-staevner-ud-i-plastiksuppen#!/> (9.12.2016)

three processes which I see as essential to the way in which Plastic Change is able to make plastic pollution a topic of concern. These are: fundraising and practical issues, sampling, and witnessing. I argue that these three processes together construct the environmental knowledge through which Plastic Change construct plastic pollution as an environmental problem.

Firstly, I will give a historical account of the general development of plastic pollution in the ocean as an environmental problem. I will then shortly account for my analytical starting point, which is inspired by Latour and Woolgar's (1986) notion of the construction of scientific facts. The three processes will then be analyzed, looking at empirical examples and focusing on how relations assemble and facts about plastic pollution are produced and shaped. To do this, I draw first on two related approaches from STS studies: Latour's approach of following the daily and intimate processes of scientific work and Steven Shapin and Simon Schaffer's (1985) notion of the *multiplication of witnessing*.

From unknown to a topic of concern

When the first reports on plastic debris in the ocean came in the nineties and Moore discovered what was later known as the North Pacific Garbage Patch in 1997 (see chapter 1), plastic pollution was “just” plastic waste lying about on beaches, shorelines, and in the ocean. Year by year, more and more plastic waste lay about, and more and more people started to pay attention to it.

Carl, a project leader at Plastic Change and the captain at Christianshavn S/Y, expressed in an interview how he first became aware of the problem with plastic when he sailed in Indonesia with Christianshavn ten years ago:

One of the things that I noticed was how much plastic waste there was everywhere. Already ten years ago in Indonesia, I started to take pictures of plastic pollution and thought that it could be interesting to make a photo exhibition of plastics paradisiacal places. It never got further than just the idea, but it was caused by how extreme the amounts of plastic that we saw were. And it has just gotten worse since.

As Carl express in the interview, his attention towards plastic pollution started when he saw plastic lying paradisiacal places. Places that one would not think that plastic was either produced or belonged. Plastic waste had moved into a sphere of his attention, and it began to do the same for a number of people around the world. But how do we get from individual observations to organizations that start being worried about marine plastic debris? This is part of what this chapter sets out to explore.

In the United States, from where the first reports on marine plastic debris started in the beginning of the nineties, the concern was mainly towards wildlife and birds and fishes getting caught in plastic debris. Then, bigger plastic pieces were found in the stomachs of birds and fishes, and in December 2015 Barack Obama officially banned the use of microbeads (microplastic) in cosmetic products.¹⁷ An environmental problem is not static, and the US is a good example of how the object of concern and the core of the problem have shifted, from bigger plastic particles to a concern about microplastic. Not that wildlife is not of importance any longer; new areas of attention are just drawing the focus in new directions.

Worldwide, the numbers of organizations and alliances dealing with plastic pollution have increased steadily since 2000. In 2009, Anna Cummins and Marcus Eriksen founded 5GYRES, one of the most recognized organizations focusing on plastic pollution worldwide today. Their main goal was to put plastic pollution on the international agenda¹⁸. In September 2016, the global alliance BreakFree-FromPlastic was founded; a network of ninety NGOs from all over the world with the shared goal of changing our understanding and use of plastic.¹⁹ Plastic pollution has indeed been recognized as a global environmental problem in many different spheres and many different regions around the world.

As mentioned in the introduction to this chapter, the recognition of an environmental problem does not happen everywhere at the same time, and not neces-

¹⁷ <http://www.independent.co.uk/news/world/americas/us-president-obama-signs-ban-on-microbeads-in-cosmetic-products-to-reduce-plastic-pollution-a6791846.html> (9.12.2016)

¹⁸ <http://www.5gyres.org/5-gyres-faq/>. (9.12.2016)

¹⁹ <https://www.zerowasteeurope.eu/2016/09/press-release-a-vision-of-a-future-free-from-plastic-pollution-the-eu-must-rise-to-the-challenge/> (9.12.2016)

sarily with the same object of concern. In Denmark, the recognition of plastic pollution as an environmental problem only goes a few years back, and plastic pollution as an environmental problem only started to move into the public's attention around two years ago with the founding of Plastic Change. On a skiing trip in December 2015, I accidentally ended up living with an anthropologist and former employee at the World Wildlife Fund (WWF) in Denmark. After telling him about my fieldwork, he explained his own concern and knowledge of the problem. As he worked in the WWF between 2007 and 2012, he became aware of plastic pollution as an environmental issue and presented the problem to the organization. In around 2010, this was not an issue that the organization found important to address as part of their work, and his idea was shot down. In 2016, plastic pollution in the ocean has indeed become a topic of concern in Denmark, and in august 2016 the WWF also started different smaller initiatives with the focus on plastic pollution.²⁰ Awareness about plastic pollution as an environmental problem has escalated in Denmark. As can be seen in the example plastic pollution in the ocean was not an issue of concern in WWF Denmark in 2010 but is one in 2016.

According to sociologist John Hannigan, it requires a unique blend of knowledge, timing, and luck to have an environmental problem on the agenda in both the general population, with then industry and the political system (Hannigan 2006,74). On a visit to Denmark, Eriksen expressed how he had been working with plastic pollution in the ocean for fifteen years, and in two years Plastic Change had achieved the same as he and 5GYRES had done in fifteen years. Following Eriksen, Plastic Change has indeed had knowledge, timing, and luck, which have made them achieve great things in a short space of time. On the basis of Plastic Change's work, environmental organizations in Denmark are starting campaigns and signature petitions, and recently Denmark's Society for Nature Conservation started the campaign "No to micro-plastics".²¹ The development from a focus on bigger plastic items to a focus that also includes microplastic has been fast in Denmark, compared to the US. A range of scientific reports and knowledge about plastic pollution already existed, which meant that the develop-

²⁰ Among these the projects, Wildlife Reporters: <http://www.wwf.dk/?17260> (9.12.2016)

²¹ <http://www.nejilmikroplast.dk> (9.12.2016)

ment in Denmark could be much more compressed and that plastic pollution could be recognized as an environmental problem much faster.

Based on Plastic Change's work, plastic pollution has been widely recognized as an environmental problem in the Danish population within the last two years. But how has Plastic Change accomplished this success? And how has Plastic Change achieved to construct plastic pollution in the ocean as a topic of concern, in such a short time span? In the organization's first year, their main focus was, according to Natasha, the communication consultant at Plastic Change, Expedition Plastic. It was their "flagship".

Analytical starting point

The issue of plastic pollution has indeed turned from being unknown to a topic of interest in the Danish population and worldwide as can be seen in the above section. Inspired by Latour, who is concerned with the social construction of scientific knowledge, I find it relevant to examine how environmental knowledge and awareness have been constructed along the way. Latour and Woolgar's attention is in *Laboratory Life* directed towards the process, where scientists are making sense of their observations (Latour and Woolgar 1986, 32). Inspired by their work, I take *process* as my starting point, but instead of looking at how scientific facts are constructed, I am as previously mentioned looking at how knowledge about plastic pollution is produced and how plastic pollution in the ocean is thereby constructed as an environmental problem.

In his study of scientific practices, Latour closely followed the daily life and intimate processes of scientific work (Latour and Woolgar 1986). Thereby he was able to capture the processes through which facts were made in a laboratory. By volunteering at Christianshavn S/Y, I was also able to follow the daily life and the intimate process that was part of how Plastic Change as an organization, with volunteers as actors, constructed plastic pollution in the ocean as an environmental problem. Using the same analytical frame as Latour, I modify his question slightly. Instead of asking how scientific facts get made, I ask how an environmental prob-

lem gets made, and how Plastic Change makes plastic pollution in the ocean a topic of concern in Denmark.

In STS, authors have often highlighted the role of elements such as technologies, laboratory practices, accidental events, errors and conversations in the break room in the making of scientific knowledge's facts and in the making of things (Latour and Woolgar 1986; Latour 1993; Law 2007). In the construction of an environmental problem, these elements also play a part; however, I have turned my focus to the elements that were present to me during my fieldwork. What I found to be of importance, in the case of Plastic Change and Expedition Plastic, was funding (together with different practical issues), sampling, and the multiplication of witnessing. These elements and processes, however, are essential in the process through which plastic is becoming an environmental problem within the Danish society. I will start out with an analysis of fundraising and the practical issues that were present at Expedition Plastic and analyze how these processes took part in the construction of environmental knowledge about plastic pollution.

Fundraising and practical issues

To have an expedition ship sailing is neither cheap nor easy. It requires funding or at least money and that a range of practical issues work their way into place. In this part of the chapter, I therefore wish to analyze the economic and practical dimension of the expedition. I wish to do this since these two elements are necessary parts of the data and knowledge production. If there was no money to keep the ship sailing and no one to participate in the practical things that needed to be sorted before the expedition, no samples would be collected.

At a get together in a bar in Copenhagen in November 2015, I realized that the expedition was not entirely funded. A few days earlier, I had just been told that they wanted me on board, and the rest of the crew and I were all full of excitement and joy. What we were told was thus, that the expedition was not fully funded, and that even though we had been chosen, we would have to wait one month before they could give the final go. Another issued that was discussed that day was how the two captains and project leaders pictured how we as volunteers

should take part in the preparation. Sebastian, one of the captains, made much of giving us titles that were linked with an area of expertise and thereby also different tasks. Laura was appointed communication manager for the first part of the trip, Katharina was appointed biologist and in charge of the research together with Hanna, and I was appointed lifeguard and ship's doctor. I was holding a first aid course before departure, should try to fundraise a defibrillator, and was in charge of buying and controlling all the first aid equipment that we needed. Further, we all had to think of possible donors and call them. Their wish was to have new sails, new solar panels, a water maker, and a wind turbine, but less would also be enough. Making calls and sending emails to possible donors was harder than I thought. I experienced awkwardness about asking for money, even though I thought that the project was good. I shared my experience with Sebastian, who at that time was calling a range of possible donors every week. He told me that he had also thought it was tough in the beginning. He tried to tell the ones he spoke with how they could become a part of the story about stopping plastic pollution: That their company through us could tell stories.

The frustration of having a lot of volunteer work to do before the expedition, and the feeling that very few things were under control, was articulated when we were on the slipway in Colombia. It was not only me who had a feeling of awkwardness about asking for help or money to the expedition, or had the feeling that few things were under control.

Hanna, Katharina and I are once again discussing the project. We have been on the slipway in Colombia for a few days, and are step-by-step coming to realize different challenges within the project. Katharina narrates how she first became acquainted with the organization. It was in in the TV news on DR [Danish Radio – a Danish national TV station]. She saw a biologist taking sediment samples, and got inspired right away. She had the feeling that they knew what they were doing. It was first when everybody besides her had travelled to Colombia that she realized that “nothing was under control”. Katharina had as the biologist, been in charge of finding filters, glasses, and other equipment that we needed on board to do research. She had been in charge of finding and transporting all the research equipment. Further, the trawl needed to be welded, which a friend of her father could luckily help her with. The process had frustrated her quite a lot. She thought that she had applied to be part of an expedition where most stuff was under control, but instead she had ended up working her arse off, while at the same time having a

full-time job alongside. She had budget of 3,000 DKK – “Out of a budget on 200,000 DKK,” she explains with irritation in her voice.

The 200,000 DKK that is mentioned in Katarina’s last comment is not accurate but shows very well the scale of money that was used. All crew members paid to be on board: a fixed amount before departure, which was used on the general maintenance of the ship, and during the trip for gas, berths for the ship, and food. The amount of money that all crewmembers paid to be on board was mostly use on the docks, getting Christianshavn S/Y in a good condition. As Christianshavn S/Y is an old, steel ship, it was not a cheap task.

The amount of money used for the sample equipment was discussed often in Colombia:

Sebastian and Katarina talk about some of the filters that need to be used in the sampling. They cost 210 DKK per sample. “That is quite expensive,” Katarina concluded. Especially when she only has 3,000 DKK in total. Sebastian quickly estimates that every sample has the price of 10,000 DKK, if you take into account what it costs just to have the ship sailing.

If you look at the account I have given about the practical dimensions of the project, then the last two empirical accounts show how much money meant for the expedition to be sailing but also for the possibilities of the sampling. This makes explicit how money is not an insignificant part of the knowledge production in this case. Money, our roles and work as volunteers, and the condition of the ship were all elements that defined and shaped one another. The practical difficulties linked to these elements were an important part of the framing of the expedition in the beginning. I will elaborate on this in the next empirical example:

Hanna, Katarina, Jonathan and I are talking in the saloon [the main room under deck]. We have to figure out a way to store all the research equipment in the best possible way, before we set out to sea. Earl has built a closet to store some of it in, but there still is not enough room. We have to find storage space for the glasses where the samples will be. “We will find the room for your glasses,” Jonathan says with the best intentions in his voice. “The research is after all an important part of the project.” Katarina becomes a bit offended and raises her voice: “I would say that it is the MOST important part! And stop saying that it is my

glasses and my project (she looks at Jonathan). It is “our” ” project, or I would even say Carl and Sebastian’s project.

What Katarina gets offended by in the situation is how she was very much equalized with the sampling and the knowledge production. Not a position that she herself had taken but rather a position that was given to her by Sebastian and by the work she was in charge of. Jonathan on the other hand, who had studied psychology and was trained as a carpenter, was at that time not involved with the sampling itself and was more interested in getting the ship to sail.

What is central in the paragraphs is how we as volunteers were quickly involved in all the different processes that needed to fall into place before we could even start the knowledge production itself. For Plastic Change as an NGO, this meant that they needed to give the volunteers some sense of ownership for the expedition, since most of the work that had to be done was in our hands. There was no money within the organization to pay for a project coordinator at that time. The only ones who were paid were Sebastian and Carl, the two skippers, whose main job was to get the ship sailing in itself: to plan all the practical issues of just getting the ship to sail. As we can see, money is an essential part of the practical issues, and the most important part in the examples described and for the expedition as a whole.

I would like to propose that all these practical issues and questions of funding are highly relevant in the work. These processes are an important part of Expedition Plastic, which is a central project for Plastic Change in constructing plastic pollution as an environmental problem. If there were no volunteers and crewmembers to pay money to be on board, and no hands to do the hard work or to get all the practical issues sorted out, there would be no Expedition Plastic. The volunteers are thereby a central part in the construction of plastic pollution as an environmental problem.

A key issue that Latour draws attention to is how “social” factors disappear once a fact is established (Latour and Woolgar 1986, 23). I find this interesting, since this was also what I identified in the production of samples and knowledge on Expedition Plastic. Fundraising and practical issues were factors that meant a great deal for how we as volunteers were able to perform the sampling, which lat-

er lead to a knowledge production. Following the daily life and intimate processes, I will by this section argue that the volunteers and the money and work they put into the project were highly important in Plastic Change's construction of plastic pollution in the ocean as an environmental issue.

In his work, Latour is indeed focusing on the practical dimension of knowledge production, and if Latour were to do the same laboratory studies today, I would argue that funding would also be an important part in his studies. A reason why he did not pay attention to funding at that time was part of the historical moment. At that time, automatic funding meant that scientists had to pay little attention to money, while most scientists today have to apply for grants. Funding is thereby much more important now than it was then, just twenty to thirty years ago. As we see from my analysis of the practical processes in Expedition Plastic, fundraising is in the center of the practical issues. All the practical elements and the way people talked about what was possible and what was not is all related to money or the lack of it. Fundraising for the project and the practical tasks are processes that made the sampling possible.

Sampling: Measuring microplastic in the ocean

During my analysis and work with the material, I realized that what I had been witnessing and taking part in at Christianshavn S/Y was not knowledge production in the way that I had expected when I started my fieldwork. As I started my fieldwork, I had the understanding that the samples that we took while sailing would shortly after be analyzed, and thereby would be translated into concrete data and knowledge that would in a short time span end up in a global dataset (Plastic Change 2016d). The other volunteers had thought the same. However, it was only the first part of the knowledge production that we actually took part in: the sampling of microplastic.

One of the issues that is central with Latour is the multifaceted character of scientific practices. Inspired by sociologist Karin Knorr-Cetina, Latour draws attention to how scientific practices are local, heterogeneous, and contextual (Latour and Woolgar 1986, 152). These issues are present in the lab, where scientific re-

search is made, but they are even more present in sampling for microplastic on a sailing ship.

The main sampling that we carried out was of particles with a size bigger than 0.335 mm. It was conducted with a manta trawl, a metal rectangular box with an opening of 15 cm x 45 cm, on which a long net which ended in a small tube was fastened (Knudsen 2015,13–14). The sampling followed a protocol developed by 5GYRES (Appendix 1,2). The manta trawl trawls the surface waters and is designed to take approximately ten centimeters of the upper surface layer, which is where a large portion of plastic is situated, due to it having a lower density than water and thus a high buoyancy (Knudsen 2015, 13). Surface trawling with nets are currently the most prevalent sampling type and were, for instance, used on twenty four expeditions from 2007–2013 and were the basis of an article that estimated that more than a few trillion plastic pieces weighing over 250,000 tons are afloat at sea (Eriksen et al. 2014; Hidalgo-ruz et al. 2012 in Knudsen 2015, 13).

In order to understand the process as best possible, I both observed and participated in the sampling. Further, I asked Katarina and Hanna about the procedure in semi-structured interviews and informal conversation in order to better understand the procedure.

I can see that Katarina knows how to do everything now. She walks around in the blue smock that she has borrowed from Hanna. I remember when I, in the beginning of our trip, showed Katarina the book Alien Ocean by Stefan Helmreich. Katarina lighted up. "It is my education he is referring to." Katarina is educated as a biological oceanographer and has worked with a range of things, from seaweed in Australia to the marine coastal environment in Greenland. Being 36 years old, she radiates a knowledge and environmental awareness that one can only be inspired by. It is her trawl number thirty one. She does everything step by step. She brings out the metal boxes, the net, the sock as we call it, lines and a screwdriver from the stern of the ship. Katarina works fast and steadily. Within a few minutes everything is lined up and screwed together on the port side, and without help the pole that is holding the trawl is put up and the net is dropped in the water on port side.

After approximately four hours in the water, the trawl is taken up and the sample can now be sorted:

The sock is taken off the net, and the contents in the sock are being rinsed down into three round gratings. As the sock is turned inside out, Hanna is sprinkling it with water, to get the plastic pieces that might be sitting on the sock into the sample. When everything is out, we start the sorting. Every leaf or biological material is being sorted out, sprayed with water above the gratings and cast aside. With tweezers, Hanna and Katrina are first looking for plastic pieces above 5 mm in the first grating. Hanna looks at me. “You can argue that it is pretty subjective, what one estimates as plastic. In this sample, it is hard to distinguish plastic pieces and phytoplankton from one another” Suddenly, she has something: A small piece of plastic sting (Photo 2). Using the gratings, the samples are divided in size: above 5 mm (by eye), between 5 mm and 1 mm (by eye), and between 1 mm and 0.350 mm (rinsed into a bottle) and then stored in glass bottles which will later be sent home to Denmark.²²

In my conversations with Katarina and Hanna, I came to realize early on the many different uncertainties that were present in the sampling.²³ Camilla, a for-



Photo 2 – Hanna is sorting a sample

²² This field note is from the voyage from Panama to the Galápagos Islands, while the above is from the voyage from the Galápagos Islands to Los Angeles.

²³ In Appendix 3, I have outlined the uncertainties that Hanna and Katarina identified as being present at the trawl on 16 February 2016.

mer environmental chemistry student with Plastic Change, had found a large number of red fibers in some of her samples from the last expedition (Knudsen 2015). At that time, her assumption was that the red fibers came from unwashed red Plastic Change T-shirts, which we all wore from time to time. When we made the trawl ready the first day, Katarina quickly stressed:

“The red fibers in Camilla’s samples were for sure from the ropes that are holding the trawl. The fibers get worn off and into the samples. Sebastian says that they have always used them. I do not understand why they have not used rope from natural materials. Kristian [an environmental biologist] and Tom took part in the sampling the first time. They must have thought about it.” We talk back and forth, after which Katarina concludes: “It just shows how dependent we are on plastic. Even in Plastic Change.”

As Katarina then argued, the rope used for the sampling was made of plastic fibers, but from what we knew, nobody had thought about it earlier. If we take that nobody had thought about it earlier to be true, then it is interesting how the rope was not seen as plastic in this specific context. What is defined as plastic in a scientific context (synthetic and semisynthetic polymer chains) differentiates from what people see as plastic in the context of sampling. What this empirical example shows is how the sampling that was done was very much affected by the contextual and multifaceted perspectives (Latour and Woolgar 1986, 152). As Hanna argued when she was sorting a sample, how one defines plastic in the sampling process is therefore a subjective matter. In her case, the subjectivity was very explicit, but in the case of the rope it was less visible. In the next section, I will analyze and discuss how the samples and the subjectivity of the process took part in the production of environmental knowledge.

Environmental knowledge

The samples that we took thus had two problems that affected the knowledge production and thereby the environmental knowledge produced. First of all, the samples were not a standard collection (some of them could even be characterized as “bad” samples according to Katarina) and, secondly, we came to realize that there

was no money to have the samples analyzed. Below, I will briefly exemplify the two problems.

Katarina had a wish to change the world and to do something meaningful, but instead she had been thrown into a project that was very far from the standard and the structures that she was use to:

The first times Katarina and Hanna set the trawl, it took three people around 45 minutes to get everything ready. Katarina expressed, with confusion and irritation in her voice: “It is really Bruin²⁴ like. I am not used to working with such a large number of uncertainties.”

As described previously, from the conversations with Katarina and Hanna, I came to realize early on the many different uncertainties that were present in the sampling: problems with large amounts of phytoplankton (which made it hard to separate biological material from plastic pieces), problems with how the trawl behaved in the water, and problems with polluting our own samples were just some of the issues that were at stake. Further, Katarina and Hanna had to “train” themselves in this specific sampling practice, with only help from different protocols and a little help from Sebastian. Step by step, different uncertainties were eliminated due to more experience and a greater understanding of the practice being performed. There were some factors that we could control, such as keeping the sailing direction constant, but some factors, such as the amount of phytoplankton in the water, were due to local conditions and were not in our control.

The second problem has to do with the analyzing of the samples, because where did the samples end up? My informants thought that they were about to take part in a data production of amounts of microplastic in the ocean, but day by day we all realized that it was not the case:

Hanna, Katarina and I are once again discussing the project. We have been on the slipway in Colombia for a few days, and are step by step coming to realize different problems within the project. I thought that we were “collecting” data. Literally. And that the data that we produced would end up in a global dataset shortly

²⁴ A cartoon figure. Dressed in red bib overalls, he travels the world with the ship Mary but is not always lucky.

after. According to Hanna, we are collecting – but the samples do not become data right away. The samples will just end up in a refrigerator at Roskilde University. There is no one to handle and analyze the samples.

To most of us, this was an unknown element that frustrated us; namely, that we were using so much time, energy, and money just to get some samples in a refrigerator. This was especially so for Katarina, who felt that she had been cheated. As a sprawling remark Katarina stated: “*The good thing about plastic is of course that it never perishes*”, thereby hoping that the samples would be analyzed one day in the future. Through conversations, both her, I, and the other crew members came to the realization that the trip that we were on was more a transport part, where they needed to have the ship transported from A to B, more precisely from Colombia to Los Angeles, than it was a part where Plastic Change wanted scientific valuable samples.²⁵ All along, their main focuses had been the gyre in the Sargasso Sea and the North Pacific Gyre. Having thought that the research part was of highest propriety and the main focus of being out here, I started to sense that it was not as important as I had thought.

As outlined, many frustrations, uncertainties, and doubts were at stake in the first couple of weeks of the expedition. Anthropologist Mathijs Pelkmans argues that lived doubt points towards the question of “what to do?” He differentiates doubt and uncertainty by arguing that uncertainty is the context in which doubt is activated. Doubt is “being of two minds” (Pelkmans 2013, 2–4). In the sampling process Katarina is in a context of uncertainty, whereby her doubt gets activated. In an interview after her first sampling, she expresses how she is very constrained by believing in a “biological professional success”. “*I believed that I should only lend a hand with the research, and then I stand with the main responsibility for sampling with an unsecure method, that I know very little about.*” At that time, Katarina was of two minds but, as Pelkmans also highlights, then the ungraspable nature of doubt seemed to disappear when it is articulated and performed in action (ibid., 32). This was also the case for Katarina who, as the time went on and as she made several samples, ended up placing the doubt in the background. Once in a while it was still present,

²⁵ This has later been very explicit on their webpage, where our part of the expedition is not described: <http://plasticchange.dk/vores-dokumentation/ekspedition-plastik/> (09.12.2016)

but in the construction of plastic pollution as an environmental problem there were no room for doubt in the foreground. That Katarina were aware of, but once in a while she still expressed her frustrations:

As Katarina and I do the dishes one evening, Katarina once again expresses her frustration about the sampling. It is her professionalism as a biologist that is at stake. It is confusing her quite a lot. "We are just a PR stunt," she explains with a mixture of frustration and despair.

But what does it mean for something to be "just a PR stunt"? And what kind of knowledge might be produced when scientific facts are not established?

At the time when Katarina and I did the dishes, neither her nor I understood that being a PR stunt was not as bad as we felt at that time. Maybe being a PR stunt was what made plastic pollution in the ocean an environmental problem within the Danish society. Even though we only thought that we were sampling, and not creating any knowledge at all, I will argue in the next section that we might create knowledge after all. You can have good samples that are properly collected but that just do not get analyzed, or you could have poor samples that get analyzed. In the case of the samples we collected, neither was the case. Our samples were somewhere in-between. The practice of sampling thereby gained validity in another way and in another arena, even though it would have little value in a scientific journal. I would argue that the sampling was not the best scientific practice, but that it was not bad practice. Just being out there mattered in the construction of plastic pollution as an environmental problem, since scientific knowledge and environmental knowledge are products of various interactions in social, political, and economic spheres (Latour and Woolgar 1986).

What I have shown so far in this chapter is that the data, through sampling, will not necessarily be termed "scientific facts" and be valid in the way that scientific facts are based. But what kind of knowledge might be produced when scientific facts are not? I argue that another kind of knowledge was produced; a kind of knowledge that was just as important. In my analysis of the processes within Expedition Plastic, which enabled Plastic Change to construct plastic pollution in the

ocean as an environmental problem, I see the practice of *witnessing* as an answer to the questions that I have outlined in this section.

Witnessing

In *Leviathan and the Air-Pump*, the professors in history and philosophy and sociology of science Shapin and Schaffer (1985) analyze *the role of witnessing* in the production of facts. As Latour, they ask how knowledge about nature and culture are made, how things become facts, and how we can understand experiments. Instead of using an anthropological method, they use a historical approach and analyze Robert Boyle's air-pump experiments in the 1660s and the debate between Boyle and Thomas Hobbes that followed.²⁶ What Shapin and Schaffer draw attention to in their analysis is the process of witnessing, whereby witnessing becomes key in the making of knowledge. What is central is how and why certain practices are accounted as true and proper (ibid., 14), and to answer this they identify three ways of multiplying witnessing: *eye witnessing*, *facilitating the replication*, and what they call *virtual witnessing*.

In this section of the chapter, I will analyze how the process of sampling gains validity in another way than the scientific way. Inspired by their thoughts and arguments, I see witnessing as the third process that is central for the way in which Plastic Change produces knowledge about plastic pollution in the ocean. Even though Shapin and Schaffer look at witnessing with the production of facts as their object of research, it has some interesting perspectives to offer to the construction of an environmental problem. In case of the Expedition Plastic, all three processes are highly intertwined, but the separation of them can hopefully give a better understanding of the processes.

²⁶ Shapin and Schaffer's analysis of the air-pump experiment Latour also highlight in *We have never been modern* (Latour 1993, 15–16).

Eye witnessing

For Boyle and other English experimentalists in the 1660s, their experiments and the products that were tested had to be attested by the testimony of eye witnesses (Shapin and Schaffer 1985, 56). As Boyle stated then “that they that have seen them can much more reasonably believe them, than they that have not” (Boyle in Shapin and Schaffer 1985, 56). Witnessing is, according to Boyle, a collective art, and as Shapin and Schaffer analyze it, then the multiplication of witnessing, is an indicator of “a true state of affairs in nature” (ibid., 56).

In the case of Expedition Plastic, the multiplication of witnessing, with direct witnessing, was not ensured through the performance of sampling in a social space such as it was done with Boyle’s experimental practices (ibid., 56). The performing of the experiment before direct witnesses was instead what we as volunteers took part in on the ship. The part of the expedition that I took part in was the sixth or the seventh stretch, and fifty-five trawls had been made before we started (Plastic Change 2016d). Volunteers and scientists before us had used the exact same trawl on Christianshavn S/Y, and had thereby also been eyewitnesses of the sampling processes.

What Shapin and Schaffer also draw attention to is the credibility of witnesses. As witnesses of the air pump experiments, professors were considered more reliable than peasants. This means that the profession of the eyewitnesses has significance and that some are considered as more reliable witnesses than others (ibid., 58). I will argue that this is also the case on our part of Expedition Plastic. Katarina, the marine biologist, who was in charge of the sampling, was talking on videos about the research that was uploaded on Facebook, commented on the research in news articles, and was also interviewed by Danish media when we returned home.²⁷ Thereby, she was portrayed as a reliable witness by the organization. With her profession and knowledge, she was the best to testify about the quality and validity of the sampling. She was performing and thereby replicating the practice of sampling. Having Katarina as a reliable eyewitness and replicator (as I will turn to shortly), made the multiplication of witnessing more trustworthy.

²⁷ She was among other things interviewed live at the radio program *P1 Morgen* and in the TV program *Go’aften Danmark*.

Replication

Another way of multiplying witnessing was by facilitating their replication. What was central in this way of witnessing was that protocols were reported that enabled people to perform the experiments themselves, thus ensuring distant but direct witnesses (Shapin and Schaffer 1985, 59).

One can argue that Expedition Plastic was already a part of the replication phase in the construction of plastic pollution as an environmental problem worldwide: The method that we used was a replication of a method used by 5GYRES and other NGOs. The manta trawl that Plastic Change uses had been used on a range of different expeditions, since 5GYRES lend it out to organizations who were interested. This meant that the method of sampling was widely used, and the replication of the sampling had been ongoing since 2007. In relation to the worldwide attention to plastic pollution, and the construction of plastic pollution as an environmental problem worldwide and mainly in the US, we were part of a replication.²⁸

In the construction of plastic pollution in the ocean as an environmental problem in the Danish population, Expedition Plastic was not a replication but was instead the first eye witnesses of the problem. An example of how the sampling was replicated in a Danish context is instead a short expedition in Denmark.

In April, Expedition Plastic in the Pacific received 200,000 DKK from Crown Prince Frederik and Crown Princess Mary's fund. For that reason, Plastic Change arranged a 20-day expedition in around Zealand in June 2016 and invited the crown prince of Denmark to participate in the expedition. He accepted the invitation and he and the environmental minister participated for one day of the trip, which created an enormous media coverage.²⁹ From this short expedition, Plastic Change replicated the sampling that they used on the larger expedition, thereby ensuring direct witnesses. Instead of making this replication of witnessing more distant, as we see with Boyle's publishing of an experimental series of letters, whose aim was to have other experimentalists replicate his experiment (*ibid.*), the expedition in Denmark ensured witnessing that people in the Danish population

²⁸ See Eriksen et al. (2015) for an example of how the sampling was replicated.

²⁹ <http://plasticchange.org/our-documentation/expedition-plastic-in-denmark/> (9.12.2016)

could even better relate to. Further, the crown prince and the environment minister were, like Katarina, seen as highly reliable witnesses due to their position and status in Danish society.

Virtual witnessing

The most important practice of witnessing is what Shapin and Schaffer identify as virtual witnessing, which “involves the production in a reader’s mind of such an image of an experimental scene as obviates the necessity for either direct witness or replication” (Shapin and Schaffer 1985, 60). In the case of virtual witnessing, the multiplication is unlimited. What Shapin and Schaffer analyze as central for this kind of witnessing in the case of Boyle is how he was able to construct texts in such a way that his experiments were agreed to be reliable. His writing of experimental reports were thereby of equal importance as doing the experiments themselves (ibid., 60–63).

In the case of Expedition Plastic, this virtual witnessing was done in many different ways. First of all, Plastic Change made different press releases that were published in different Danish media while we were away. DR and the free daily newspaper Metro Express, among others, published these releases.³⁰ Further, there was a person in charge of communication at all times. On the first part of the trip, it was Laura, who worked in the advertising industry, whose job was mainly to record short films, take pictures, and make short updates that were sent home and published on Plastic Change’s Facebook page. On the second part of the trip, the communication manager from Plastic Change, Natasha, was in charge of the communication, and in addition to what Laura had done, she also had her own webpage from where she publishes short stories from the expedition. In addition to the things just mentioned, all of us as volunteers also published pictures and news on our own Facebook profiles.³¹ Even though the examples that I have just mentioned are not virtual witnessing in the sense that Shapin and Schaf-

³⁰ <https://www.dr.dk/ligetil/dansk-skib-jagter-plastik-i-verdenshavene> (9.12.2016) and Appendix5

³¹ It was a narrow audience that in the beginning of my fieldwork (December 2015) received what the organization and we as volunteers published on Facebook. Over time, the Facebook page was “liked” by more people, and their outreach has increased. The numbers of followers have doubled from around 10.000 (December 2015) to 19.351 (December 2016)

fer use it to describe the practice that Boyle used, I will still argue that it can be seen as a kind of virtual witnessing.

According to Shapin and Schaffer then, “The ability of the reporter to multiply witnesses depended upon readers’ acceptance of him as a reliable testimony” (Shapin and Schaffer 1985, 65). We as volunteers were put in a position where we were validating the phenomenon as matters of fact. Christianshavn S/Y and the crew was, as Plastic Change’s flagship, thereby the reporter of a testimony about plastic pollution at the ocean. As I have shown in this section, people have responded, validated, confirmed, and witnessed how Plastic Change have produced knowledge about plastic pollution. This highlights that you cannot make a fact on your own and that you cannot make a problem on your own. People and different processes are part of the making of the problem.

Bearing witness

As I have analyzed through the use of Shapin and Schaffer’s framework, the process of witnessing can take many forms. Another process of witnessing that I would like to include is what Greenpeace terms as “bearing witness” (Connolly 2009, 20). Bearing witness is a practice that Greenpeace have identified themselves with since they started in the 1970s, and it is explained as: “using peaceful means to draw attention to actions that the group believes are wrong” (ibid., 20). What is central for Greenpeace is the closeness to action and a willingness to make sacrifices. I find this kind of witnessing important to include, since this was the practice of witnessing that the employees at Plastic Change compared the expedition with. The following field note serves as an introduction to the term before I discuss it.

We sit in a circle around the bonfire. It is in the beginning of June. The night is cold, and we are all wrapped in blankets. It’s around 2 a.m. at night. We are all looking into the flames of the fires. It has been two to three months since we last met. Some of us took part in the first part of the expedition (from Colombia to the Galápagos Islands), others took part in the expedition from the Galápagos to Los Angeles, and a few were a part of the expedition for the entire three months. We discuss life, love, sailing and plastic. We discuss the differences between Greenpeace and Plastic Change, when Katarina says: “You cannot just cling to a piece

of microplastic and stay hanging.” We all laugh, with pictures in our minds. I myself have two pictures in my head: one picture of a person that is clinging himself onto a small buoy on the open ocean, and one of a man that is splashing frantically on the surface in order to grab some microplastic that can keep him floating.

What Katarina is referring to is how Greenpeace activists in the eighties and today cling to drilling platforms in order to push different oil companies to stop their oil drilling in the Arctic. In 2010, four activists clung to Cairn Energy’s drilling platform on the west coast of Greenland for two days, and in 2015 a similar event took place at Shell drillings.³² With her example, Katarina is drawing our attention to the way Plastic Change is bearing witness, and that it is different from how Greenpeace did it earlier. Plastic Change cannot just cling to microplastic and thereby stop the production of plastic. What Plastic Change instead did was to launch an expedition ship, which in many ways is inspired by Esperanza, a ship Greenpeace launched in 2005. As Greenpeace explains it themselves, the aim of Esperanza was to “bear witness to the state of the ocean, drawing the world’s attention to problem areas as publicizing the damage done by overfishing, widespread whaling, and industrial pollution” (Connolly 2009, 27). What they did in order to put focus on their mission, was to make press releases, interviews, weblogs, and webcam diaries of the mission. This is also what Plastic Change has done. Carl explained in an interview how one of the things they took along from Greenpeace was how important it was to be at the site. He elaborated: “*Then you have a much more powerful mandate to speak from*”.

* * *

As I have argued in this chapter, an environmental problem is not just made into a matter of concern on its own. Different practices and processes take part in the construction of the problem. Practical issues and funding, sampling and witnessing were the processes through which Plastic Change produced environmental knowledge and thereby made plastic pollution an environmental problem within

³² <http://sermitsiaq.ag/aktivister-klamrer-boreplatform> (9.12.16) and <http://www.greenpeace.org/usa/arctic/stopping-offshore-drilling/> (9.12.2016)

the Danish society. These processes turned plastic pollution into a meaningful and significant environmental problem.

In order to answer my problem statement, I will now turn towards how that knowledge are being spread and how Plastic Change have communicated different aspects of plastic pollution to the general population in Denmark.

CHAPTER 3

Storying and Discourse

In order to communicate information about plastic pollution to the general population in Denmark, Plastic Change has not just told one story about plastic pollution but many. Since plastic pollution has originated from many different sources and places and the effects of plastic pollution vary, Plastic Change has found it important to communicate these diverse sources and effects in their attempt to raise awareness. Environmental scholars and NGOs agree that “we need stories that can reconnect people with the distance and ongoing impacts of their waste” (Van Dooren 2014, 23). But which stories have Plastic Change chosen to tell to spread knowledge and awareness about plastic pollution?

Knowledge about plastic pollution in the ocean travels and is entangled in practices of *storying* and *discourse* as it becomes public knowledge (Helmreich 2009, 18; Van Dooren 2014, 69). Drawing on the work of Australian philosopher and environmental humanities scholar Thom Van Dooren, I take *storying* as the point of departure for this chapter. By using the word *storying* instead of *storytelling*, I wish to draw attention not only to the words but also the materials that are being woven together into context and meaning (Van Dooren 2014, 10, 68–69). Plastic Change does *tell* stories, but what I wish to highlight by using the concept of *storying* is that knowledge production and *storying* are entangled from the very beginning of the knowledge production process, and that stories and materials are being woven together in both the making and spreading of plastic pollutions as a meaningful and significant environmental problem in the Danish Society. This is done to show how the different stories work together in the creation of a broader conversation, discourse and practices in the Danish population.

This chapter is thus not an attempt to make a discourse analysis, and the notion of discourse that I am going to develop will be elaborated on in second part of

this chapter.³³ Instead, I wish to show, analyze, and discuss the notion and importance of stories. I wish to show the actual imagery through which Plastic Change are trying to reach people.

What this chapter aims to do is to show the complexity of the way Plastic Change have storied and created a discourse in Denmark. I will analyze the way in which Plastic Change have told different kinds of stories in order to present the problem to a broad audience and invoke action (Hannigan 2006, 63–78). They have not just done this based on their own experiences, they have borrowed and drawn on verbal and visual imageries and existing stories that have already been established in an international arena. The stories that I wish to analyze and discuss in this chapter are, first of all, stories that all deal with plastic pollution in one way or another. Secondly, they are all stories that try to make the alienness of plastic and plastic pollution familiar and identifiable. I argue that the stories Plastic Change tell take part in the creation of a discourse, while a more international discourse at the same time frames the stories that can be told. It is through these stories that the spreading of environmental knowledge occurs. Through storying, Plastic Change translates scientific environmental knowledge to relatable stories. Lastly, I will argue that the spreading of environmental awareness occurs not only through storying but also occurs due to how materials and semiotics are linked. To analyze this, I will use the example of knitted dishcloths.

Sailing on the seven seas

The first story that I would like to analyze is the story about Expedition Plastic itself. As I highlighted at the end of last chapter, Carl explained that he felt that the expedition gave them a powerful mandate and platform to speak from. As I will show in the following analysis, the volunteers also saw the expedition as a powerful story in itself.

³³ The notion of discourse that I start from is inspired from Van Dooren, Tsing, Law, and Foucault, who have in common that stories, discourse, and the materiality of the world are tangled up together (Van Dooren 2014; Tsing 2014; Law 2007; Foucault 1979).

The day before we reached the Galápagos Islands, we held a small seminar in the cockpit. When we had weighed anchor in Panama, I invited the rest of the group to read the introduction of Van Dooren's (2014) book *Flight Ways* and the chapter "Fledging Albatrosses: Flight Ways and Wasted Generations", which examines the impact of the massive plastic pollution at Midway Islands. My aim with the reading and the seminar was to discuss storying and communication. Many of the insights from that seminar will be used in the rest of this chapter.

When we discussed the relation between Plastic Change and many of the aspects of storying that Van Dooren highlights as important, Katarina stated: "*This voyage is indeed one big storytelling*". All the others shared Katarina's point of view. Jonathan expressed:

This research, and this mission... it gives the journey its legitimacy. And equally then the journey gives the research legitimacy. Then it becomes a story, which other people can relate to. You could of course make this research in other ways. With a real research vessel. But that is not as interesting as our trip. We are out there, where it happens.

Hanna continued: "*In some ways, it becomes more personal when we are on this little sailing ship rather than a big research vessel*".

In most of my semi-structured interviews with the other crewmembers, I inquired into what they saw as the most important part of the project. They all expressed in different ways that they saw the story about the expedition as the most important part. For Jonathan, the expedition was able to create attention amongst the general public which could then later lead to an influence at the political level. They all agreed that being on a sailing ship is much better for certain forms of storying than if we were sailing around in a big research vessel: The ship was a good platform for telling stories that were linked with practices of witnessing.

The story about Expedition Plastic falls into a current trend in the Danish media. In January 2015, the first episode of the Danish documentary series *Kurs*

*mod fjerne kyster*³⁴ was sent. The series follows the family Beha Eriksen on a trip around the world on a small sailing ship. The series broke all Danish TV records and became the most highly rated nonfiction program ever.³⁵ The interest for sailing has for that reason been increasing in the Danish population, and Christianshavn S/Y and Expedition Plastic falls right into the story about sailing on the seven seas.³⁶ The story is thereby interwoven with stories about fairytales, great adventures, and great challenges that make Expedition Plastic an identifiable and appealing story to many people. Just as Sinbad the Sailor in the Middle Eastern fairytale sailed the seven seas and experienced magical places, meeting monsters and encountering supernatural phenomena (Holm 2001), Plastic Change has also sailed the seven seas and experienced an entangled sea turtle (I will return to that story later) and alien forms of life (plastic and microplastic) on the open ocean and the shorelines.

As I analyzed and identified in the last chapter, witnessing and in particular virtual witnessing were central in the production of knowledge about plastic pollution in the ocean. Storying and virtual witnessing are thus closely linked. Through virtual witnessing, it is possible to produce an image in the reader's mind that makes the experiment or in my case the experience reliable to the ones who hear the story (Shapin and Schaffer 1985, 60–63). By sailing in the ocean, being at the heart of the problem and witnessing the environmental problem at its core, Expedition Plastic became a story in itself. Further, this specific story gave them a specific position and power to tell other stories.

Seeing Expedition Plastic as a story in itself, highlights how Plastic Change are trying to translate more or less scientific environmental knowledge into a relatable story. To Van Dooren, stories serve as a key element in the way we as humans relate to the world. He explains:

Stories are a part of the world, and so they participate in it's becoming. As a result, telling stories has consequences: one of which is that

³⁴ An English translation would be *Heading for distance shores*

³⁵ <http://realityportalen.dk/rcarticle/wow-kurs-fjerne-kyster-skriver-dansk-tv-historie/> (9.12.2016)

³⁶ The notion of the seven seas has, over time, been used differently. In the modern understanding of the concept, it refers to the seven great oceans.

we will inevitably be drawn into new connections, and with them new accountabilities and obligations. (Van Dooren 2014, 10)

I find this view of stories relevant in my analysis, since it highlights that stories do not differ from how we see the world but that stories are instead part of the world and in our understanding of it. The stories that Plastic Change tell are thereby an important element in their creation of awareness, since it is through these stories that we are drawn into new connections. I will highlight these new connections by turning attention to three different verbal and visual imageries that Plastic Change have borrowed from a more international discourse; an island of trash, an albatross, microbeads in cosmetics, and one story that is based on their own experience; the entangled sea turtle.

Verbal and visual imageries and stories

Many of the stories that Plastic Change use are not of their own making. In order to create a conversation in Denmark, they not only present knowledge of their own making but also draw on verbal and visual imagery that has already been used internationally. In this section, I therefore wish to analyze some of the imagery through which they are trying to reach people and bring into focus where they are borrowing these images from and how they use them in their construction of their own discourse. I start out by focusing on the overall imagery and metaphor of the islands, and will then look at specific photographs, pictures, and narratives and analyze the stories that are told through these.

According to Hannigan, trying to reach people with an environmental issue is best done using evocative verbal and visual imagery. Using the ozone layer as an example, Hannigan shows how the thinning of the ozone layer became a topic of interest when it was referred to as an expanding hole (Hannigan 2005, 70). In 1984, the ozone hole was discovered: a growing hole in the atmosphere's ozone layer, which meant that ultra violet radiation reached the earth. The ozone hole was quickly linked to anthropogenic causes: industrial chlorine and fluorine compounds in aerosols, cooling systems such as those in refrigerators and more. The

discovery led to the realization that colorless gas could affect the energy balance on the Earth's surface. The ozone hole was thereby undeniably anthropogenic. Already three years later, in 1987, a global agreement was made that phased out the ozone-destroying substances³⁷ (Steffen et al. 2011, 842).

The verbal and visual imagery of a hole was easy for many people to relate to. The same can be argued about the visual imagery of an island of trash, which similarly has been used in relation to plastic pollution in the ocean. As I described in chapter 1, Moore and the story of the great pacific garbage patch was exactly that verbal and visual imagery that presented the environmental claim of plastic pollution in the ocean as a problem in the United States.³⁸ It was moreover the imaginary picture of the island that was spread worldwide in the following years and still is a central image of the problem in Denmark. Even though it is a central image, Plastic Change has often highlighted in articles, interviews and on their webpage that there is no such island but that it is a soup of plastic flakes (Plastic Change 2016e). By doing this, they acknowledge the verbal imagery as central in people's understanding of the problem, and by referring to the areas as "soups" they give people another image. Likewise, they turn people's attention to how plastic pollution is much more than just big plastic pieces that have accumulated.

Visual images are similarly important to underline the central imagery (Hannigan 2006, 70). Photos that have been spread worldwide in recent years are the photo series by Chris Jordan from 2009 called *Midway: Message from the Gyre*.³⁹ The photos show the skeleton of a dead Laysan Albatross at Midway Atoll in the middle of the North Pacific Plastic Gyre. The stomach of the Albatrosses is full of plastic pieces, and due to these huge amounts of plastic the albatross is dead from starvation (Photo 3). In the photo, you see a lighter, a part of a comb, and screw caps, together with a range of identified plastic pieces. The photo strongly tells the story of how plastic items that humans have used have ended up in the oceans and of how currents have transported them to the middle of the ocean where albatrosses have then confused them with food. In the last year, Plastic Change have

³⁷ <https://www.information.dk/mofo/plastikplagen> (9.12.2016)

³⁸ http://www.slate.com/articles/health_and_science/the_next_20/2016/09/the_great_pacific_garbage_patch_was_the_myth_we_needed_to_save_our_oceans.html (9.12.2016)

³⁹ <http://www.chrisjordan.com/gallery/midway/#CF000313%2018x24> (9.12.2016)

cooperated with Chris Jordan, and the picture has therefore been widely used by Plastic Change, and at the moment it is on their front page on their international homepage.⁴⁰ By borrowing this image and story from Chris Jordan and an international discourse, they use a picture and story that is known by many people but also a story that they know “works” in order to catch many people’s attention. In some sense, this photo can be seen as their more international logo, just as the NASA satellite picture of the ozone hole over the Antarctic became a “logo” of the problem with industrial chlorine and fluorine compounds (Mazur and Lee 1993, 711 in Hannigan 2006, 79). The visual image of the albatross thereby underlines their central image of plastic pollution in the ocean as a threat to animals. Further, the plastic pieces in the stomach of the albatross are a size where it is still possible to identify many of the plastic pieces as things that we know have served a specific purpose. By having this picture on the international webpage, they address themselves to an international audience that has probably seen these pictures before, thereby making their project identifiable to people outside Denmark.⁴¹



Photo 3 – Front page of Plastic Change’s international homepage – copyright Chris Jordan

⁴⁰ As a collaboration between Chris Jordan and Plastic Change, Chris Jordan attended Expedition Plastic in November 2016 from Los Angeles to Hawaii to finish his upcoming documentary MIDWAY.

⁴¹ The albatross act in some ways as the canaries in the coalmine, warning us of the possible adverse effects of our plastic consumption and that the effects of plastic pollution will eventually strike humans too.



Photo 4 – Front page of Plastic Change’s Danish homepage

On the front page of Plastic Change’s Danish webpage, on the other hand, they have a picture of a woman who is putting on lip-gloss. The picture is supported by the text: “*Sign the EU ban on microplastic in cosmetics and personal care products*” (Photo 4). Microbeads in cosmetics were banned in the US in December 2015, and the law will come into force from July 2017. In Europe and Denmark, microbeads in cosmetics have yet not been banned, but as we see with the text, Plastic Change is trying to push in that direction. They do not only do this using a signature petition, but in October 2016 they also launched the Danish version of the app *Beat the Microbead*,⁴² through which consumers can scan cosmetics to check for microplastic. The photo and text on their Danish webpage represent a particular discourse aimed at a Danish audience around getting a petition signed. By having this particular picture on their Danish webpage, they are trying to show people where plastic is in their own lives. According to Plastic Change, microbeads in cosmetics, in the ocean, and ultimately in our bodies is a bad thing. It is creating ecological problems, which Plastic Change is concerned about. However, since most people in the Danish population have not until recently known that microplastic exists, the picture and text serve as one way of getting people to see where

⁴² <http://plasticchange.dk/vores-loesninger/appen-beat-the-microbead/> (9.12.2016)

plastic is in their own lives. It serves as a way of getting people to see how they are plastic people.

The story of the island of trash, the story of dead albatrosses, and the story about microplastic are closely linked to international discourses on plastic pollution, but the way that Plastic Change reproduce and retell these stories into a Danish context and discourse differs. The story of the albatross is Plastic Change's attempt to get people to see how they are damaging the Earth, while the human face shows one of the more invisible sources of this damage. What the photos show is two different modes of getting people to care, since this is ultimately what Plastic Change's work comes down to: How to get people to care about plastic pollution. The Danish webpage is closely tied to people's individual behavior. It shows one specific source of plastic pollution, and the link between people themselves and plastic pollution is thereby easy for people to make. But it does not say or show anything about how we affect the world, in contrast to the international webpage that shows the damaging effects of our plastic consumption. I see the story of the human face as the way that Plastic Change has felt that they would best be able to reach the Danish population, since seeing the ecological link between a dead albatross and humans might be harder for Danes to do.

From the examples that I have analyzed, Plastic Change has borrowed both verbal and visual imageries and stories from a more international discourse. Likewise, they have been inspired by stories and the way that American and international media and NGOs have told these stories. By borrowing these stories from Moore, 5GYRES, and American and international media in general, Plastic Change built upon an international discourse in the creation of a discourse that is more locally bounded.

The next story that I would like to draw on is not locally bounded in the sense that the experience took place in Denmark, but locally bounded in the sense that it was Plastic Change's own experience and story. On the trip from the Galá-

pagos Islands to Baja California,⁴³ some of the crewmembers saw something faintly in a distance:

“At first sight it just looked like a big lump of plastic, but as we got closer we could see that it was a sea turtle, which was entangled in several hundred meter long line and plastic containers,” tells the skipper on Plastic Change’s expedition. The crew decided instantly to turn around and help the turtle. When they got close enough, they could pull the lump up to the side of the ship. The joy was great when the sea turtle suddenly lifted its head. Nylon cords and fishing line were wrapped around both mitts, neck and hind legs; but with a knife and caution the crew managed to free all the turtle’s limbs, and the joy was great as the sea turtle dived and disappeared into the Pacific. Only once it lifted its head and looked, and then it was gone. “We are obviously pleased that we were able to rescue the sea turtle. But at the same time, we are deeply touched by such a tangible proof of the damage plastic causes among marine animals,” says marine biologist Katarina.

In only a few days, the story had been shared by more than two hundred people and had a few thousand views in total (Appendix 4a). According to the communi-



Photo 5 – The entangled sea turtle (Photo by Plastic Change)

⁴³ I did not participate in this part of the trip. The story is a shortened version of the event based on the story that was uploaded on Facebook, together with pictures of the entangled sea turtle (Photo 5).

cation manager, Natasha, the story was popular. Natasha was previously employed at DanChurchAid, a Danish organization working to assist the world's poorest to lead a life in dignity. In an interview, she expressed how she had experienced that animals and children were easy for people to relate to. They were "likable", and seeing children and animals suffering was touching a lot of people: "*They are vulnerable since they cannot help themselves, in the same way as adults can*", she explained and elaborated:

It is a bit weird, because it [plastic pollution] also affects humans. We just have not seen humans being entangled in plastic. If we could it would also be choking. But when we can show that it affects animals, then it touches people's hearts.

At the heart of this story is thereby a wish to relate to people's emotions by telling a story of an animal suffering.

Even though this story is based on Plastic Change's own experiences and has only been spread in a Danish context, it still draws on international discourses. Internationally, the image of entangled animals in general has been very popular. Pictures and videos of entangled sea turtles and other marine animals have been shared widely online in recent years. One example is a picture of a sea turtle that has grown into a weird shape since it was entangled in a six-pack can holder as a young animal⁴⁴. Due to this already existing trend online, it was and is easy for Plastic Change to tell this story and, via this, reach a lot of people, since the imagery of entangled animals was familiar to people already interested in plastic pollution. By producing stories that take part in an already existing discourse, they know that they will be able to reach a lot of people.

* * *

As I have shown with the verbal and visual imageries that I have just presented, the stories of an island, an albatross that died from ingesting plastic, how cosmetics is a source of microplastic in the environment, and an entangled sea turtle all

⁴⁴ <http://inhabitat.com/peanut-the-story-behind-the-poor-sea-turtle-deformed-by-a-six-pack-ring/> (9.12.2016)

touch upon different aspects of plastic pollution. In particular, the last three stories offer two different modes of making plastic and plastic pollution less alien. The photo of the albatross and the story of the sea turtle show us an animal mode of storying, while the human face shows us a human mode of storying. These two different modes thereby grasp the complexity of plastic pollution in two different ways. Where the human model and mode of storying are closely tied to people's individual behavior, as just shown, and thereby does not need an extra link to reconnect people with the ongoing impacts of their waste, the animal model and mode of storying places greater demands on people and that they are able to make the link between themselves and the animals on their own. Even though the distinction and dichotomy between nature and culture in some sense has collapsed with the paradigm shift of the Anthropocene (Swanson et al. 2015, 150), the storying practices that I have just shown indeed show two different modes of storying that are closely linked with the nature-culture dichotomy. How Plastic Change sees themselves entangled in this nature-culture dichotomy is what the next section will analyse and discuss.

To be or not to be a hippie organization

As I have pointed out with the different stories, Plastic Change is both entangled in a more international discourse while at the same time they take part in the creation of a discourse in Denmark. The stories that they tell take part in the shaping of that discourse, and therefore it is important which stories they choose to tell and which stories they leave out.

As I just analyzed, I found both a human and animal mode of storying present in their work. However, when I first read their vision in my preparations to my fieldwork, I did not see an attention towards other species or a broader concern towards the environment. Instead, I was very surprised by how anthropocentric I found it. In their vision, they among other things state that “*human beings are entitled to live in an environment free of plastic*” and that “*future generations should be able to continue living off marine resources*” (Plastic Change 2016a). This was also made very explicit when Tom opened the conference *Plastic yoU-turn – How to bend the Corvette*

– *NOT to end up with more plastic than fishes in the oceans by 2015?* It was held at Christiansborg, the Danish parliament, in May 2016. He opened the conference with the following lines:

I do not know if you make U-turns with conferences, but I know that you make good discussions with conferences... My sons told me that you cannot leave a world to us where we will swim in plastic.

By drawing his kids into the story about plastic pollution, he thereby frames the story with humans at the center of attention.

In different interviews with employees, I started to inquire into the vision, and Tom's parallel between his sons and future generations became very explicit. They all explained how Tom's awareness of plastic pollution was linked to talks with his sons. At an interview with Simone, a biologist working for Plastic Change in Denmark, I received the following answer when I explained to her that I found the wording of the vision a bit anthropocentric:

If we want to lift this, we also need to capture those who are not nature enthusiast. We have to capture people's attention on something that we can all agree on. An example could be that we would all like to eat fish. If we turn the vision around and argue that we are only doing it for the sake of nature, then we only capture a fraction of the population. A lot of organizations fight with being put in a box named "hippie organization". And when you end there, it is hard to engage people. We would like to engage people and not point derisively at anyone. The box with "hippie organizations" is one that we would like to stay out of.

The interview with her was the first time that I, in relation to Plastic Change, heard the notion "hippie organization", but it was not the last. Carl explained to me how many people in Denmark saw Greenpeace as a "hippie organization" and that it was something that they in Plastic Change tried to distance themselves from. Several of the environmental issues that he had dealt with through his work with Greenpeace had been with nature and species in focus, and these focus areas were too "hippie-like" for many people. A whale species going extinct at the North Pole didn't relate to many people. According to Carl, it was easier to get people to relate to an environmental matter, if it was them, the humans, that were

put at the center of attention. He felt that plastic pollution, as an environmental problem, was able to do this by being very specific and visual. What was Plastic Change's task was therefore not to frighten people away by being "hippie-like" and by focusing too much on the impact that plastic pollution has on ecosystems, different species and so on, but instead to keep it related to people.

However, as we see from the examples of stories, Plastic Change is not excluding stories about animals in their work to communicate and spread knowledge and awareness. On the one hand, Plastic Change do not wish to be part of the same discourse as Greenpeace by having animals and nature as the primary focus of attention, but on the other hand animals are powerful images on the international agenda and are thereby an image that people interested in plastic pollution can easily relate to. I will clarify this point in the following.

Even though Greenpeace was, as I explained in chapter 1, a main inspiration for Expedition Plastic, Plastic Change had according to Carl a wish to distance themselves from Greenpeace's "unpopularity" in the general public, and thereby place themselves within a different discourse than Greenpeace. As Greenpeace are linked by many people with the protection of the environment and the fight to preserve Earth's resources and the natural world in general, it makes them a representation of "nature" in the eyes of many (Connolly 2009). The language and statements that Greenpeace use are thereby seen as meaningful and reasonable to people who relate to the world in the same way as Greenpeace does but are seen as foolish and meaningless for those who do not agree with their arguments. As a counter to "nature" in focus, Plastic Change tries instead to center their focus on humans and thereby in some sense "culture". In the view of Carl and Natasha, by doing so, they are able to get people to relate to plastic pollution in their everyday lives. Plastic in itself has a way of connecting with people better than whales do, since it is present in everyday life. But by placing "culture" and not "nature" at their focus of attention, they thereby prescribe the rules of talking about plastic pollution in a certain way. Through their vision and their focus of attention, they thus try their best not to be entangled in a discourse of "hippie-like" but instead take part in a creation of a discourse which can give most parts of the Danish population, the industry, and politicians a meaningful language with which to talk

about plastic pollution. According to Hannigan, an environmental problem and the way that the problem is framed has to have the widest public resonance and not create divisions (Hannigan 2006, 71). As I see Plastic Change's vision, and their arguments that I have emphasized, they are indeed trying to have the widest public resonance and are therefore very attentive to which stories they choose to tell and use.

* * *

As I have shown so far, knowledge about plastic pollution is being spread to the general population in Denmark with different stories. Plastic Change hopes that these stories can take part in the creating of awareness among people. They hope that verbal and visual imageries can make a difference. This point is also stressed by Anna Tsing who argues: "The choices we make matter. Words make worlds" (Tsing 2014, 3). What she points attention to is that it matters how we tell stories about the world.

With my last examples of storying I wish to show that stories are not only verbal and visual imageries. Stories are also inscribed in the materiality and practices of things (Law 2007). Drawing on Law's notion of a material semiotic (ibid.), in the next section I will analyze the materiality of a story that has played a significant part in Plastic Change spreading of awareness. This story is thus not linked to an animal or human mode of storying but is instead a different kind of story.

The materiality of storying – The knitted dishcloth

Within material semiotics, words are not the only things that matter. Discourse is both material and semiotic. Discourse, in the Foucauldian conception, and material semiotics are thereby closely linked, since both perspectives focus on words

and practices.⁴⁵ What is central in this approach is how words and materials are being woven together. Law highlights: “As Foucault insists, discourses define conditions of possibility, making some ways of ordering webs of relations easier and others difficult or impossible” (Law 2007, 10). Words and materials are, according to Law, thereby not pre-given in their relation to one another, but the discourse defines how they can be woven together and which words and materials count as important. If we take seriously the notion of a material-semiotic discourse, then we cannot just change how we talk about things and change the stories that we tell – we also need to change how we do things. We have to look at the materials and practices that frame or are the discourse (Law 2007; Foucault 1979).

To figure out which specific practices we need to look at, Latour offers some interesting perspectives, even though his project (as we saw in chapter 2) is different from Law’s. He argues:

An idea, even an idea of genius, even an idea that is to save millions of people, never moves of its own accord. It requires a force to fetch it, seize upon it for its own motives, move it, and often transform it. (Latour 1988, 15–16)

The argument is framed differently from Law’s material-semiotic perspective, but Latour highlights that ideas and knowledge never move on their own. Something has to move them and transform them. An important story for Plastic Change, through which words and materials are being interwoven and which has moved and spread awareness about plastic pollution, is the knitted dishcloth. Inspired by the material-semiotic approach, I wish to highlight that the sea turtle might engage people and touch their emotions but it does not necessarily make people less plastic in their everyday life. The dishcloth, on the other hand, might move us some of the way. Within a material-semiotic approach, the dishcloth, that I will now turn our attention to, is not just a dishcloth: it is a discourse in itself. According to the Danish industry association Plastics Industry, it was at least Plastic

⁴⁵ STS’s scholars have been highly inspired by Foucault’s work on practices. In particular, material semiotic authors such as John Law, Marianne Lien, and Donna Haraway (Law and Lien 2010; Law 2007; Haraway 2008; 2015).

Change, “*which got the Danes to run dishcloth-wild with knitting needles and cotton yarn*”.⁴⁶ In the following section, I will analyze and discuss how Plastic Change came to get the Danes to run “dishcloth-wild”.

In the beginning of 2015, Plastic Change and Tom were in the press describing how the disposable dishcloths that many people used over time frees its plastic. It consists of twenty percent plastic, which is rinsed out or released into our environment whenever we use it. For many people, this was new knowledge, but it was also easy to do something about. As Tom expressed it, we should use a cotton dishcloth instead⁴⁷.

The story of disposable dishcloths in pastel shades that release microplastic into the environment spread fast. Whenever I talked to people about my future fieldwork with Plastic Change, and about plastic pollution in general, almost everyone referred and linked plastic pollution to disposable dishcloths and explained how they either had started to knit cotton dishcloths themselves or knew someone who was doing it. This experience was very similar to what many of my informants experienced when they told people that they were volunteering for Plastic Change. They were all met with references to dishcloths. Laura’s mother worked in a second-hand shop and there they had all started to knit dishcloths that they gave as presents or sold in the shop. And the talk about plastic came alive, according to Laura. Natasha described her experiences with the dishcloths in the following way in an interview:

It spreads like ripples in a pond. And they’re all talking about plastic. It [knitted dishcloth] is a fantastic mean of communication. The knitted dishcloth creates a movement of people who talk about the problem of plastic pollution. The dishcloth is brilliant. It’s not because the knitted dishcloths solve a problem. But it creates a very good basis to talk about plastic. Peoples ear’s grew, so they listen more. This means the next time they hear about plastic pollution they will pay attention to it even more, and you can then tell more and more. It’s good to start small. That’s the reason why it is good to start with a dishcloth. It is manageable to most people.

⁴⁶ <http://plast.dk/plast-i-medierne/helsingoer-firma-bag-klude-uden-mikroplast/> (9.12.2016). By the expression “dishcloth-wild” they highlight that a lot of people have started to knit dishcloths.

⁴⁷ <http://www.dr.dk/nyheder/indland/bruger-du-engangsklude-gode-raad-til-et-liv-med-plastik> (9.12.2016)

Natasha had been knitting dishcloths since she started volunteering for Plastic Change, and according to her the knitted dishcloths were a better means of communication than one made of wood fibers than you can buy. The knitted dishcloth, was not just a dishcloth, but was a dishcloth with a personal story, which the one made of wood fibers, did not have. In this way, the disposable dishcloth tells the story of connections between humans, microplastics, and the environment, and so too does the knitted cotton dishcloth. According to Natasha, it tells the story about the absence of microplastic and draws the knitter or the giver of the knitted dishcloth into a world where it can be easy to change one's behavior and to take responsibility for the connections with plastics that we have inattentively been drawn into. The knitted cotton dishcloth comes to bear both a material and semi-otic element (Law 2007). Through its materiality, the dishcloths come to bear semiotics – it comes to bear signs and symbols about a discourse. However, at the same time, it is also a discourse in itself. Both the dishcloth and the words around it are elements of a discourse (Foucault 1979; Hirst 1994, 350).

According to Jonathan, the kind of story and discourse that the knitted dishcloth is can also be dangerous in the sense that it will end up only drawing people's attention to plastic pollution from dishcloths, while they will forget all the other perspectives of plastic pollution. Jonathan argued:

Giving a knitted dishcloth to a friend can of course be part of an evocation of the problem, but sometimes I worry if this way of making plastic pollution so specific will lead to a decoupling from the greater perspective, and if all this knitting a dishcloth in organic cotton will be a form of indulgence.

Jonathan and Sebastian argued that the dishcloth can be seductive and that people easily forget other aspects of plastic pollution such as packaging issues, animal entanglements, and other pollution-related issues. On the other hand, Laura and Katarina advocated the importance of giving people a story in which they could place themselves – that if people could tell the story “*I knit dishcloths*”, then they would also be able to relate better to plastic pollution in general.

When I came home from the expedition in the spring, I was met with dishcloth examples everywhere. I would like to present two of them as examples in

order to put my informant's arguments into perspective. In April 2016, the student department from the Danish Society for Nature Conservation held an event in Aalborg named *Save the world with home-knitted dishcloths* (Appendix 4b). The event was described as a forum for talking about plastic pollution in general, but the name of the event is greatly loaded with the argument: If you change your dishcloths, you make the world a better place. This was also an argument that I discussed with a mother of a friend when we discussed my project in October. The conversation was quickly directed to a discussion about dishcloths. She had started to knit a few herself but explained, with a little indignation in her voice, how some of her friends thought they were saving the world by knitting dishcloths. Jonathan also raised this perspective in the debate at our seminar. From a more sarcastic perspective, he argued that the knitting of dishcloths was nothing more than an “*upper class hipster phenomenon*”, because who really has the money to buy organic cotton and the time to knit dishcloths? Jonathan clearly questioned if knitting and changing dishcloths is a material practice and a material discourse that works in a broader sense. He expressed uncertainty towards whether this kind of story and materiality work and will eventually lead to bigger changes, because does changing the dishcloths also change the big structure of our lives? Does changing your dishcloths actually matter when everything else in our life is still plastic?

At the moment, the dishcloth is the materiality that Plastic Change have primarily chosen to be engaged in,⁴⁸ hoping that the little awareness of changing a little thing in one's life will hopefully change how we see the plastic world around us and within ourselves. According to Plastic Change, the dishcloth might end up framing a discourse that will call for changes:

Homemade dishcloths without microplastic are a hit, and while the needles are red-hot, people are talking about plastic pollution. We enjoy this at Plastic Change, because the more we talk about it the greater is the chance that the responsible listen and hopefully do something before it is too late. (Appendix 4c)

⁴⁸ Plastic Change has gathered 7 words of good advice, to reduce your plastic waste. Changing dishcloth is one of them (Plastic Change 2016f)

Whether or not the knitted dishcloth will change the big plastic structure of our plastic production and consumption, as Plastic Change hopes, or whether it is just trying to put a bandage on a big wound is ambiguous – we will have to wait and see in hindsight.

The spreading of environmental knowledge has not just happened with one story. As I have analyzed in this chapter so far, many different stories have served as a way of spreading knowledge and awareness. How these stories are being woven together into one united story and discourse about plastic pollution is what I will lastly, like to analyze and discuss.

Stories woven together

At the beginning of the expedition, Katarina expressed how she saw the expedition as nothing but a PR stunt (see chapter 2). At that time, being a PR stunt was a bad reference for her. What I will thus argue is that having Christianshavn S/Y and Expedition Plastic as a flagship enabled Plastic Change to bring different things and stories together. It enabled Plastic Change to tell stories that were taken from the sailing ship and into the world. Instead of using a step-by-step approach, where Plastic Change had to produce their “own” data, before being able to tell stories about it and then create a discourse about plastic pollution, Plastic Change was able to tell stories while producing knowledge. They were bringing knowledge from the sailing ship together with other stories, thereby weaving many different aspects and stories together, and giving people in the Danish population a language with which to talk about plastic pollution in the ocean.

Many of the stories that I have presented in this chapter were woven together with the expedition as the basis for storying. The story about the entangled sea turtle and the story about the knitted dishcloths were woven together by posts on Facebook, press releases, on Natasha’s homepage, and by photos. One post on Facebook was a picture of Carl knitting dishcloths, and as the captions said: “*The dishcloth fad has now reached The Pacific, where skipper Carl takes time for a knitting break in the stern*” (Appendix 4d). One day, I was also caught in the weaving of stories myself. Katarina was knitting a dishcloth with red yarn while the trawl was in the

water. Sitting on the opposite side of her, I could see both her knitting a red dishcloth and the trawl in the water. That day, I was weaving a story. It resulted in Photo 6.

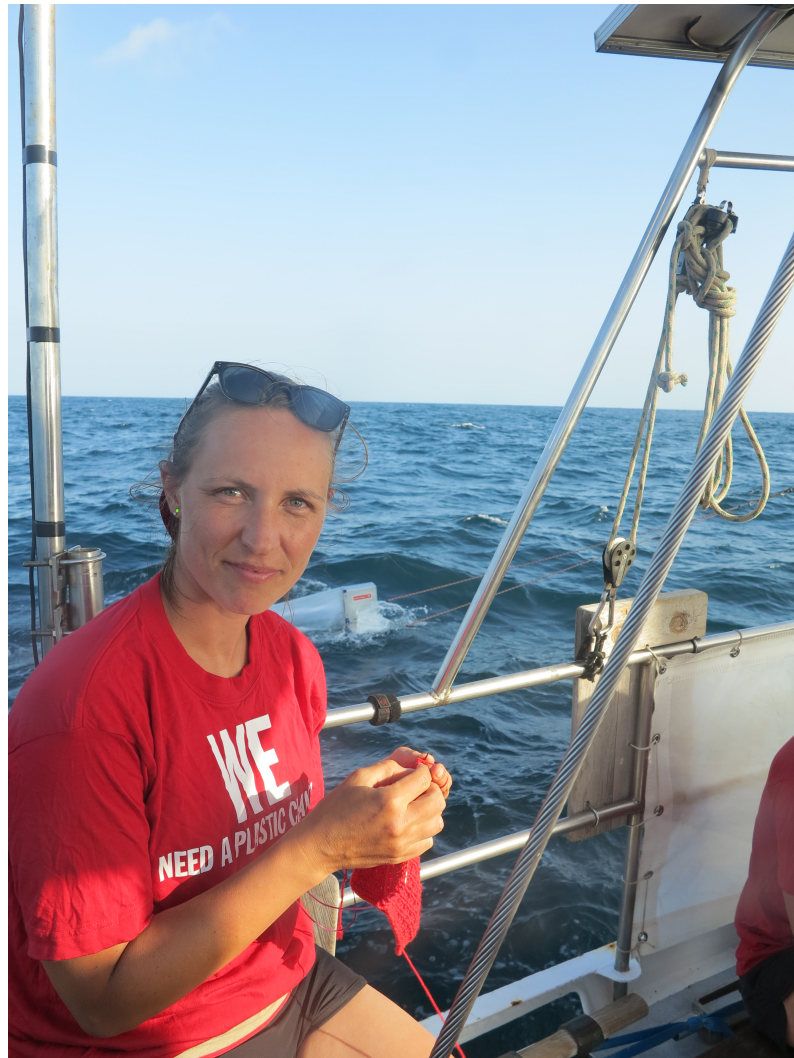


Photo 6 – Knitting red dishcloths while the trawl is in the water
(The photo is used with approval of my informant)

In *Staying with the Trouble*, Donna Haraway (2016), a central scholar within feminism, STS and the Anthropocene argues, that we need to stay with the trouble and stay with the complexity of our world in order to produce more conducive ways of thinking and theorizing that will enable more livable futures. In relation to plastic pollutions, my informants argued that staying with the complexity is not always what creates knowledge and awareness. The stories that Plastic Change told each explored one aspect of plastic pollution in the ocean, and by

only focusing on one aspect they make the alien familiar and identifiable. It is then through the weaving of the stories that the complexity of plastic pollution is made visible.

In the middle section of this chapter, I argued that two modes of storying have mainly been present in Plastic Change's work: the human and the animal mode of storying. However, this chapter has also showed how the different kinds of stories grasp the complexity of plastic pollution in a simple way. In chapter 2, I argued that the sampling on the expedition was not a good practice in terms of creating valuable and valid data but that it instead was part of creating a good and powerful story about the expedition. The story of the voyage, of an island of trash, the dead albatross, microbeads in cosmetics, the entangled sea turtle, the story and the materiality of the dishcloth, and the story of collecting samples in the middle of the Pacific are together grasping some of the complexity of plastic pollution in the ocean.

In an interview, Sebastian drew attention to how the perspectives and the outreach of Plastic Change was not just about telling one story:

Plastic pollution is an environmental problem that cuts across political ideologies. It is colorless, since neither blue nor red block think that plastic belongs in the ocean. Nobody thinks so. But Plastic Change's vision is much more complex and involving than just a scientific vision. We also have a health, a popular, a political and an industrial perspective. Many perspectives are united in an organization like Plastic Change.

What we see from the different stories that I have analyzed in this chapter is how they each tell a different story and thereby capture a different perspective on plastic pollution. Many of the stories are borrowed from an American and international discourse and reframed into a Danish conversation. These stories, images, and materialities have spread the environmental knowledge about plastic pollution and have been and have taken part in the creation of a discourse. By telling "simple" stories and then weaving them together, Plastic Change has been able to catch people's attention.

* * *

Through having analyzed and discussed how plastic pollution is made into and spread as a meaningful and significant environmental problem within the Danish society, I will in this last analytical chapter turn towards questions of caring. I wish to do this because much of Plastic Change's work is interweaved with aspects of care and their wish to change people's plastic behavior and ultimately change political regulations and the industries production of plastics. Ultimately, they wish to change our society from being a plastic society to being a non-plastic society (Plastic Change 2016a).

CHAPTER 4

Caring for the Environment

In this chapter, I wish to explore the complexities of caring. In environmental discussions and conversations, the notion of care has in recent years gained a footing. How to care has become important, since care is not just a simple practice and is often filled with irony and challenges (Van Dooren 2014, 116). In the work of Plastic Change, notions of knowledge and awareness are fundamentally interwoven with their notion of care. A clear statement from Plastic Changes is that they are committed to reversing the current trend of marine plastic waste (Plastic Change 2016a): If we do not act, and change how we use and deal with plastic at this current moment, there will be more plastic waste than fish by weight in 2050 (Plastic Change 2016a, WEF 2016, 14). However, in order for an environmental change to occur, making people care is a key element (Van Dooren and Rose 2016). Making people care and change their behavior has thereby become important for Plastic Change, and as we saw from the different stories through which they were spreading knowledge about plastic, notions of awareness and care were at work.

This chapter aims to examine how Plastic Change and the volunteers did the work of caring at Expedition Plastic and how the visit to the Galápagos Islands made my informants and me reflect on issues of caring. I argue that caring is not a simple practice but that questions of caring have to be addressed within environmental work. Van Dooren emphasizes: “Caring is not achieved through abstract well-wishing, but is an embodied and often fraught, complex, and compromised practice” (Van Dooren 2014, 92). With this quotation as a starting point, caring will be the pivotal point of this chapter. Being interested in more than the behavioral dimension of how caring is practiced,⁴⁹ I am specifically interested in the

⁴⁹ The political interest in social science and humanities scholarship on the environment has tended to find its grounding in behavioral economics and cognitive psychology. A critique has been directed at this tendency, with the argument that a more integrated and conceptually sensitive approach to environmental issues is needed (Rose et al. 2012).

different dimensions in which humans relate to their surrounding environment and how, and if they acknowledge the entanglements in which they take part. In this chapter, I will mainly draw on work about *entanglements*, the way of capturing the webs of interaction between living beings, and *care* from Van Dooren (2014) by putting it into conversation with my own fieldwork experience.

In the first section of this chapter, I will analyze how the crew struggled with practices of caring. I will then turn towards how they experienced practice of caring at the Galápagos Islands, and lastly I will discuss the analysis' result in relation to how caring is not always easy in an Anthropocene world.

Caring in the middle of the Pacific Ocean

The other crewmembers often enlightened me in their new insights about plastic pollution, and by constantly talking about plastic pollution on the ship we slowly had a broader knowledge and awareness. But even though all of us knew more about plastic pollution day by day, it was not always easy to transform that knowledge and awareness into practices of care.

At the slipway in Colombia, the boat hull of Christianshavn S/Y had been treated by the book. It had been cleaned for all microbiological life, and painted with both primer and hull paint several times. The receipts from the painting were carefully saved, so as to show them when we reached the Galápagos Islands. In this case, we had knowledge about microbiological life and awareness about having the cleanest hull possible in order to take the fewest number of organisms into the vulnerable ecosystem. The organization and we as volunteers were thereby doing they best we could to avoid taking damaging organisms in. However, as Jonathan expressed with virtuous indignation in his voice, when I one day asked about the hull painting: "*We are a sailing environmental catastrophe*". One of the following days, I inquired into Jonathan's comment about being an environmental disaster. He explained that he said it to appear cynical in a caricatured way:

My point is, that it is not that different from when we are home. At home, we also do all sorts of things that make us an environmental catastrophe. I just said it to

point it out. The hull painting and the other paintings and chemicals we have used on this ship are slowly being released into the water, thereby polluting wherever we go.

In order to protect the hull of Christianshavn S/Y, which as earlier mentioned was an old steel boat from 1952, it had been painted to protect the hull from fouling of marine organisms and corrosion. Most underwater painting used today on bigger vessels and steel boats consist of polyurethanes. Further, the last varnish is often also polyurethane based. This means that most of the paint is plastic-based.

According to a report from OECD (Organization for Economic Cooperation and Development), there are six key areas from where ships' lose coating. These are: underwater, waterline, topside superstructures, internal spaces and tanks, weather decks, and the loss of equipment (OECD 2009 in Lassen et al. 2015, 129–130). On Christianshavn S/Y, these areas were also areas from which we released microplastic into the ocean. When we arrived at the Galápagos Islands, not much paint had worn off, but after only three months on the ocean, large amounts of paint and coating had worn of, and here and there you could see the green primer that was underneath. There were large patches of a mixture of green primer and rust around the cockpit in particular.⁵⁰

What we can see from Jonathan's own reflection and the following account of the situation is how Jonathan is reflecting on our actions in relation to his knowledge within this topic. He has the knowledge to make himself aware about the entanglements between the ship, marine organisms and animals, and the release of plastic and toxins into the ocean, but changing the behavior regarding hull paint is hard to do.

The loss of equipment, as OECD also highlights and which is more visual and specific than paint, was also a case with Christianshavn S/Y. Living on a vessel, it only takes a few inattentive moments to lose one or two things overboard. A bucket can be lost, as well as cutlery, cups, or other small things. As much as possible was done to ensure that most of the things we used every day did not consist

⁵⁰ I do not know for sure which chemicals and toxic substances were in the paint we used, but being a good transporter for chemicals, the plastic paint that had been worn off, had certainly brought chemicals with it into the sea.

of plastic, but a lot of things are thus difficult to find in other materials. Both a direct and more indirect loss of equipment occurred on the Christianshavn, which I will now show with two field examples:

As Sebastian, on one of the first days at sea, explains the “bucket system” at the mast, he gracefully shows us how to pick up water to rinse the bucket in which we have peed. Even though Jonathan has built a toilet, we would still need to use a bucket at most times. Sebastian smiles and reminds us that we can only use the black bucket to pick up water. His smile gets a bit more crooked: “We have thrown more plastic in the water with the buckets than we have lost, than we have picked up.”

We have set the two new sails. Sebastian is smiling all over his face and is looking fascinated at how they catch the wind – the ship has been in great need for a while. Laura is not smiling. Instead, she is walking around trying to collect the small threads [plastic fibers] that are falling from the new sails. They lay all over the front of the ship, and are one by one being blown in the water if Laura and I are not fast enough to collect them.

Both these examples show how, in some cases, there appeared to be an irony within our expedition. At one point, we were sailing for a cause, we were sailing to save the ocean from plastic pollution, you could even say. But as we see in the examples, we were throwing just as much overboard as we were picking up.

As the section shows, there lies some kind of irony of care in the expedition. In a story about captive breeding of whooping cranes in Florida, Van Dooren shows how competing regimes of care overlap and sometimes come into conflict in the practice of breeding the birds. In his story, notions of caring are at stake, since the care for a species does not necessarily equal care for the individual bird. Aspects of how to tackle the sexual imprinting of the birds and artificial insemination in the form of abdominal massage, asks questions to the *forms of care* that are present in this story (Van Dooren 2014, 87–122). Even though Van Dooren’s story about cranes is much different from my empirical examples, it can be used to look at the competing regimes of care. In both cases, particular ways of caring and particular forms of care are preferred over another. In the case of the cranes, their survival as a species is preferred, and the aspect of care thereby lies in getting the cranes to breed. In case of the expedition, its main purpose was, as earlier men-

tioned, to create awareness about plastic pollution and to contribute to the global dataset about microplastic pollution in areas where samples had not been taken before. The key aspect of care lied therefore in getting people to know that plastic pollution is an environmental problem and that Plastic Change were out there documenting it. In regard to this, new sails that could help the ship to sail better were, in the situation, more interesting and valuable to Sebastian than to reduce the amounts of plastic fibers being released into the water. As this case shows, ideals about not releasing plastic into the ocean were of less importance: Sebastian related to his surrounding environment in a different way when the sails were put up, and the forms of care that were practiced might be seen as a “violent-care” – where the care that is practice is entangled with various forms of “violence”, as Van Dooren puts it (Van Dooren 2014,116).

One day, Simon expressed this very clearly when we were discussing possible solutions to plastic pollution and how and where we could “close the tap”⁵¹. Most of us were sitting in the cockpit, and Simon was standing at the steering wheel and looking into the horizon. He said: *“You could start by asking what the problem is. It is us. And then we can start by removing ourselves.”* The argument that Simon poses is, in the light of the Anthropocene, not completely wrong, since the Anthropocene poses that it is humans who are driving these massive changes that we see around the world. If humans were removed from the planet today, we would at least not be able to produce more plastic and burn more carbon dioxide.

Once again, this puts awareness and forms of care into the spotlight, because even though we want to “close the tap” of plastic, it is not easy to perform care at all. It is hard to put ideals into practice, even for an organization working with plastic pollution. The volunteers and employees in Plastic Change struggle with performing an environmental behavior. And the actions that we see from the field notes shows a strong irony of care within the crew themselves.

Another perspective of caring is proposed by Haraway. She argues: “Caring means becoming subject to the unsettling obligation of curiosity, which requires

⁵¹ This expression is used by Tom, to indicate that we have to stop releasing plastic into the ocean. He uses the picture to describe that plastic is running into the ocean, just like water will keep running out of a tap if we do not close it.

knowing more at the end of the day than at the beginning” (Haraway 2008, 36). According to her, there might be ironies of care and violent care, but as long as we are subjects to the unsettling obligation of plastic pollution, then we are starting some process of caring. My informants might not change everything in their everyday lives and stop being plastic people in a day, but they were getting closer. By coming to understand the problem of plastic in new ways, they had come to have a greater knowledge, a greater awareness, and were step-by-step changing their plastic behavior.

Before I will discuss the notions of care further, I will first consider how the informants reflected upon care on our visit to the Galápagos Islands, and how the islands made them reflect upon issues of awareness and care in new ways.

Caring for the environment at the Galápagos Islands

Situated in the Pacific Ocean about 1000 km from continental Ecuador, the Galápagos archipelago consists of 127 islands, islets, and rocks. In total, 97% of the visible surface was declared a national park in 1959, and in 1978 the Galápagos Islands were recognized as a UNESCO World Heritage Site. The archipelago location at the confluence of three oceanic currents and on three major tectonic plates makes the Galápagos Islands a melting pot of animal life and marine species, which inspired Charles Darwin’s famous theory of evolution by natural selection.⁵²

Framed by the stories we had heard about the Galápagos Islands, the documentaries we had seen, and the guidebooks we had read, we imagined coming to this perfect place which had a unique biodiversity due to its extreme isolation and which was carefully looked after by the political system. These stories were also strengthened by all the restrictions that we had to adhere to in order to access the archipelago by ship. These were, among other restrictions, which food we could bring in, that we sorted our waste and had a clear marking of how we sorted it, and most importantly that the hull of the ship was newly fixed and painted, so that

⁵² <http://whc.unesco.org/en/list/1> (9.12.2016)

we would bring in the least number of microbiological organisms. We imagined the Galápagos Islands as this amazing place that few of us had never imagined that we could visit. Before we arrived, we were not in doubt that the Galápagos Islands were *cared for*, as you can see in the field note.

In the hours that we are getting closer to San Cristobal, we talk about the restrictions we have met arriving by ship to the Galápagos Islands. "It is great that, after all, care is being taken of such a unique place," Laura says. We talk about the different species and plants, and even though many species have been introduced accidentally or intentionally, we come to the shared understanding that they are at least making an effort to protect what they have.

What Laura and the rest of us had expected to meet was that the well-wishing attempt to protect the archipelago was also a well-performed practice. However, she came to the understanding that the care she expected to meet was not the care that she met. Only days after our arrival, our utopian understanding of the Galápagos Islands was tarnished, and after two weeks in the archipelago, not much of this story or picture was left in us. Just as we ourselves struggled with the performance of care, so too was the case at the Galápagos Islands – at least, if we focus on plastic pollution, which our eyes and minds had been shaped by these last months.

After meetings with a marine biologist at the university who had just recently started research about plastic pollution at the Galápagos Islands, talks with locals, and our own experience, we came to realize that the picture of the archipelago was not as idyllic as we had imagined. Even though we had the impression that the government and the administration of the national park were doing the best they could, with signs guiding to waste sorting, signs saying that one could not throw waste overboard from the small ships that were sailing between the islands, and having restricted areas where we could eat within the national park so tourists would not throw plastic everywhere, we also experienced a different perspective. At the small ferries between the islands, we were handed a "throw up plastic bag", we talked to a guy who freed a sea lion from a plastic band and experienced that their small ferries killed or at least harmed manta rays that they had sailed into on the surface, and many other stories. Political regulations, the relation between an

issued resolution and practice, human behavior and plastic pollution coming from both the Galápagos Islands itself, and through currents from South and Middle America thus blurred our image of the Galápagos Islands.

At our visit to the islands, my informants were confronted at all times with how humans impacted the environment. Both visual and less visual entanglements were acknowledged, and awareness about aspects of caring and the difficulty of putting ideals into practice became very visible. We came to realize that not only in our own life and in the life of the expedition but also in the life of a more fragile environment, we were faced with how hard, fraught, and complex caring for others actually is. The complexity of caring, I wish to discuss further, with point of departure in a concrete example from the Galápagos Islands.

After a road trip around the island of San Cristobal, we meet Laura at a small beach. She is walking around and collecting things from the sand. As we get closer I can see that she is collecting plastic pieces. She shows me her hands. "This is what I have collected in 3-5 minutes." Coming from the other side of the island where the beach was filled with smaller pieces, microplastic, these pieces seem bigger. A small fence made of green string (plastic string I notice instantly – my eyes have been sharpened) separate the sandy beach from the bushy area. A sign has been put up. BE AWARE! SEA TURTLE AND MARINE IGUANA NESTING SITES it says (Photo 7). I cannot stop thinking about the irony in that sign. We cannot interfere with the marine iguana by walking around in their nesting area, but instead we have spread plastic waste all over their habitat. Potentially, that has a much greater impact than if we just walked around in there.

What we see in the field note is how one specific mode of caring is brought to our attention. The mode of caring that is promoted with the sign and string is that we stay away from the sea turtle and marine iguanas nesting site in order for them to nest without human interference. However, the sign does not promote other forms of caring than just this one mode, and is this one mode of caring enough to not interfere? I will argue no. What can be seen as ironic is that we, through plastic pollution, might interfere much more with their nesting practices and their outcome than if we just walked around in the area. Endocrine disruptors and carcinogenic chemicals attach to plastic particles, and the plastics that Laura and I picked up on the beach might have more harmful consequences than we know of.



Photo 7 – I am sitting in front of the sign with some of the plastic pieces Laura and I found at the beach.

The sign does not inform us of other kinds of awareness that we also need to enact caring. It does not tell us about the effects of our plastic pollution. We can choose to stay away from the nesting site and enact caring in that respect, but whether or not we participate in the production of more plastics in the world is a lot harder. It is easy to stay away from the sea turtles and iguanas, but it is difficult to stop using plastics, since they are in every corner of our lives. As individuals, we can change our plastic behavior, but we cannot detach completely from the plastic consumption that is in the world today. But how do we then try to do the caring that involves bigger structural changes? To answer this question, let us return to the buckets and the plastic fibers that were lost overboard on Christianshavn S/Y.

Caring in an Anthropocene world

Even if we have an awareness about plastic pollution, can we then enact caring? Caring is, as we have seen, not always easy. It is challenging, it is compromised,

and it is dirty. Haraway notes: “The point is to make difference in the world, to cast our lot for some ways of life and not others. To do that, one must be in the action, be finite and dirty, not transcendent and clean” (Haraway 2003, 236). In the case of Plastic Change, this means that they needed to be out there, where the plastic pollution is and sometimes that type of caring also involves dropping buckets overboard.

In environmental work, caring is a general dilemma, since it often involves meetings, conferences, promotion, and more. As Connie Hedegaard, a former EU commissioner and Danish environmental minister, replied when she was asked at the talk “Climate changes as a social challenge”⁵³ how she could justify having such a huge carbon footprint when she fought for minimizing humans’ carbon print and humans’ effects on the environment, then she believed that flying around the world promoting action in the long run had a much greater impact on reducing the carbon print in the world than if she just stayed at home. What she thereby drew attention to is that sometimes you have to fly all around the world to reduce the carbon print of the world, and as a parallel, sometimes you have to lose a bucket overboard to save the oceans from plastic.

By analysing and discussion the notion of care I have wished to highlight the complexity of caring, as a perspective of my analysis of Plastic Changes work. Caring in an Anthropocene world is not an easy practice, but questions of caring have to be addressed if we hope to create a more livable future for the coming generations and more than human life (Van Dooren and Rose 2016; Van Dooren 2014, 116). As we have seen in this chapter, knowledge and awareness do not always lead to changes in behavior and politics, and does not necessarily lead to new and maybe better forms of care. Caring is not a simple practice. But as we also saw, the Galápagos Islands were a place where my and my informant’s knowledge and consciousness were sharpened, where forms of care were brought to their attention. We became aware of things we would not be aware of in our everyday lives. This meeting and experience draw attention to the fact that care is not static, but that care can be negotiated. As an inspiration text for their exhibition at *Den blå*

⁵³ The talk was held in Aalborg, 27 October 2016.

planet, Northern Europe's largest aquarium, based in Copenhagen, Plastic Change write: "*No one can do everything but everyone can do something*".⁵⁴ By this statement, Plastic Change spread the perspective that if we use our updated knowledge and awareness about plastic pollution and step-by-step become a little bit more aware of who we are as plastic people in an Anthropocene world, then we might in the future make a more liveable world with less plastic.

⁵⁴ <http://plasticchange.dk/vores-formidling/udstilling/> (9.12.2016)

CONCLUSION

When currents meet the shoreline

As I mentioned in the introduction, I have used currents as an element for thinking and theorizing throughout this thesis process because I see environmental knowledge and awareness as spreading in a similar way to how plastics are being spread with ocean currents. I therefore wish to draw further attention to currents: both oceanic currents and as social currents of knowledge and awareness, and to direct attention to the idea that it is when ocean currents meet the shoreline that we are truly faced with the effects of our plastic world.

At the end of November 2016, Christianshavn S/Y and Expedition Plastic reached their final goal: the great Pacific garbage patch and Hawaii.⁵⁵ This is the place in the world where attention to plastic pollution in the ocean started and a place where massive amounts of plastic and microplastic can be seen. At Kamilo beach⁵⁶ on the southeast coast of the island of Hawaii, the expedition experienced the most alarming amounts of microplastic pollution any of the crew had ever seen. Videos were posted on Plastic Change's own Facebook page and on DR showing how the shoreline was full of plastic particles (Appendix 4e). These videos once again placed Plastic Change and plastic pollution in a loop of attention and were seen and shared to a wide extent. As we saw in the prologue, it was also at the shoreline of the Galápagos Islands that I realized that Plastic Change's work was not insignificant. When we saw the shoreline of the archipelago, we were faced with how big this problem really is. As Van Dooren writes: "There is something remarkable about shorelines, a place where water meets land and give rise to a sense of productive confusion between two worlds" (Van Dooren 2014, 63). When ocean meets land, at the shoreline, we were forced to fully encounter the problem of plastic pollution. Land breaks the water's movement of plastic, and the

⁵⁵<http://www.dr.dk/nyheder/viden/miljoe/plastiksuppe-faar-miljoe-ngo-til-efterlyse-pant-paa-plastik> (9.12.2016)

⁵⁶ The beach is known for its accumulation of plastic, due to constant trade winds and converging ocean currents.

plastic pieces accumulate at the shoreline in their largest quantities. The quantity of plastic at Kamilo beach is large, but due to currents it is also where the problem become visible to people, who mostly live on land.

At the shoreline at San Cristobal, the Galápagos Islands, a productive confusion arose for me that I described in the prologue, and a similar confusion might have arisen in some parts of the Danish population based on the videos and pictures from Kamilo beach. It asks questions of nature and culture dichotomies, of landscapes and oceanscape, and to what extreme extent human behavior has affected this planet.

Currents move constantly. They are driven by wind and modulated by the planet's rotation. Currents circulate and have upper and lower currents that move differently and move plastic in different ways. Temperature, saltiness, and tide affect the currents (NOAA 2016; Lassen et al. 2015, 66). In the last sixty years, ocean currents have transported plastic around in our environment. When the currents of awareness about plastic pollution hit Denmark, Plastic Change was the first to spread that awareness. How Plastic Change have spread knowledge, awareness, stories, and practices of caring is what this thesis has aimed to show.

Thinking about awareness in this way matters, since the globalized world and the human and environmental challenges we face ask us to pay attention to sociality, human relations to their environment, and human relations to non-human agents in completely new ways (Helmreich 2009; Helmreich 2011). The spreading of plastic pollution can be compared with the spreading of environmental awareness. Currents do not take all plastics to one place or degrade it in a specific way. The flow of plastic is not constant. Just like the amount of plastic pollution in the ocean is not the same in every part of the ocean but accumulates in specific zones, so too is the awareness of plastic pollution not the same everywhere on the planet. Thinking with watery metaphors allows us to see environmental awareness and the spreading of it in new ways, and by paying attention to the speed at which the oceanscape changes, we are drawn into new kinds of entanglements, new kinds of awareness, and new kinds of responsibilities.

* * *

This project contributes to both method and theory in environmental anthropology by looking at the processes and practices of an NGO. These processes, whereby Plastic Change have translated knowledge to relatable stories, highlight the active role of human agency in the existence of a phenomenon (Latour 2014, 2). As Sebastian argued in an interview:

You may not point out that no attention would have been drawn towards plastic pollution if it was not for Plastic Change, but there is no doubt that in the time Plastic Change has existed, plastic pollution has become a much more relevant problem in Denmark.

If it had not been for Tom, Carl, the employees, and the volunteers at Plastic Change, plastic pollution might not be a relevant environmental problem in the Danish population – or at least not in the same way it currently is.

What my method and the analysis have shown is the importance of not just looking at phenomena and the work of NGOs superficially, but that we need to follow the processes and practices all the way to the ocean to truly understand them. The construction and making of plastic pollution as an environmental problem, as I analyzed and discussed in Chapter 2, are processes that are invisible to most people, while the spreading and communication of the problem, as I analyzed and discussed in Chapter 3, are more visible to everyone. Through both the more visible and invisible processes and practices, Plastic Change has been able to make the alienness of plastic pollution into an identifiable environmental problem. As the Anthropocene calls for new perspectives on human relations to their surrounding environment, my analysis offers new theoretical perspectives to how we understand environmental problems and which tools, concepts, and ideas we need to look at new environmental movements with.

This project matters not only for scholars but also for environmental groups who are interested in thinking critically about how to spur environmental awareness and changes in policymaking and behavior. Earlier awareness about environmental problems has often been closely tied to scientific findings and claims (Yearley 1992, 117 in Hannigan 2006, 63), but as this thesis has shown, the con-

struction of plastic pollution as an environmental problem within the Danish society did not come from science itself but came as a result of the work of Plastic Change. I discussed with Sebastian what Plastic Change had done that scientific researchers had not been able to do. He had also discussed this with the researcher Kristian Syberg, their main allied researcher. Sebastian argued:

To Kristian it is wildly frustrating to work with an environmental problem that is as relevant as plastic pollution is in society and for people in general. But those who already know the problem are the only ones who read his research articles, and then it becomes a scientific problem and an analytical problem more than a real environmental problem that has to be dealt with. What is important is that someone takes his research and argues that it is not just statistics and data. That it is a real problem! It is a real environmental problem that has far-reaching consequences for nature and ultimately ourselves.

What Sebastian sees as an important task is to make statistics and data identifiable to people. The analysis that I have made of Plastic Change shows how NGO groups must translate environmental knowledge to simple stories in order for them to reach people and spread their message. Not that the complexity of the problem should be minimized, but that the complexity instead should happen through the weaving of stories. The processes of translation are therefore important, and how and which knowledge they translate matters for the kind of futures that they wish to frame. The thesis thus also shows the challenges that Plastic Change face, such as issues of funding. Further, it highlights that the work of an environmental organization never starts from neutral ground, but that in order to reach people they have to both navigate in the discourse about environmental problems which is already embedded in the population, while at the same time navigate in the already existing discourse about the problem in the international arena. It highlights the importance of knowing the population to which they speak.

Further, with this thesis, I have shown how it is possible to do an ethnographic project on oceans and plastic in a field that has long been focused on land. Oceans are an important part of human lives, and to understand human sociality we need to overcome the bias in our thinking and the way we practice anthropology. We need to extend our ethnography beyond the shoreline, into the oceans where people have trouble going and seeing. For both environmental understand-

ing of plastics and for anthropological research, our thinking can start at the shoreline where the two worlds meet, but it cannot end there. My research started the other way around. I started on the ocean, but it was at the shoreline where I realized that we as anthropologists need to learn much more about oceans to be able to understand the relations between humans and our surrounding environment. We need to turn our attention towards oceans and think with oceanic metaphors to fully understand the complexities of the Anthropocene world.

ABSTRACT

Strømninger af plastik bevidsthed: Et antropologisk studie af en NGOs arbejde for at skabe viden og opmærksomhed om plastik forurening i havene.

Baseret på et feltarbejde ved miljøorganisationen Plastic Change i foråret 2016 undersøger jeg i dette speciale, hvordan plastikforurening bliver skabt og spredt som et meningsfyldt og vigtigt miljøproblem, og hvordan viden om plastikforurening i havene bliver produceret og kommunikeret til den danske befolkning af Plastic Change. Organisation blev grundlagt i april 2014, og har siden været en altafgørende aktør i Danmark i skabelsen af opmærksomhed omkring plastikforurening.

Plastik der første gang blev produceret industrielt efter 2. Verdenskrig, er igennem de sidste 60 år blevet en mere og mere uadskillelig del af det menneskelige liv. I dag er der plastik overalt omkring os, og den plastikforureningen der ses i verdenshavene er et resultat af et kraftigt stigende forbrug, at plastik er et materiale der aldrig bliver biologisk nedbrudt og mangel på måder at håndtere plastik affald på.

Specialets formål er at vise, hvordan plastik og mikroplast i havene, gennem Plastic Changes arbejde, er blevet et vigtigt miljøproblem hos både den danske befolkning, industrien og politikere. Analytisk er specialet inspireret af *science, technology and society studies* (STS), der baseret på en social konstruktivistisk tilgang fokuserer på relationer mellem mennesker, ting, viden, teknologi og organisationer, og hvad der skabes i disse relationer. Da jeg netop forsøger at afdække, hvordan plastik forurening i havene er blevet og bliver skabt og spredt som et miljøproblem, har STS tilgangen og teoretikere som Bruno Latour og John Law været væsentlig, da de fokuserer på processer og praksisser hvorigennem viden og ting bliver skabt.

Mit primære fokus igennem både feltarbejdet og specialet er *Ekspedition Plastik*; det første projekt som Plastic Change søsatte. Igennem en analyse af hvordan processer som fundraising, praktiske problemer, prøvetagning og det at være vidne til forskning og plastikforurening i verdenshavene, undersøger jeg, hvordan viden omkring plastikforurening bliver skabt. Derudover undersøger jeg, hvordan Plastic

Change skaber og fortæller forholdsvis enkle historier og billeder, der tilsammen er med til at skabe en mere kompleks historie og diskurs om plastikforurening hos den danske befolkning. Mange af disse historier og billeder er baseret på allerede eksisterende historier, der er blevet brugt internationalt, samtidig med at Plastic Change også fortæller egne historier. I den sidste del af specialet analyserer og diskuterer jeg de udfordringer, der er med omsorg og beskyttelse i en miljømæssig kontekst, og hvordan det at vise omsorg for vores miljø ikke altid er så simpelt som vi tror.

Med introduktionen af den Antropocæne tidsalder, et begreb der søger at forstå den nuværende periode i jordens historie, hvor mennesket er blevet en geologisk kraft, kan antropologien bidrage med viden om menneskets relationer til vores omgivende miljø. Specialet placerer sig dermed i et antropcænt antropologisk felt, ved netop at fokusere på plastikforurening, en miljøproblematik som er blevet en geologisk indikator for menneskers liv på jorden og som sætter spørgsmålstegn ved natur og kulturforståelser. Inspireret af marineantropolog Stefan Helmreich argumenterer jeg i mit speciale for, at den måde hvorpå miljøviden og bevidsthed bliver spredt på kan sammenlignes med den måde hvorpå plastik bliver spredt på af havstrømme. Ved at tænke med vandlige metafore, bliver vi i stand til at se miljøbevidsthed og den måde det spredes på på nye måder.

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APPENDIX



iGYRE

PROTOCOL FOR SAMPLE COLLECTION AND SAMPLE ANALYSIS USING THE MINI HIGH SPEED TRAWL

SAMPLE COLLECTION

The 5 Gyres Institute's citizen science program iGyre aims to collect microplastic pollution data in oceans and lakes around the world. The program empowers volunteers to collect important information that will be used to monitor global and regional trends in plastic pollution.

The first step is to contact 5 Gyres (info@5gyres.org) to talk with our staff and then register your vessel and arrange to be sent the mini high-speed trawl.

MATERIALS PROVIDED:

- Mini High Speed Trawl
- Cod end + two hose clamps
- Ruler
- 1mm sieve
- Magnifying glass
- Data sheets

OTHER MATERIAL NEEDED:

- Spoon
- Squirt bottle
- Tweezers
- Graph paper
- Digital camera



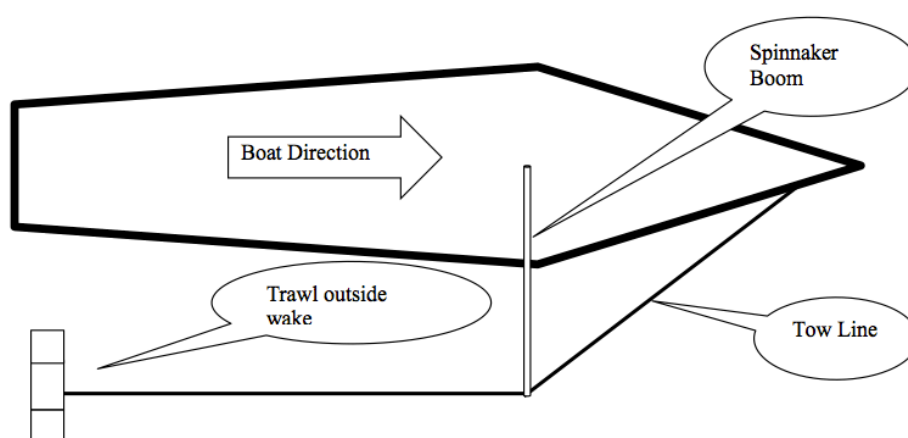
Mini High Speed Trawl.

TRAWL ASSEMBLY – The mini high speed trawl will arrive with easy assembly; you only need to unfold it and secure it with the provided pin. You will also need to attach the cod end to the end of the netting with two hose clamps on each end. Make sure all fasteners are tight. Attach the bridle and you're ready to go!

DATA RECORDING - Record all information for “Start/stop data” and “Sea and Boat Conditions” at deploiment and recovery of each trawl. Identify each trawl with a unique sample number that goes on the sample and data sheet. Sea State, Boat Speed, Boat Direction, Wind Direction, and Wind Speed will be recorded at deploymet and recovery. If possible, use the onboard knot meter to determine boat speed.

START DATA	Trawl#	TIME start	Lat(N) start		Long(W) start		
STOP DATA	Date	TIME end	Lat(N) end		Long(W) end		
SEA and BOAT CONDITIONS	Start Sea State / End Sea State	Start Speed / End Speed	Start Direction/ End Direction	Average Boat Speed	Start Wind Direction / End Wind Direction	Start Wind Speed / End Wind Speed	Flowmeter (if available)
							Start
							Stop

DEPLOYMENT - Deploy the trawl out of the wake zone. Turbulence inside the wake zone does not allow for a representative surface sample to be collected. You may wish to use a spinnaker pole or a davit to position the trawl tow line away from the side of the boat. Watch the net while you trawl to observe its performance and adjust the length of the tow line and vessel speed if it's bouncing along the surface.



Beaufort Scale of Sea State		
Beaufort Force 0-12	Wind Speed	Sea Criterion
Force 0	Less than 1 knot	Sea like a mirror
Force 1	1-3kt	Ripples with the appearance of scales are formed, but without crests.
Force 2	4-6kt	Small wavelets, still short, but more pronounced – crests have a glassy appearance and do not break.
Force 3	7-10kt	Large wavelets. Crests begin to break. Foam of a glassy appearance. Perhaps scattered small white caps.
Force 4	11-16kt	Small waves, becoming longer, fairly frequent small white caps.
Force 5	17-21kt	Moderate waves taking a more pronounced long form, many small white caps are formed. Chance of some spray.
NO MORE TRAWLING Force 6	22-27kt	Large waves begin to form; the white foam crests are more extensive everywhere. Probably some spray.

TRAWL SPEED/DIRECTION – Maintain a steady linear course (you do not want the tow line to come under the vessel). If the trawl is leaping out of the water or plowing under a wave, then you're going too fast. Watch the trawl and adjust accordingly. Remember not to trawl in Sea State 4 or above. You need to watch the sea state and recover the trawl if winds are above 16 knots.

TRAWL DURATION – The mini high speed trawl should be delayed for 4-10-hours, with frequent checking visually for the trawl performance, entanglement with large debris, quantity of debris, and security of the securing lines. You want to avoid letting the cod end on the back of the trawl fill with zooplankton, which can happen when trawling at dusk when zooplankton migrate to the surface.

RECOVER TRAWL - Recover and secure trawl on boat. Record STOP DATA immediately. It is very important to record the most accurate latitude and longitude.

STOP DATA	Date	TIME end	Lat(N) end	Long(W) end

SAMPLE ANALYSIS

MATERIALS YOU WILL NEED:

1mm sieve, spoon, and toothbrush.

Tweezers and a fresh water wash bottle full of water to wash plankton off of plastic as you separate items from each other.

Handheld magnifying glass.

Ruler and graph paper.

Digital camera.

Data sheets to record all information.

Envelope to send sample to 5 Gyres Institute.

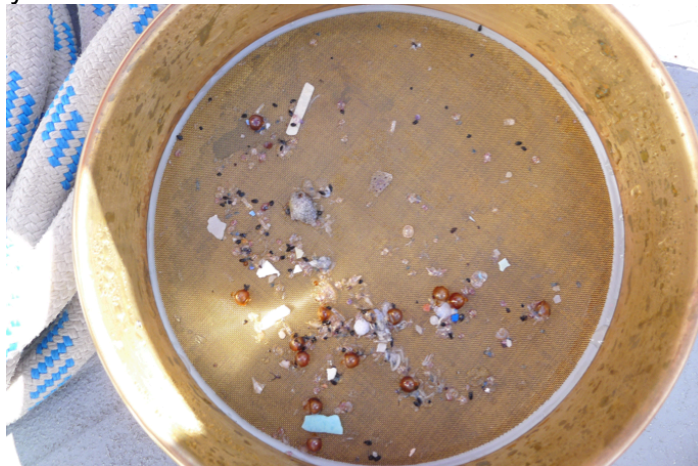
MATERIALS FOR SAMPLE STORING

Multiple copies of graph paper

Envelopes for storing each sample

SAMPLE PREPARATION

1. Drain sample through the provided 1mm sieve (Optional: You can opt to rinse cod and into bucket or bowl prior to placing in sieve)
2. Use fresh water wash bottle and toothbrush to rinse and brush plastic particles adhering to the cod end.
3. Pour sample through sieve and rinse equipment gently with the wash bottle so that no plastic particles are left in the cod end.
4. All plastic pollution and other materials should be in the 1mm sieve and ready for analyses.



SAMPLE SORTING

5. Use tweezers to remove all recognizable pieces of plastic from the 1mm sieve, and transfer all plastic materials directly into a glass bowl or jar, or onto provided graph paper.
6. Use the hand held magnifying glass to look closely at the surface of the material to help you make sure the material is plastic.

7. Lay all plastic pieces on graph paper (if possible, let it dry someplace undisturbed). Using the ruler or lines on the graph paper, separate plastic pieces into size and type categories:
 - a. Category one - (particles >5mm), (particles <5mm)
 - b. Category two – (Fragment, Film, Foam, Pellet, Line)
8. Photograph the sample!
9. Count number of plastics for each category and record on data sheet.
10. If available, prepare scale for weighing sample. Tare the scale with the container you are using. Take weight in grams. Record weight, next to the count, on the data sheet.
11. Don't forget to photograph the sample! This is a very important step for later shape, size, color & type identification.

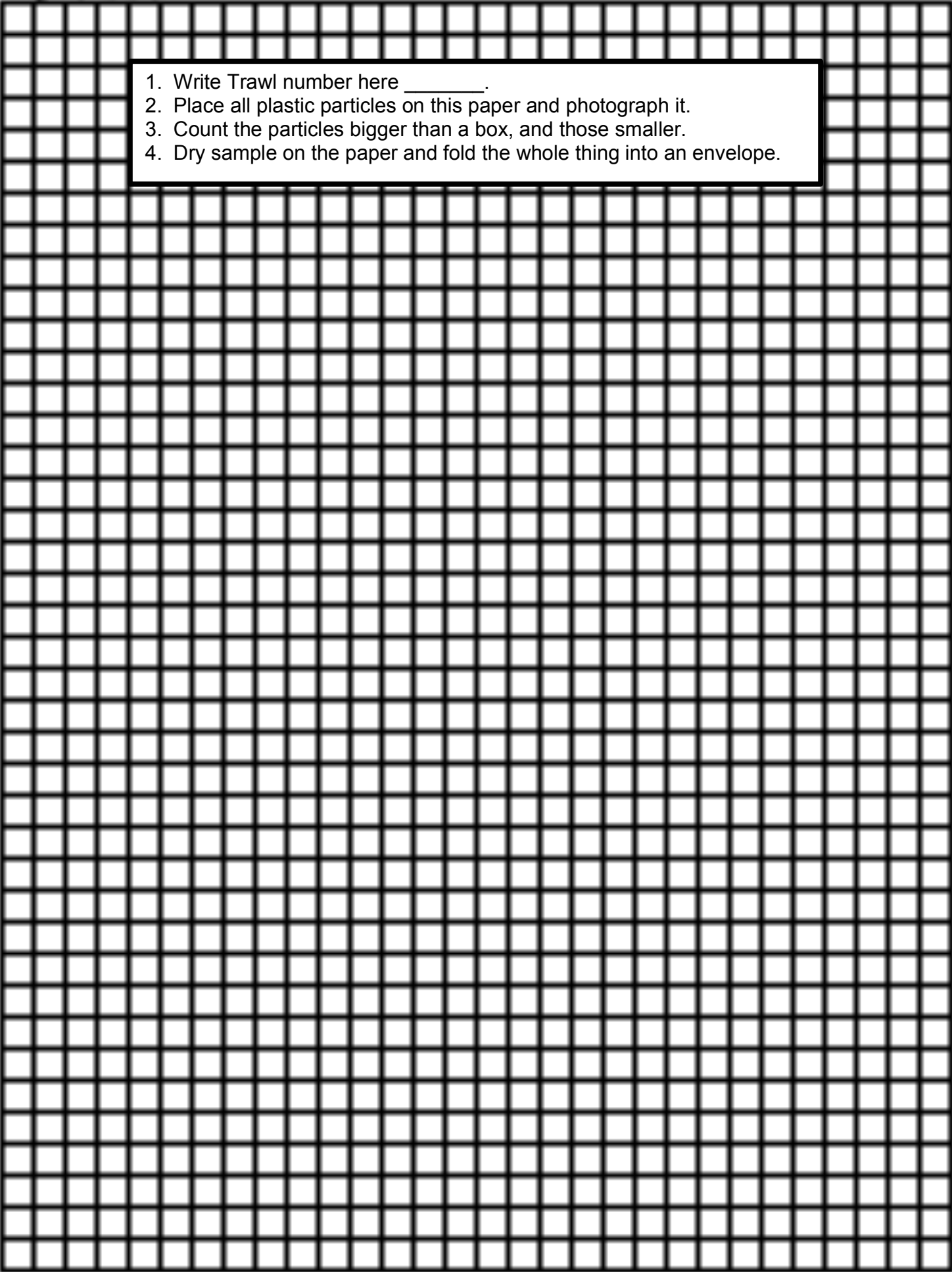
STORING AND SENDING DATA

12. Keep all samples separate, and number all samples and data sheets. Dry everything.
13. Email the following information to the 5 Gyres Institute (marcus@5gyres.org)
 - a. Send photos of plastic pieces on graph paper (for each sample)
 - b. Send photograph of all data sheets (for each sample).
 - c. Send other interesting photographs of trawl deployment, boat, recovery, and other interesting photos.
14. Mail data sheet and plastic pieces to 5 Gyres
 - a. Please make sure you include your contact information at the top of the data sheets. We definitely want to keep in touch in case we have questions and to send you a HUGE THANKS!
 - b. For multiple samples, list each sample, including location data, and organize by sample numbers.
 - c. For each sample, fold up graph paper around the plastic pieces and put everything in the envelope provided. However, it is very important to keep the samples separate if there are more than one sample. You will need multiple envelopes.
 - d. Send completed data sheets and plastic material to:
Marcus Eriksen, PhD
2122 S. Spaulding Ave.
Los Angeles, CA 90016
marcus@5gyres.org
323-395-1843

SAMPLE COLLECTION AND ANALYSIS DATA SHEET

Trawl #	Vessel Name			Location			Date			
	Contact Name			Phone #			Email			
START DATA	TIME start		Lat(N) start				Long(W) start			
STOP DATA	TIME end		Lat(N) end				Long(W) end			
Sea State		Current Speed		Current Direction		Distance by knot meter		Wind Speed		
Sample #	Fragment		Pellet		Line		Thin Film		Foam	
	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.
<5mm										
>5mm										

Trawl #	Vessel Name			Location			Date			
	Contact Name			Phone #			Email			
START DATA	TIME start		Lat(N) start				Long(W) start			
STOP DATA	TIME end		Lat(N) end				Long(W) end			
Sea State		Current Speed		Current Direction		Distance by knot meter		Wind Speed		
Sample #	Fragment		Pellet		Line		Thin Film		Foam	
	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.	Ct.	Wt.
<5mm										
>5mm										

- 
1. Write Trawl number here _____.
 2. Place all plastic particles on this paper and photograph it.
 3. Count the particles bigger than a box, and those smaller.
 4. Dry sample on the paper and fold the whole thing into an envelope.

Appendix 2

13.1.2 Sample collection at the boat

13.1.2.1 Sample preparation

- Pre-bake 100-300 mL brown amber glassware; All glassware is baked at 550 °C for 2 h to remove organic contamination.
- The lids are rinsed in acetone and coded with aluminum foil to avoid contact between the samples and the plastic lids.
- Put markers on the glasses.
- Bring pen to write on the glasses with destination and sample.
- Rinse the tweezers in acetone.
- Rilsan bags with zip tie.
- Tube with 4 different exchangeable filters.
- 2 types of wire brush rinsed with acetone to rinse filters.
- Paintbrushes made of natural hair rinsed in acetone to rinse filters.
- Atomizer washed in demineralized water.
- Funnels pre-baked at 550 °C for 2 h to remove organic contamination.

Examples on the equipment can be seen in, **Figure 1**.



Figure 1: Rinsed equipment before the expedition.

13.1.2.2 Sample protocol

Samples are collected in accordance with the 5gyres protocol. Here the Manta trawl is used and data such as speed, distance and time is recorded.

The Manta trawl is used for approximately 4-6h duration. After the samples are brought onboard, the particles are handled as follows;

- Transfer the sample to a box
- Add water until the sample is covered
- Mix the water with the sea weed to release possible plastic particles
- Drain water and particles through the sieves
- Repeat this procedure 5 times

- Release the adhering particles in the cod end by spraying with a wash bottle containing seawater.
- Three subsamples are marked depending on sieve size; 0.3-1, 1-5 and above 5.
- The samples are transferred from the sieve to the correct glass by using tweezers to remove all recognizable pieces of plastic.
- The particles in the smaller sieves are transferred with other material because it was not possible to separate the plastic from the organic matter on the boat.
- In the end the sieves are rinsed by staying seawater and using natural hair brushes to release possible additional particles. These are transferred to the three subsamples as well.
- All glasses are covered with aluminum foil to protect contact with the plastic lid.
- In the 5gyres protocol further analysis of the particles on graph paper to categorize the particles – if possible these steps should be performed in the laboratory afterwards or very carefully with only rinsed tweezers or specific gloves:
 - Categorize the particles after size; 0.3 -5 mm.
 - Categorize the particles after type; fragment, film, foam, pellet, line
 - Photograph the sample for color identification.
 - Weigh the sample

Appendix 3

Uncertainties that Hanna and Katarina identified as being present at the trawl on 16 February 2016:

- Emptying of the drain
- The trawl was being taken up and down
- The direction was not stable
- A lot of phytoplankton in the water
- Cray fish in the samples
- White painting from the ship
- 5 hours in the water
- The rope that holds the trawl is made of nylon (plastic)
- Leak in the pontoon. A lot of water fills the pontoon and thereby there is more weight in one side of the trawl than the other.
- The trawl dives a lot (this means that the united amount of water is not accurate, and the calculation will thereby be accurate as well)

Appendix 4a

To give my informant's some anonymity, even though it is not full anonymity, I have chosen to cross out names and dates.



Plastic Change
@plasticchange

Startside

Om

Billeder

Videoer

Begivenheder

Synes godt om


Opslag

Opret en side

Synes godt om ▼ Følger ▼ Del ... Mere ▼

 Plastic Change har tilføjet 2 nye billeder — sammen med 

Havskildpadde reddet fra plastik-død!

"Først lignede det bare en stor klump plastik, men da vi kom tættere på, kunne vi se, at det var en havskildpadde, der var viklet ind i flere hundrede meter langline og plastikdunke," fortæller  skipper på Plastic Change's ekspedition.

Besætningen besluttede straks at forsøge at komme den nødstedte skildpadde til undsætning, selv om de umiddelbart skønnede, at den måtte være død. Skibet blev vendt og efter et par forsøg lykkedes det at komme tæt nok på klumpen af skildpadde og plastik til, at de kunne få trukket den hen til skibet med en stage. Stor var glæden, da skildpadden pludselig løftede hovedet. Nu gjaldt det bare om at få den skåret fri.

Nylonsnor og fiskeline havde viklet sig rundt om både luffer, hals og bagben; men med en kniv og stor forsigtighed lykkedes det at få befriet alle skildpaddens lemmer, og jublen var stor, da den dykkede og forsvandt ud i Stillehavet. En enkelt gang løftede den hovedet og kiggede, og så var den væk.




"Vi er selvfølgelig glade for, at vi fik reddet skildpadden. Men samtidig er vi dybt berørt over et så kontant bevis på den skade, plastik forårsager blandt havets dyr. Det var jo helt tilfældigt, at vi lige kom forbi, ellers ville skildpadden helt sikkert have været død af sult. Den havde ingen mulighed for at befri sig selv" fastslår havbiolog  der er med som forsker på ekspeditionen.

 og hendes assistenter ombord finder hver dag plastik i de prøver, de tager i et område af Stillehavet, der ikke tidligere er blevet undersøgt for plastik. Prøverne vil blive nærmere analyseret og indgå i en global databank over plastikforurening.

Del gerne denne triste nyhed!



Synes godt om Kommenter Del

   653 Populære kommentarer ▼

271 delinger

Appendix 4b



har delt **Danmarks Naturfredningsforenings Studenterafdeling i Aalborgs begivenhed.**

16 timer

Red verden med hjemmestrikkede og -hæklede karklude. Ved tilmelding inden 7/4 er der gratis garn!



12
APR

Strik mikroplastikken ud af verden...
tir 19:00 · KUL Nordkraft · Aalborg, Denmark
78 personer er interesserede · 23 personer ...

✓ Interesseret ▼

Detaljer

DN-SAA sætter fokus på mikroplastik!

Hver eneste dag tilføres der flere hundrede tons plastic til vores verdenshave. En af de typer plastic som er særlig problematisk er det såkaldte mikroplastik. Mikroplastic er bittesmå partikler af plastic der er stort set umulige at oprense og som optages i fødekæden og truer både vores eget og verdens økosystemers helbred – der er allerede fundet mikroplastik i muslinger, honning og vin bare for at nævne nogle få eksempler.

Kom til en hyggelig aften hvor vi informerer og snakker lidt om problemet med mikroplastik og hvad man selv kan gøre – f.eks. opfordrer vi til, at du på netop denne aften medbringer og aflevere dine gamle, grimme og kedelige karklude som er proppet med mikroplastik (ca 20% af sådan en karklud er plastik!), der forsvinder ud i naturen hver gang du vasker dem eller skyller dem under vandhanen. I stedet vil vi hygge os med at strikke vores egne, smukke og miljørigtige karklude af genbrugsbomuldsgarn! Vi har snacks, garn og pinde med, men medbring også gerne dine egne pinde hvis du har – så er vi sikker på der er nok. Alle er velkomne, øvede strikkere samt nybegyndere – vi hjælper hinanden og står gerne til rådighed til at give et crash course i strik . Fik vi nævnt, at arrangementet selvfølgelig er gratis?

Arrangementet foregår på den hyggelige Café KUL på Nordkraft hvor man kan købe drikkevarer til studentervenlige priser.

SU meget gerne senest d. 7. april, da vi skal nå at bestille en passende mængde garn hjem.

Appendix 4c

 **Plastic Change**

Hjemmegjorte karklude uden mikroplastik er et hit, og mens pindene gløder, går snakken om plastikforurening. Det glæder vi os over i Plastic Change, for jo mere vi taler om det, jo større er chancen for, at de ansvarlige hører det og forhåbentligt gør noget, inden det er for sent



Hjemmestrikkede karklude hitter i kampen mod plastik

Flere steder på Facebook kan man købe hjemmestrikkede karklude uden mikroplast og samtidig støtte et godt formål.

DR.DK

 **Synes godt om**

 **Kommenter**

 **Del**

   og 1,1 tusind andre

Populære kommentarer ▾

Appendix 4d



Plastic Change



Nyt fra S/Y Christianshavn: karklud strikket med saltvand og solcreme!
Karkludedillen er nu nået til Stillehavet, hvor skipper [redacted] giver sig tid til en strikkepause i agterstavnen - hvor pindene gløder med plastfrit garn lavet af økobomuld.

Appendix 4e



Verdenshavene bugner af plastik, der ofte ender i maven på fisk, skildpadder og fugle. Og i sidste ende på vores spisebord.



Miljø-NGO efterlyser pant på plastik

Læs mere

91 tusind visninger

👍 Synes godt om

💬 Kommenter

➦ Del

👍👎👤 1,8 tusind

Populære kommentarer ▾

484 delinger



Plastic Change

har svært ved at styre sin vrede, da Ekspedition Plastik besøgte Kamilo Beach: En strand på Hawaii, som hver dag begravnes i plastik, der flyder i land. Det er helt vildt – og stranden blev endda rensat for 10 dage siden! Del og like vores opslag, så er du med til at sætte fokus på de globale plastikproblemer. Du kan også blive medlem af Plastic Change og støtte vores arbejde for et miljø fri for plastikforurening: <http://plasticchange.dk/signup-pages/signup-overview/>. Det koster 200 kr. om året. Hold øje med Facebook, og få flere opdateringer fra Kamilo Beach.



585 tusind visninger

👍 Synes godt om

💬 Kommenter

➦ Del

👍👎👤

og 4,8 tusind andre

Populære kommentarer ▾

8945 delinger

FREDAG 19. FEBRUAR/ MX.DK



Skibet skal undersøge, hvor meget plastik der er i havet mellem Galapagos og Los Angeles. PLASTIC CHANGE

Dansk skib skal finde plastik

SKRALD. En dansk ekspedition er stukket til søs for organisationen Plastic Change for at indsamle data om, hvor stor udbredelsen af plastikforurening er i verdenshavene.

»Ekspeditionen har netop passeret Panamakanalen og er på vej ud i Stillehavet, hvor vi ved, at vi har den største kon-

centration af plastik og mikroplastik,« siger leder af Plastic Change, [REDACTED]

»Vi vil trawle plastik og dokumentere, hvor store mængder der er, hvilken størrelsesfordeling og om plastikken optages i de fisk, vi fanger på ekspeditionen.«

De indsamlede informationer skal indgå i det globale overblik over plastikforureningen i verdenshavene.

En ny rapport fra World Economic Forum forudser, at hvis der ikke bliver gjort noget ved plastikproblemet, vil vægten af plastik i 2050 overstige vægten af fisk i verdenshavene. RITZAU