At low tide: an absence of water, and abundance of plastic

by

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I declare that the above dissertation is my own work and that all sources that I have used or quoted have been indicated and acknowledged by means of complete references.

26 January 2021

SIGNATURE January 2021

DEDICATION

Dedicated to the non-human creatures in my life. To Leia, Ripley, Zorro, Zigzag and Roo, the felines that entertain and amuse me each day. Also to Tiglet, Kitty Knoo, Ching and Jelz, and Phritha, Elsebe, Roxy, Hermione and Rowena, the felines and rodents that I miss dearly.

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ABSTRACT

This project deals with the concepts of care, contentedness and self-reflection in light of the ecological plights that face our planet and the way that my artistic practice reflects this. It achieves this by focusing on marine forms of plastic pollution along Cape Town's coastline as well as on the water resources during Cape Town's water crisis that started in 2017. To unite these areas of interest, the conceptual platform and the visual associations of "a low tide" were used to navigate material and practical considerations of my chosen alternative photographic media and how they can best address such interests.

Key words: marine plastic pollution, water resources, Cape Town's shoreline, alternative photography, low tide.

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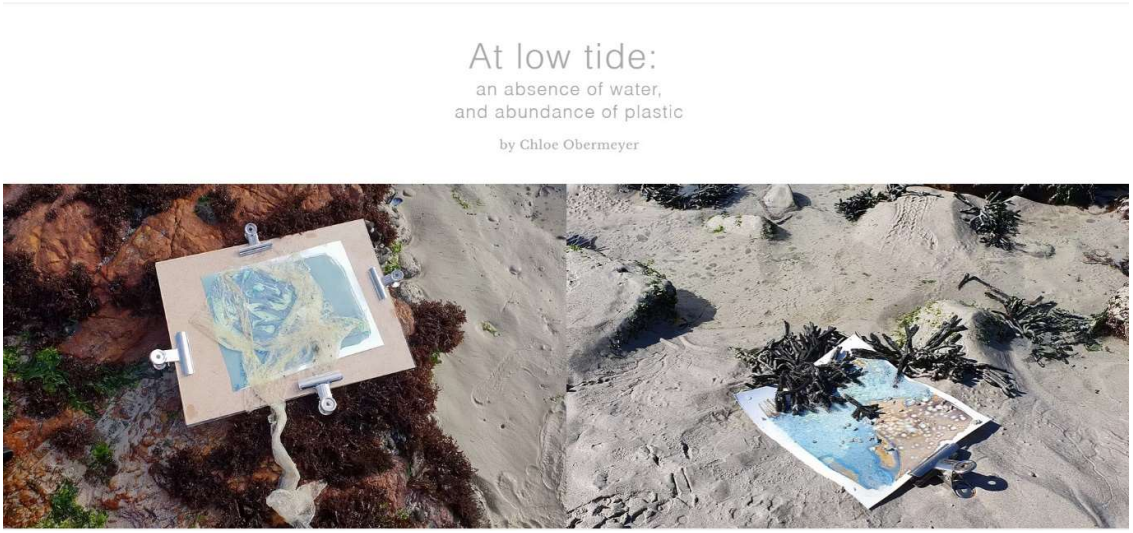

CHAPTER ONE: INTRODUCTION

1.1. Background

This research reflects upon my own artistic practice, which has always focused on the natural world, the ocean and southern Africa's coastlines, in particular, while scientific discoveries and exploration have often aided my conceptual framework. Upon becoming a volunteer at the Two Oceans Aquarium in Cape Town in 2017, I began interacting with creatures such as barnacles, sea urchins, sea stars[1] and sea cucumbers that fascinated me due, not only to their curious appearances, but also their tenacity in withstanding changes to their environments. I learned how these creatures have perfectly adapted to survive in the intertidal zones and to the realities of their immediate environments. During the same year, the Cape Town water crisis was greatly impacting the lives of Capetonians as the threat of "Day Zero" became a reality.

I began to notice a conceptual similarity to my artistic practices at the time – the idea of adaptation due to necessity in response to the needs of my surroundings. My central medium is the alternative photographic process of cyanotype. As discussed in Chapter Four, this process has a poetic lineage linking it to the natural world as it was used by botanist Anna Atkins in the mid-1800s to create a series of books documenting various sea plant specimens.

Cyanotypes – along with other alternative photographic processes – require a fair amount of water in order to be developed. During the beginning of the Cape Town water crisis in 2017, I began using grey water and sea water in order to develop my prints. By using ocean water, I am able to create work about the sea while actually using it. When collecting water for printing, I regularly find myself at the beach during low tide. During this time, there is an absence of water that usually submerges the intertidal zones and, as noted, the fauna and flora of these regions have adapted to withstand changes

[1] During my volunteer training at The Two Oceans Aquarium, I was taught that "sea star" is the term that is most accurate as sea stars are not fish, thus making "starfish" somewhat misleading.

in these environments. What is also revealed is how such life often co-exists amongst humankind's plastic waste. Amidst the beached kelps and plant material is scattered plastic matter, much of which can be easily mistaken for algae due to its colouring and texture. These observations culminated in this research and the accompanying body of artworks, as I considered how my interactions within my natural surroundings influence my art making and vice versa.

1.2. Research Problem

I intended to place myself, as both artist and researcher, in the centre of a project that considered ideas surrounding waste, absence and adaptation. My areas of interest include taxonomy, field studies, narrative and storytelling, and ecological aesthetics. I also aimed to reflect upon how practical elements of my own artistic production have been altered due to an increasing concern for my surrounding environments. This stems from the knowledge that humankind's increasing waste production and demands of the earth's natural resources are negatively impacting our natural environment. I also consider the conceptual and material links that my artistic processes have with the subject matter they depict.

Thus, this investigation utilises the idea of a low tide to conceptually link two areas of focus – the 2017/2018 drought in Cape Town [2] and marine plastic pollution as is evident along the city's coastline. Furthermore, this investigation is interested in both the conceptual and visual intersection of scientific research and artistic endeavour. It considers the enchanting and wondrous qualities of the ocean and natural world while also contemplating the contrasting dismal realities of environmental destruction caused by humankind. This investigation aims to highlight small moments that are easily missed as opposed to more apparent ones that are in plain sight. To accomplish this, frequent literal as well as metaphorical references are made to the tidal zones of Cape Town's beaches by considering the changing environments as well as the animal and plant adaptations that embody these ecosystems.

[2] While the drought has since improved and water restrictions have been eased, Cape Town does still face a "new normal" as a water-scarce city.

This is done by considering the abundant fauna and flora of Cape Town's coastlines and their ability to adapt to and thrive in the ever-changing environments of the tidal zones. I then elaborate on such examples with reference to the 2017/2018 drought in Cape Town and to draw a parallel between marine ecosystems adapting to decreasing water in tidal pools and urban ecosystems adapting to decreasing water in a city. This includes the concept of a low tide and how marine plastic pollution is most evident when the tides have receded.

While this investigation aims to consider humankind's negative impacts on the environment, it does not pass judgement but rather contributes to knowledge that focuses on the welfare of Cape Town's natural surroundings, marine ecosystems and coastline. This research intends to contribute to prominent environmental narratives and conversations that are occurring on a global scale. By intimately focusing on my own immediate natural surroundings, I intended to align myself within these areas of concern while giving an account that is local to a main city in South Africa.

1.3. Project Overview

This project consists of two components that were created in conjunction with one another and work together to create a whole: a theoretical research component, in the form of this document, and a practical component, in the form of a body of artworks and an accompanying catalogue. My artistic, practical works could not exist without the key theories, artistic influences and research data that form this document. Conversely, the creation of my artworks aided the selection process of sources that were relevant to this investigation and could strengthen it as a whole. Working in this way was an organic process and, as the creation of artworks evolved and sometimes shifted, so did the accompanying theoretical component.

In this way, art making in itself becomes a means of research that is influenced and strengthened by pre-existing academic conversations and relevant data.

1.4. Research Questions

The following research questions formed the guideline for this investigation:

- How can the idea of a tide be used as a sustained form of practice to communicate ideas of balance, waste and adaptation? What theory and literature can aid a conceptual framework for this?
- How can the idea of the 2017/2018 Cape Town draught be used as a sustained form of practice to communicate ideas of balance, waste and adaptation?
- How can the alternative photographic methods with which I work be used to grapple with ideas of care, connectedness and self-reflection with regards to the natural surrounding environments?

The methodology and approach are further discussed in the Research Methodology section of Chapter Two.

1.5. Literature Overview

I aimed to investigate relevant areas of environmental concern within Cape Town and on its coastline while also highlighting the splendour of its fauna and flora, with the practical component visually fusing artistic and scientific languages. I intended to achieve this through the lens of ideas surrounding care, connectedness and self-reflection and awareness. Thus, these areas of interest guide the Literature Review. Relevant voices that aid the art making within this project are also noted, as are the theoretical frameworks of the Anthropocene and Ecological Aesthetics.

The Literature Review considers ideas of care, connectedness and personal awareness/reflection as noted in Donna Haraway's book, *Staying with the Trouble: Making of Kin in the Chthulucene* (2016), as well as Karen Barad's paper, "Invertebrate Visions: Diffractions of the Brittlestar" (2014), and Kirksey, Shapiro and Brodine's (2014) paper, "Hope in Blasted Landscapes", both in the book *The Multispecies Salon* (Kirksey, 2014). Timothy Morton's views of "dark ecology" in his book *Dark Ecology: A Logic of Future Co-existence* (2016) are considered, as well as his views of "causality" in

his book, *Realist Magic: Objects, Ontology, Causality* (2013). In addition, I note Serenella Iovino and Serpil Oppermann's views of "storied matter" (2014), ideas of care in Deborah Bird Rose's paper, "Shimmer: When all you Love is being Trashed" (2017) and the paper, "Janet Laurence: Aesthetics of Care" by Prue Gibson and Janet Laurence (2015) as these link to Nathaniel Stern's accounts of "ecological aesthetics" in his book *Ecological Aesthetics: Artful tactics for humans, nature and politics* (2018). The unavoidable realities of marine plastic pollution are considered by noting points in Abigail Susik's paper, "Convergence Zone: The Aesthetics and Politics of the Ocean in Contemporary art and Photography" (2012), as well as the paper, "Marine plastic pollution as a planetary boundary threat – The drifting piece in the sustainability puzzle" by Villarrubia-Gomez, Cornell and Fabres (2018). Stacy Alaimo's paper, "Oceanic Origins, Plastic Activism, and New Materialism at Sea" (2014), as well as her book, *Bodily Natures: Science, Environment, and the Material Self* (2010), are also considered. Johan P. Enqvist and Gina Ziervogel's paper, "Water governance and justice in Cape Town: An overview" (2019),assists in a perspective regarding Cape Town's "new normal" as a water scarce city and the Literature Review ends in a brief critical discussion of the term "Anthropocene" by considering Haraway's suggested alternative of "Chthulucene".

1.6 Artistic Influences

Alongside the abovementioned literature, the artistic practices and selected works/exhibitions of various artists assist both the theoretical and practical component of this investigation. While some artworks and exhibitions influenced my art-making directly, others assisted the theoretical intentions of various sections within Chapters Three and Four.

With the latter in mind, Mark Dion's standpoint regarding being an artist interested in ideas about nature[3], as well as his appropriation of different mind sets as artist, collector, biologist or investigator,

[3]This project uses 'nature' and 'natural world' in an interchangeable way. While I am aware of the lineage that ideas of natural history and 'nature' have with enlightenment, imperialism and colonialism, this project does not focus on such social systems. Thus 'nature' and 'natural world' do not hold such politics within this project.

for example, within his practice, speaks to my interest in visually fusing the languages of art and science. His expansive group exhibition, "Oceanomania: Souvenirs of Mysterious Seas, from the expedition to the Aquarium" (Figure 1), and James Prosek's "Real & Imagined" exhibition (Figures 2, 3 and 4) assists my understanding of the intersections between storytelling and scientific endeavour. Meanwhile, selected works by David Cass in the exhibition, "As Coastline is to Ocean" (Figures 7, 8 and 9), and Olafur Eliasson's "Glacial Currents" (Figure 10) series inform the discussions about the future evolution of shorelines due to the influence of humankind. Alice Fox's mark-making techniques in her "Tide Marks" (Figures 11, 12 and 13) pieces speak to both the visual mark making that I employ within my artistic processes and discussions around the rhythms of tides in tidal zones, while Donald Lawrence's "Underwater Pinhole Photography Project" (Figures 14, 15 and 16) intersects with both my interests in alternative photography and its use to capture creatures of tidal zones.

The visual language of the practical works that accompany this research is greatly influenced by 19th century botanist and artist, Anna Atkins, and her book *Photographs of British Algae*: *Cyanotype Impressions* (1843–1853) (Figures 32, 33 and 34). Atkins' work is of value to this investigation due not only to its importance within the practice of cyanotype making but also its exemplification of how the sciences, such as botanical studies, can and have informed artistic practices. To consider how cyanotypes are utilised within contemporary art-making about the sea, the large cyanotype installation "Sea Cyanotype" by collaborating artists, Melanie King, Antonia Beard, Millie Egan, Brenda Kearney, Katrin Hanusch and Sofia Arredondo (Figure 45), is thus discussed alongside Atkins in Chapter Four.

1.7. Chapter Overview

Following this Introduction Chapter, Chapter Two continues with the Theoretical Framework, Literature Review and Research Methodology. The Literature Review elaborates upon the literature discussed in the Literature Overview section of this introduction chapter. The Theoretical Framework section briefly addresses this project's interest in the frameworks of the Anthropocene and Ecological

Aesthetics. Within this section, Emily Brady's paper, "Environmental Aesthetics" (2008) as well as noteworthy points by Stern and Alaimo, clarify this research's understanding within "Ecological Aesthetics". In the following Research Methodology section, this investigation's practice-based approach is discussed.

This is followed by Chapter Three: Water and Chapter Four: Plastic. The aim of these two chapters is to create an antithesis as Chapter Three focuses on the wondrous, fascinating and integral qualities of water, the ocean and shorelines while Chapter Four elaborates on the contrastingly dismal reality of the overflow of plastic in our marine environments and the depletion of natural resources. Chapter Three discusses various marine geographical, taxonomic and cultural books, such as *Shoreline: Discovering South Africa's coast* (Rojas, Hayward & Loubser, 2010), *Two Oceans: A guide to the marine life of Southern Africa* (Branch, Griffiths, Branch & Beckley, 2008) and South African ichthyologist Mike Bruton's memoir, *When I was a Fish* (2015). Chapter Four focuses on statistical realities regarding marine plastic pollution and the challenges with water supply in cities, later focusing on Cape Town. It touches on these issues on an international scale before drawing the focus locally. This chapter also includes an interview with the Two Oceans Aquarium's environmental campaigner, Hayley McLellan.

Chapter Five: At Low Tide – a title shared with that of this entire investigation – is the chapter in which the practical component of this research is described and analysed. This chapter articulates this project's use of various forms of alternative photography, including cyanotype, lumens and emulsion lifts, while also considering relevant theoretical and visual references that assisted my incorporation of these processes. The lineage and influence of Anna Atkins' *Photographs of British Algae*: *Cyanotype Impressions* (1843–1853) (Figures 32 and 33) is noted, as well as Stern's ideas of tactic, narrative and vulnerability within his views of Ecological Aesthetics. This chapter reflects upon the challenges of creating work using water and my viewpoints regarding the importance of showing care and understanding for our immediate natural surroundings. It also considers the practical component in relation to relevant areas of interest and theories, such as the merging of scientific and artistic practices, and how the materiality of my chosen media can effectively communicate artistic

interests regarding the natural world. This chapter also briefly considers the chemistry and chemical processes that I used within my alternative photographic explorations, before briefly evaluating their ecological impact. This includes a focus on ways of working within media that use comparatively less water as well as a consideration of the value in critically assessing the various means of approaching art making within alternative photography.

This investigation ends with Chapter Six, which will conclude this research in the form of a summary of key points and a reflection upon the project as a whole.

1.8. Ethics

This research received ethical clearance from the University of South Africa's Art and Music Ethics Review Committee on 1 January 2019. "At Low Tide" is concerned with marine plastic pollution along the city of Cape Town's beaches and thus conversations with knowledgeable staff from the Two Oceans Aquarium who have experience with beach clean ups and efforts to eliminate plastic bags in South Africa are presented in Chapter Three. These conversations do not detail anything of a personal nature and are strictly concerned with raising awareness regarding statistics and realities surrounding marine plastic pollution in Cape Town and South Africa.

CHAPTER TWO: FIELD STUDY – MAPPING THE SHORE AND GATHERING SAMPLES

The term "field study" can be defined as the process of carrying out a project or investigation in the natural location and/or context of the subject of study. In this chapter, I gather and connect various theories, ideas and voices within selected fields of literature pertaining to my interest in ideas of care, connectivity and personal reflection. Thus, this chapter proceeds with the Theoretical Framework, in which my meaning with regards to and interest in the Anthropocene and Ecological Aesthetics are mapped out and articulated. Following this, the Literature Review discusses thoughts and voices that influenced this study.

The term "sample" can be understood as a part or section that is intended to show what the whole is (Delahunty, 2002, sv 'sample'), and the Literature Review thus aims to engage in a broader understanding of the ideas that assist this theoretical investigation and the practical component of this project. This chapter ends with the Research Methodology, which explains the practice-led approach that shapes this investigation.

2.1. Theoretical framework

Anthropocene

The term "Anthropocene" refers to the current epoch where the impact of humankind can be physically seen in the environment. The term suggests that humankind can be likened to a geological force that moved the earth out of the geological epoch of the "Holocene" by reshaping and impacting the environment (Steffen, Grinevald, Crutzen & McNeill, 2011). While the scientific validity of this proposed shift is debated in many academic circles, particularly in geological sciences,[4] its relevance

[4] As noted by Monastersky (2015) and Subramanian (2019), there is a desire to define our current epoch as "Anthropocene" due to the accompanied environmental awareness about humankind's impact on the environment. However, such geological classifications depend on definitive geological markers and researchers are thus considering what these markers are and where they might be identified.

within this project lies more in what it represents conceptually than as a geological shift. Discussions around the Anthropocene involve active awareness and consideration regarding the many environmental and ecological plights that affect our planet. The key point is that human beings have negatively impacted climates, ecosystems and environments. This project's focus on marine plastic pollution and water shortages falls directly in line with such discussions. An understanding of the concept of "Anthropocene" can lead to individual reflection regarding our position in an ecologically fragile planet.

Ecological Aesthetics

Academic discussions about ecology in the Anthropocene epoch include Posthumanism, New Materialism and Aesthetics, amongst others. In her paper, "Environmental Aesthetics", Emily Brady (2008:1) describes how environmental movements of the 20th century noticed problems within certain areas of Aesthetic theory, particularly in connection with the aesthetic value of the environment. Brady (2008:4) believes that there is value in conceiving the environment outside of purely human intentions, perspectives or interactions. This project is also interested in aesthetics that place value on the autonomy of our surrounding environments but not through a purely human agenda and perspective. In addition, I am interested in aesthetic considerations surrounding care, connectedness and personal awareness.

In *Ecological Aesthetics: Artful tactics for humans, nature and politics* (2018), Stern presents his views of "Ecological Aesthetics" as a framework in which artistic acts can be contemplated and practiced, describing it as making "*perceptible and sayable some of the intimate interconnections between humans, nature and politics*" (Stern, 2014). Stern (2018:57) regards this framework as a means of understanding the world as a more than human ecology but as an approach that considers how humans are accountable for making and perceiving our world through what we do and how we move within it.

Views regarding interconnections between humans, nature and politics are also apparent in Stacy Alaimo's paper "Wanting All the Species to Be: Extinction, Environmental Visions, and Intimate

Aesthetics" (2019). Alaimo notes that, within considerations of an Anthropocenic future, the desire for biodiversity could be imagined as a multitude of interactions "*between embodied, situated, implicated peoples and other embedded creatures, who live within dynamic, emergent, and relational places*" (Alaimo, 2019:1). Regarding the possibility of a more situated[5] or transcorporeal[6] form of aesthetics that is also more intimate and meditative (Alaimo, 2019:7), Alaimo further states that whether it is literal, speculative, practical or aesthetic, intimate relationality between humans and non-humans could have the ability to ignite enthusiasm for "*the continued existence of multitude of other species and multispecies communities*" (Alaimo, 2019:12).

The views of both Stern and Alaimo are further discussed in the Literature Review.

2.2. Literature Review

The purpose of a literature review is to identify gaps of knowledge within a particular field of study. While this project's practice-based approach is described in the Research Methodology (section 2.3.), Dr Rebecca Lyle Skains observes that such research is often "… *conducted as an attempt to understand the creative artefacts themselves, rather than to respond to a gap in scholarly technique or cultural context*" (Lyle Skains, 2018:86). This project is based on an awareness of the ecological impact that humankind has on our natural environment. It contemplates the way that my own personal art making connects with the natural subjects depicted in my works, from both a practical and conceptual perspective. Thus, this literature review aims to focus on the connections between ideas and voices that can aid this project as opposed to gaps within literature and knowledge. As I am interested in notions of care, connectedness and personal awareness/reflection, I aim to use these notions to navigate the selected voices and areas of thought within this Literature Review.

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[5] Haraway (1988: 585) speaks of a call for a "*practice of objectivity that privileges contestation, deconstruction, passionate construction, webbed connections, and hope for trans-formation …*" or a "situated" knowledge, where personal perspectives are taken into account with regards to objectivity.

[6] Alaimo (2010:2) discusses "transcorporeality" as an understanding of how *"the human is always intermeshed with the more-than-human world*" and how concepts of "human beings" are inseparable from concepts of "the environment".

In Chapter One, I note how this project aims to consider the conceptual and literal characteristics of creatures within tidal zones, contemplating their adaptive qualities as a metaphor for how humans adapt to changes in their immediate surrounding environments. Donna Haraway and Karen Barad utilise similar creatures to demonstrate alternative modes of thought. In her book, *Staying with the Trouble: Making of Kin in the Chthulucene* (2016), Haraway uses non-human animals as visual metaphors for the value of human inter-connected thought processes thus placing human cognition outside of a purely human terrain and positioning it in a space that allows for reflection outside of a purely human perspective. Rather than modes of thought that are merely linear, Haraway promotes ideas and modes of thought that are multi-faceted, that diverge, reach and "crawl out". In a chapter titled "Tenticular Thinking", Haraway reinforces this concept through creatures that consist of many appendages, such as spiders, octopi, squid or cnidarians, thus creating visual analogies to the concept of lateral thinking, ideas and modes of thought. Haraway explains: "… *tentacle comes from the Latin tentaculum, meaning 'feeler' and tentare, meaning 'to fee/' and 'to try'; and I know that my leggy spider has many armed allies*" (Haraway, 2016:31).

Like Haraway, Barad also utilises the visual and anatomical characteristics of a multi-appendaged creature in her poetic analogies of the brittle sea star. In her essay "Invertebrate Visions: Diffractions of the Brittlestar" (2014), Barad explains how the brittle sea star astounded scientific research due to the light sensitive mechanics that its skeletal structure and skin cells possess, including a complex neurotransmitter system that allows a large portion of its physical being to interpret light and react accordingly. This is despite the absence of a brain and means that these creatures possess the ability of a type of sight without having eyes. Thus, Barad proposes that they provide an opportunity for humans to re-evaluate how we understand relationships and interactions (Barad, 2014:230). She explains how the brittle sea star's type of vision is not solely based on optical reflection but on a type of optical diffraction with an emphasis on patterns of difference and is thus "*attentive to different*

optical effects at once" (Barad, 2014:230). She states that this suggests the importance of intra-action[7] as opposed to simple interaction, and how this "*marks the relational nature of the world and its intra-active becoming*" (Barad, 2014:231). As can also be concluded from Haraway's descriptions, Barad suggests that knowledge and "knowing" are not purely human characteristics, and that the brittle sea star's "vision" adaptations demonstrate how knowing, being and doing are connected and can be inseparable (Barad, 2014:233). In this way, both Haraway and Barad utilise non-human animals to not only inform suggested alternative ways of thinking, but also to promote human self-awareness through the realisation that there are modes of interaction and existence that operate outside of a human perspective.

Timothy Morton also suggests the importance of self-awareness and the crucial role it plays in achieving a higher level of ecological awareness. In his book, *Dark Ecology: A Logic of Future Co-existence* (2016), he describes "Dark Ecology" as ecological awareness that is dark and depressing (Morton, 2016:5), especially when we, as individuals and as a species, are confronted by our place within the Anthropocene. As Haraway describes her metaphorical "*leggy spider*" or modes of thinking as having many allies, Morton accounts for the importance of human beings co-habiting with each other and with non-human species. Morton speaks about "*ecognios*", which he defines as an attunement to ecological realities, and how co-existence with non-humans is ecological thought when addressed through art, ethics and politics (Morton, 2016:159). He suggests that "*ecognios involves realising that non-humans are installed at a profound level of the human – not just biologically and societally but in the very structure of logic*" (Morton, 2016:159). The latter relates to Barad's observations that the logic within the existence of creatures, such as the brittle sea star, may offer alternative understandings of logic and reason. Additionally, in his book "*Ecological Intelligence; Rediscovering Ourselves in Nature* (2005), Dr Ian McCallum provides a perspective that heightens Morton's views regarding the level to which non-humans are installed within the human. McCallum

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[7] In her essay "Karen Barad's Intra-active Agential Realism: Towards a Performative Multispecies Aesthetics", Boyd (2015:9) gives a useful definition of Barad's "intra-action" describing it as "*mutual emergence and transformation and the shifting of boundaries.*"

notes: "*We have to wake up to the privilege of what it means to be human: that we are part of the web of life in which everything is genetically and molecularly linked and that human psychology has deep evolutionary roots."*(McCallum, 2005:18)

With all of this in mind, it is worthwhile to consider how humans can perceive our non-human cohabiters. In Eben Kirksey *et al*'s essay "Hope in Blasted Landscapes" (2014) which demonstrates the pitfalls of an absence of ecological awareness and how this can impact on humans' co-habitation with non-human creatures. Kirksey, writing in *The Multispecies Salon* (2014), describes how artist Jaqueline Bishop photographically documented the abundance of oil drenched hermit crabs she encountered during clean-ups in Grand Isle State Parks following the aftermath of the 2010 oil spill in the Gulf Of New Mexico. Apart from birds, British Petroleum Company (BP) and Fish and Wildlife efforts were prioritising saving animals with "*economic benefit or a cuteness factor*" (Kirksey, Shapiro & Brodine, 2014:38). Hermit crabs were not included in these efforts, resulting in the Hermit Crab Survival Project, in which Bishop participated, that cleaned and rehabilitated thousands of affected hermit crabs. Her account explains how humans value non-human life, and what species count as worth saving, i.e., species with human benefit or aesthetic appeal, and what species simply become collateral damage within such circumstances. While Haraway, Barad and Morton have demonstrated what human beings can learn from non-human creatures, Bishop's account exemplifies the value – or lack thereof – that humans can chose to bestow upon non-human creatures.

Bishop's experience provides an account of how human perspective is placed at the centre of events and is thus the most valued perspective. It is this mode of thought that is contested by Haraway within her observations regarding narratives and storytelling. Haraway challenges conventional plotline strategies where the main emphasis is on the hero or lead character as she highlights the self-centredness that accompanies such a placement of importance. Instead, she argues for a re-think of the placement of value within a narrative by sharing it with objects, things and species that the protagonist encounters. She believes that a narrative does not begin and end purely with the story of the lead character as "*no adventurer should leave home without a sack. How did a sling, a pot, a bottle suddenly get in the story? How do such lowly things keep the story going? … the slight curve of a*

shell that holds just a little water ... suggests stories of becoming-with …" (Haraway, 2016:40). This means that we need to re-consider how we place value upon subject versus object within storytelling and narrative, on where the focus should lie and how we perceive the beginning and ending as "*[m]y multispecies storytelling is about recuperation in complex histories that are as full of dying as living, as full of endings … as beginnings*" (Haraway, 2016:10).

In their introduction to the book, *Material Ecocriticism* (2014), Serenella Iovino and Serpil Oppermann provide further perspectives regarding the interconnectivity between human and non-human "*players*" within a narrative or story, as well as the intermingled nature of all matter. They note that

> "the stories of matter are everywhere: in the air we breathe, the food we eat, in the things and beings of this world, within and beyond the human realm. All matter, in other words, is a 'storied matter'. It is a material 'mesh' of, properties, and processes, in which human and nonhuman players are interlocked in networks that produce undeniable signifying forces" (Iovino & Oppermann, 2014:1–2).

Haraway's perspectives regarding the call for a re-shuffling of conventional modes of value within a narrative as well as Iovino and Oppermann's views regarding "storied matter" assist this project's aim to highlight the small moments that I came across during my investigations, as opposed to placing emphasis on moments that are more obvious and in plain sight. Such viewpoints reinforced how a small, discarded plastic wrapper or a single shrivelled anemone can become powerful "players" and hold great value within narratives and placements of value as did Bishop's hermit crabs that became the object to the leading human subject of the narrative.

All of these aforementioned concepts of personal reflection, ecological awareness through an understanding of the world as being "more than human", and interconnectivity – or intra-connectivity, as per Barad – between humans and non-humans, are characteristic of a "multispecies" mode of thought. They encompass the aim for considerate co-existence amongst all species, and an understanding of the intertwined nature that accompanies this. In her essay "Shimmer: When all you Love is being Trashed", Deborah Bird Rose (2017) speaks of multispecies entanglement and the

strange way that this is highlighted through fluxes in Anthropocenic storytelling that alternate between narratives of violence and destruction, and moments of genuine compassion and care. While noting humankind's undeniable tendency for cruelty, Bird Rose also emphasises humankind's capacity to embody qualities and perform acts that allow for camaraderie amongst species (Bird Rose, 2017:56). She defines "care" as an ethical response that facilitates generosity, compassion and an enduring sense of responsibility amidst the knowledge of our own destructive tendencies (Bird Rose, 2017:58).

Kirksey *et al*'s (2014) account of Bishop's experience with the Hermit Crab Project shows the extraordinary acts of care and responsibility that accompany such rehabilitation efforts. Bishop's experience exemplifies *The Multispecies Salon*'s (Kirksey, 2014) interests in conversations about the survival and endurance of beings amidst the collision of "*natural and cultural worlds*" and the possibilities of bio-cultural hope in the aftermath of disaster and catastrophe (Kirksey *et al*, 2014:1). The concept of care can also be beneficial within artistic practices that grapple with environmental and ecological concerns. In the paper, "Janet Laurence: Aesthetics of Care", Prue Gibson and Janet Laurence question where ecologically driven art might fit within a framework where human authority is replaced by "*ontological equality*" and multispecies perspectives. They suggest that the answer may lie "*under the umbrella of an aesthetics of care, which might help to slow down the disappearing act of non-human and human species*" (Gibson & Laurence, 2015:39). They propose that new found ideas surrounding the aesthetics of care align with the desire to move beyond a human-centric perspective and that the aesthetics of care can be found in the meeting points and intersections of species, allowing for agency to become "*an expanded enactment*" (Gibson & Laurence, 2015:39).

In the practical section of this project, I found myself in constant points of interaction and connection with different species on Cape Town's beaches and tidal zones, carefully contemplating my actions and decisions within these environments. This aligns with Stern's views within his "Ecological Aesthetics" framework, as he encourages the invitation and practice of different and novel forms of encounters while also being mindful of the varying degrees of sympathy, concern and care that accompany such interactions (Stern, 2018:5). He proposes that understandings of the term

"ecological" encompass "*thought-felt encounters with relations between all of matter and its ideas*" (Stern, 2018:6). Stern also calls for individuals to consider ways of thinking outside of a purely human perspective. He discusses concepts of narrative, tactic and vulnerability, as will be further elaborated in Chapter Five, by demonstrating how considered and reflective interactions with nature can impact upon our perceptions of our surrounding environments. Describing his series of *Compressionism* (Stern, 2018) works, which were created by using an adapted scanner that was submerged in ponds and the ocean, Stern explains how his observations within and exchanges with his natural surroundings were captured in each image: "*Colours and ... sunlight, electricity and sometimes the lack thereof, movement and change, water and bubbles leaking together… mechanics and nature …*" (Stern, 2018:57). For Stern, such artworks demonstrate a level of "*implicit politics*" of how humans can relate to and perceive the world around us as encompassing not only human perspectives (Stern, 2018:57).

Stern's interactions with and observations of the elements, matter and natural occurrences surrounding him align with Iovino and Oppermann's concepts of "storied matter", with Stern's experience during the creation of his *Compressionism* works relating to their description of how "*the world's material phenomena are knots in a vast network of agencies, which can be 'read' and interpreted as forming narratives, stories*" (Iovino & Oppermann, 2014:1–2). This also suggests that ecologically driven art might be understood not only as art that demonstrates care through compassion, generosity and responsibility, as suggested by Bird Rose (2017), but also as art that stems from thoughtful interactions between artists and their surrounding environments as well as observations of the expansive array of interactions within such environments. This also relates to the processes that I encountered during the practical component of this investigation that involve chemical reactions between light and water as well as found objects or matter while welcoming any unexpected results that may accompany such reactions (see Chapter Five).

With regards to aesthetics within ecologically driven artistic practices and alignments with multispecies interconnectedness, Spirken (1983) defines causality as "*a genetic connection of phenomena through which one thing (the cause) under certain conditions gives rise to, causes*

something else (the effect)". Morton asserts that causality is an aesthetic phenomenon that is not simply limited to connections between humans with other humans or artworks but instead encompasses a multitude of connections outside of the human realm (Morton, 2013). Morton states that aesthetic events "*... happen when a saw bites into a fresh piece of plywood. They happen when a worm oozes out of some wet soil ...*" (Morton, 2013:19). He further suggests that the study or making of art is in alignment with the study and making of causality. From this, it can be concluded that ecologically driven artistic practices can also be understood as practices that appreciate concepts of interconnectivity through cause and effect, and contemplate the impacts of occurrences and/or reactions within our surrounding natural environments.

Morton's views of causality also include contemplating humankind's impacts on its surrounding environments and how even seemingly insignificant actions can have negative effects, for example, one person turning the keys in their car ignition. This seemingly simple act contributes to global warming when amplified by an entire species. Thus, Morton further demonstrates how physiological darkness can accompany ecological awareness. Additionally, Morton notes the consequences of the disconnected view of "nature" as something separate from modern humanity; as something "*over there ... around the corner ... out back*" (Morton, 2016:56). The dangers of such perceptions of nature are also noted by Stacy Alaimo in her book, *Bodily Natures: Science, Environment, and the Material Self* (2010), in which she suggests that humankind no longer has the "*luxury*" of perceiving any environment as beyond the reach of our destruction. She notes: "*Matters of environmental concern and wonder are always 'here,' as well as 'there,' simultaneously local and global, personal and political*" (Alaimo, 2010:15). Additionally, Morton highlights humanity's problematic concepts of "space" versus "place", noting how ideas of "space" suggest blankness that can be conquered, moulded and governed, stating how Earth is not a "*blank sheet for projection of human desires*" (Morton, 2016:63).

Humankind's perceptions of "blank spaces" within environments that then become occupied by human projection are also noted by Abigail Susik (2012) in her paper "Convergence Zone: The Aesthetics and Politics of the Ocean in Contemporary Art and Photography". Speaking of an ocean

polluted by "*non-biodegradable flotsam*", Susik (2012) notes how the ocean was once the recipient of human projections of ideas regarding "otherness" but is now a place where our own "*grotesque experience of unavoidable self-reflection*" is apparent (Susik, 2012). Like Morton, Susik demonstrates the dark and uncomfortable realities that can accompany ecological awareness and suggests that this is blatantly reflected in our oceans. She notes: "*The formerly awe-inspiring sublimity of the ocean as a cultural symbol has now given way to a new kind of disturbing awareness: humanity can no longer escape itself through exploration of alien reaches*" (Susik, 2012). This idea of the far reaches of the ocean being viewed by terrestrial humans as foreign, out of reach or "alien", is also noted by Alaimo. In her paper "Oceanic Origins, Plastic Activism, and New Materialism at Sea", Alaimo notes how many marine habitats are relatively unknown to scientists and this results in them being depicted as "alien" (Alaimo, 2014:188). This presents potential pitfalls concerning human reflection and awareness with regards to our roles in polluting such habitats as the associations that accommodate an "alien" environment suggest something that is far beyond our realm of existence, something "over there", as noted by Morton (2016). This is further complicated by perceptions, as noted by Alaimo (2014), of the ocean as being so "*vast and powerful that anything dumped into it will be dispersed into oblivion*" (Alaimo, 2014:186), thus making the publicising, mapping and tracing of pollutants across terrestrial, oceanic and human environments even more challenging (Alaimo, 2014:188).

Human perception of the ocean as so vast, powerful and otherworldly that anything entering it will become obsolete by comparison is particularly relevant with regards to plastics and marine plastic pollution as the conglomeration of plastic items that a single human discards may seem comparably insignificant when compared to the expanse of the seas. However, much like Morton's analogy of turning a key in a car ignition, when this is amplified across humankind, the effects on our surrounding environments can become catastrophic. In their paper, "Marine plastic pollution as a planetary boundary threat – The drifting piece in the sustainability puzzle", Patricia Villarrubia-Gomez *et al* (2018:217) note that the ultimate fate of the majority of mismanaged plastics is that they eventually land in the ocean, where it is estimated that between 86 and 150 million tons of plastic debris currently resides. They further suggest that "*... there is still deep ignorance and high*

uncertainty about the pathways that plastic actually takes to the marine environment" (Villarrubia-Gómez *et al*, 2018:215), explaining how the production, use and disposal of plastic is currently one of the most conspicuous "*anthropogenic activities*" (Villarrubia-Gómez *et al*, 2018:213). As this project is concerned with both marine plastic pollution and water supply and consumption within Cape Town, it must be noted that mismanagement is not only a problem within plastic production and disposal as the management of the natural resource of water is also largely lacking. In their paper, "Water governance and justice in Cape Town: An overview" (2019), Johan P. Enqvist and Gina Ziervogel discuss the 2017/2018 Cape Town water crisis, and how the threat of "Day Zero" – a day when all taps would have to be switched off – followed a three year drought and threatened to leave four million residents queuing at public tabs for water (Enqvist & Ziervogel, 2019:1). They note how safe drinking water and water security, yet another Anthropocenic topic, are critical challenges for cities, especially due to urbanisation and climate change (Enqvist & Ziervogel, 2019:2).

The idea of "Day Zero" – a frantic, disastrous day when the water supply becomes limited to only a few commercial tap points – seems almost apocalyptic, and is perhaps reminiscent of *The Multispecies Salon*'s (Kirksey, 2014) interest in the aftermath of disaster and catastrophe. Additionally, the eventual resting place of mismanaged plastics within our oceans brings to mind Iovino and Oppermann's (2014) views regarding how humans and non-human players are interlocked in networks, with the network of human-made plastics landing in the ocean being an unfortunate reality. These also link to ideas of causality and the eventual negative effects of human consumption and pollution. Such ideas and images are typical of the Anthropocene. As a term, I would argue that "Anthropocene" does offer an opportunity for humankind to acknowledge its role within ecological destruction and places the responsibility for this on us as "*[y]ou, the human, made the plutonium, or you the human can understand what it is – therefore you are responsible"* (Morton, 2016:161).

"Anthropocene" places human beings in the centre of the narrative about who impacted the earth and how. We become the lead characters but this goes against Haraway's views regarding placing more emphasis on less obvious subjects and objects within a narrative. Additionally, Haraway notes: "*Species man does not make history … man plus tools does not make history. That is the story of*

history human exceptionalists tell" (Haraway, 2016:49). Within thoughts of multispecies entanglements, queries regarding the term "Anthropocene" and its centring of the human also align with questions that have been posed by Iovino and Oppermann (2014:3):

> "… how does such mentality deal with the complex phenomena in which human agency is only a part of the picture? How does it conciliate with the entanglements of more-than-human forces and substances, which, visibly or imperceptibly, merge with the life of our bodies and places?"

Morton does acknowledge such critiques, also noting how alternative terms, such as "Capitalocene", also pose queries. He suggests that capitalism is a symptom and not the direct problem, noting: "*Anthropocene is about humans – a mess of lungs and bacterial micro-organisms and non-human ancestors and so on – along with their agents such as cows and factories and thoughts, agents that can't be reduced to their merely human use or exchange values*" (Morton, 2016:21) .

This view is understandable, however, "Anthropocene" does not suggest that non-humans share the same broken earth and are thus also experiencing the consequences. Additionally, it does not inspire any hope for a future. As noted by Haraway, the term is arguably overtly cynical and defeatist, suggesting that it is too late to change the predicaments we created (Haraway, 2016:56). Alaimo also appears to promote more optimistic approaches within ecological awareness, noting how

> "… reckoning with mass extinction, pollution, climate change, and the 'slow violence' … of local and global environmental injustices is painful and depressing, environmental movements would do well to promote alternative pleasures, sensualities, aesthetics, humour, and sustaining multispecies communities" (Alaimo, 2019:9–10).

Briefly, other proposed alternatives include "Technosphere" and "Eurocene", with an emphasis on technological advances and orientation within the European Industrial Revolution, as well as "Plantationocene", which acknowledges colonial powers at play within Anthropogenic thought (Davis & Turpin, 2015:8).

With all of this in mind, I find Haraway's (2016:101) proposed term "Chthulucene" to be most interesting. "Chthulucene" suggests the unified inclusion of many species whose "*ongoingness is at stake*". As described by Haraway, Chthulucene, meaning "*past, present, and to come*", is named

"*after the diverse earth-wide tentacular powers and forces and collected things with names like Naga, Gaia, Tangaroa (burst from water-full Papa), Terra, Haniyasu-hime, Spider Woman, Pachamama, Oya, Gorgo, Raven, A'akuluujjusi, and many many more*" (Haraway, 2016:101). The term is arguably less linear, and suggests the connectedness of all living and non-living things towards and within many narratives. Haraway proposes that "*[t]he Chthulucene does not close in on itself, it does not round off, its contact zones are ubiquitous and continuously spin out in loopy tendrils*" (Haraway, 2016:33). Furthermore, images associated with those situated within Haraway's "Chthulucene" are reminiscent of Barad's observations regarding the brittle sea star, while the open and inclusive nature of its possible narratives lead towards ideas of multispecies entanglement, "storied matter" and relating to and perceiving our surrounding environments beyond a purely human perspective. While "Anthropocene" is most definitely a crucial term for this project, I tend to align with Tsing, Gan, Swanson and Bubandt (2017a) in their introduction to the book *Arts of Living on a Damaged Planet: Ghosts of the Anthropocene* who say that "*[o]ur use of the term 'Anthropocene' does not imagine a homogeneous human race. We write in dialogue with those who remind readers of unequal relations among humans, industrial ecologies, and human insignificance in the web of life ...*" (Tsing *et al*, 2017a:3).

This project is situated in storytelling and connectedness. It is interested in care and personal reflection, and how an appreciation of our surrounding environments and the ecological challenges that accompany them might heighten these. Situated within the theoretical framework of the Anthropocene, this project also embraces the intentions behind ideas such as Haraway's Chthulucene. This project aims to navigate all of this through art making that promotes ideas regarding Ecological Aesthetics, carefully and imaginatively considering myself and my art in relation to the environments I engaged with. Through careful interactions with intertidal environments and considerate use of mediums within my art making, I aimed to align myself with the ideas discussed within this literature review. This was achieved by navigating through a lens outside of a purely human perspective, and inviting unexpected connections and evolutions of thought within my practice that allowed my art making to reflect upon the interconnectedness of all the species I encountered.

2.3. Research Methodology

This project consists of both a practical and theoretical component that work in conjunction with one another. The ideas and voices within the Literature Review aid this investigation by providing a larger scope within academic thought in which the interests of this project could operate. They link back to the research questions by understanding how ideas of waste, absence and adaptation can be conceptually and visually investigated with reference to Cape Town's intertidal zones as well as the 2017/2018 drought and the city's "new normal" as a water scarce city. This is accomplished through lenses of care, connectedness and personal reflection while noting concepts of the Anthropocene and Ecological Aesthetics.

All of this feeds both the art-making of this investigation as well as the processes behind such art making. Thus, this project adopts a practice-based approach to research, which can be understood as "*… an original investigation undertaken in order to gain new knowledge partly by means of practice and the outcomes of that practice*" (Candy, L. 2006:3). In her paper, "Creative Practice as Research: Discourse on Methodology", Dr Rebecca Lyle Skains (2018) speaks about the "*exegesis*" that accompanies creative work when working within practice-based research methodologies, explaining how knowledge that remains implicit within an artist becomes explicit and situated within the relevant fields of academia (Lyle Skains, 2018:86). Lyle Skains explains the inseparable nature between critical theory and creative work within such a methodology, and how these inform each other (Lyle Skains, 2018:96).

With all of this in mind, this project aims to reflect upon the alternative photographic processes that I have adopted within my art-making and the end products of these processes by intersecting them with other voices and ideas. As the creation of artworks shifted and evolved, so did the accompanying research, and vice versa. The creation of artworks culminated from a review of personal photographic references and documentation, collected objects, collected organic debris/matter and documented on-site findings. This was further guided by my own personal responses to, observations and interactions within Cape Town's shores, as well as my experiences living in a water sparse city.

The latter would suggest that, at times, I operated within "Auto-Ethnomethodology", in which reflective analysis is used as the approach that "*seeks to describe and analyse personal experience in order to extrapolate understandings about wider cultural experience*" (Lyle Skains, 2018:88). To compensate for the potential pitfalls of reflective analysis and self-observation within such an approach, Lyle Skains suggests the use of a precise research plan and the post-examination of all creative end-products as well as in-situ notes or drafts (Lyle Skains, 2018:96). As I was assisted and guided by the Research Questions and Research Problem in Chapter One, as well as the voices and frameworks discussed in this chapter, my personal reflections and experiences were firmly placed within the realm of scholarly contribution. Furthermore, the nature of the artworks I created and their accompanying notes – as can be seen in the catalogue for this project – embody the role of "in situ notes or drafts". Thus, a combination of personal experience and reflection, and academic thought guided the practice-based approach of this project.

CHAPTER THREE: WATER

Water is the most valuable substance on planet earth. It sustains all of life and is what allows our planet to be affectionately called the "blue planet". An estimated 75 percent of our planet's surface is covered in water (Graham, Parkinson & Chahine, 2010) with the ocean's salty seas accounting for about 97 percent of this (National Oceanic and Atmospheric Administration [NOAA], 2020c). Furthermore, water constitutes 99 percent of the habitable volume of our planet (science.nasa.gov, 2021). Water is believed to have existed on our planet since around 4.5 billion years ago, although the reason for its abundance remains somewhat of a mystery (Hird, 2017:1). Its appearance on our planet is what instigated the processes that allowed our surrounding environments to evolve into what they are today. As noted by marine biologist Tom Hird: "*Water allows chemicals to travel, offers electrons for reactions, dissolves salts and gases, stabilises temperatures and provides buoyancy, giving relief from the harsh effects of gravity*" (Hird, 2017:1). While all of terrestrial animal life is believed to have originated in the sea, humankind knows very little about the environments of our once watery origins. Furthermore, many of us human land dwellers have become greatly disconnected from the sea.

In this part of Chapter Three, I consider the wondrous and vital qualities of water and the ocean. To assist in this, selected exhibitions and artworks that exemplify this intention are discussed in accordance with the focus of each section. It begins by addressing ideas of the ocean more broadly before focusing on the shorelines and coasts of southern Africa. This chapter starts with "Narratives and Storytelling", which considers stories, legends and myths about the ocean with a focus on the intersection between scientific and artistic thought. This extends into "Shorelines: Ecologies of Curiosity and Concern", which navigates the geographical and ecological qualities of shorelines and their evolution, both due to nature and to humankind. This chapter ends with "Intricacies of Rocky Shores" which relays information about the curious and dynamic nature of marine tidal zones and their inhabitants, noting the perplexing nature and "shimmer" within these environments.

3.1. Narratives and Storytelling

This project is concerned with narratives and storytelling as well as how scientific discoveries and exploration have motivated my artistic practice. Here, I aim to consider moments where science or scientific endeavours intersect with storytelling and narratives about the ocean. This speaks to my interest in the fusing of scientific and artistic thought, as narratives, stories, fables, myths and legends occupy an artistic and creative sphere. My intention is to relay some of the imaginative storytelling that sparked my childhood fascination with the seas. Narratives, legends and myths have a profound impact upon humanity and Dr McCallum notes how myths and legends "…*are carriers of meaning and the quest for meaning is one of the most defining characteristics of the human animal* " (McCallum, 2005:27). I also consider how storytelling and narratives can ignite intrigue about the natural world while communicating valuable insights regarding caring for it.

The fusing of artistic and scientific languages or the use of narratives and storytelling within the sciences has not always been positively viewed. In his paper, "Using narratives and storytelling to communicate with non-expert audiences", Michael Dahlstrom notes how storytelling has often had a bad reputation within the sciences and has even been viewed as manipulative (Dahlstrom, 2014:13614). He acknowledges that storytelling follows inductive reasoning while scientific methods of information utilise deductive reasoning. However, he also notes that, when communication is shifted from the likes of data collection to communication with non-expert audiences, the use of narratives and storytelling may be more appropriate as research suggests that narratives and storytelling are both more engaging to many audiences and easier to comprehend (Dahlstrom, 2014). Dahlstrom notes: "*Narratives are often associated with increased recall, ease of comprehension, and shorter reading times. In a direct comparison with expository text, narrative text was read twice as fast and recalled twice as well, regardless of topic familiarity or interest in the content itself*" (Dahlstrom, 2014:13614). While the use of imaginative storytelling should not contaminate the waters of scientific facts and discovery, storytelling about the natural world can ignite a fascination with scientific endeavours and thus heighten an interest in nature.

In his memoir, *When I was a fish* (2015), South African Ichthyologist Mike Bruton shares how he came to realise that there is great merit in scientists communicating in more informal ways that are also more entertaining. He looks back to Zulu, Xhosa and Khoi-San societies, and how they use dance, song, poetry and storytelling to relay information to younger individuals and maintains that "*[t]his is a wonderful way to celebrate science, not only among young children but also adults, as the reiteration of childlike curiosity is vital for the incubation of new ideas*" (Bruton, 2015:271). This sentiment speaks, not only of the fusing of artistic and scientific languages, but also highlights the key role that narratives and storytelling can have in invoking interest and curiosity about our surrounding natural environments. The value of "curiosity" within this regard is also noted by Anna Tsing *et al* in their paper "Haunted Landscapes of the Anthropocene", in which they suggest that "*to survive, we need to relearn multiple forms of curiosity. Curiosity is an attunement to multispecies entanglement, complexity, and the shimmer all around us*" (Tsing *et al*, 2017a:G11). Thus, narratives and storytelling are potentially powerful tools to spark such curiosity which, as noted by Bruton (2015), could aid the communication of scientific thought.

Throughout the centuries, scientific endeavour of the natural world and storytelling have greatly informed one another, with the ocean and its coastlines being no exception. More than 80 percent of the ocean remains unmapped and unexplored (NOAA, 2018) and it is thus understandable why the ocean has, for so long, intrigued scientific discovery and been synonymous with ideas of mystery and the unknown. The same is true of the vast numbers of species that inhabit the ocean, many of which have yet to be discovered or are rarely observable (NOAA, 2020b). Sightings of and encounters with once undiscovered ocean creatures have elicited many tales, fables and narratives about the sea. What humankind has now come to classify as fiction was historically not always as easily discernible as fictitious. The storytelling that accompanied what are now understood as mythical creatures would, at times, intersect with science. This allowed for many accounts and incarnations of "monsters" or monstrous creatures.

In their paper, "Bodies tumbled into Bodies", Tsing *et al* (2017b) note how the concept of "monsters" is useful within Anthropocenic thought, as monsters encapsulate multispecies transformations, and are both wonders of symbiosis and threats of ecological disruption (Tsing *et al*, 2017b:M2).

For example, as a more literal addition to Haraway's "tenticular thinking", the now taxonomically classified *Architeuthis dux* (colloquially known as the "giant squid") was once known by many names with its most famous arguably being "The Kraken". In their paper "The Kraken: When myth encounters science", Rodrigo B. Salvador and Barbara M. Tomatani note how, according to an ancient manuscript written by King Sverre of Norway that dates to around the year 1180, the Kraken was one of many monsters that were sighted and believed to inhabit the seas around Norway, Iceland and Greenland (Salvador & Tomatani, 2014:972–973). Initially, its size was described as kilometres in length but as narratives evolved and sightings increased descriptions of the creature's size began to resemble proportions that are more aligned with contemporary scientific measurements of the now commonly known "giant squid".

In 1752, Bishop Erik Pontoppidan described "The Kraken" in his book *The Natural history of Norway*, giving what many naturalists believed as exaggerated accounts of the creature, such as descriptions of its menace toward sailors and its gargantuan size. Despite this, Dr Robert Hamilton did not dismiss Pontoppidans' accounts and, in his 1839 work, *The Natural History of the Amphibious Carnivora*, described him as "*learned*" (Hamilton, 1839:315) while, at the same time, suggesting that the Kraken was likely a cephalopod of sorts: "… *yet probably without much difficulty this extraordinary Kraken may be identified with certain species of Sepia, or Cuttlefish*" (Hamilton, 1839:330). Hamilton continued, however, by quoting various accounts that described the creature as "monstrous" and "gigantic", thus shifting between scientifically oriented facts and mythological modes of thought. This intermingling of scientific intention and mythical narrative can be further noted by how Carl Linnaeus included the Kraken as "*Microcosmus Marinus*" in the first edition of his

work "*Systema naturae*", in which he classified all known living species[10] (Salvador & Tomatani, 2014:976).

The tales of the monstrous Kraken were not the only contemporary understood stories of fiction to once intersect with scientific classification. In the early 19th century, natural scientists began to contemplate whether creatures of fable and mythology, such as "mermaids", were, in fact, simply extinct species (Laurent, 2017). As explained by Béatrice Laurent in her paper "Monster or Missing Link? The Mermaid and Victorian Imagination" (2017), the question surrounding the existence of mermaids was replaced by defining what they actually were – a separate species or a hybrid creature. There were even considerations that the creatures behind what had become known as mermaids were possibly an intermediate species between humans and other animal species or even an ancestor of both aquatic and terrestrial forms of life. This was further ignited by the growing evidence suggesting that all living species came from the sea, causing speculation that perhaps the creatures known as mermaids were the link that could explain the evolution from fish to humans (Laurent, 2017). In the early 1820s, the fake specimen "FeeJee mermaid", which was later revealed as a monkey head and torso combined with a fabricated fish tail, caused much excitement when exhibited to the general public while scientists debated its authenticity.

Curiously, the biologically factual and authentic platypus, which was observed in the late 1790s, also sparked great zoological scepticism regarding its authenticity (MacDonald, 2018). With time, the understanding of mermaids shifted as speculation arose that sightings of pre-existing animals were the cause for mermaid myths. In his 1883 book, *Sea Monsters Unmasked*, naturalist Henry Lee considers the possibility of marine mammals, such as seals or manatees, being the creatures responsible. He notes: "*The seals and their movements account for so many mermaid stories, that all accounts of sea-women with prominent bosoms were ridiculed and discredited until competent observation of certain aquatic animals* …" (Lee, 1883:40).

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[10] Linnaeus later regretted including an "imaginary" creature in his factual and scientific works, thus removing The Kraken from future editions of *Systema naturae* (Salvador & Tomatani, 2014:977).

This fusing of fables with science and the intermingling of natural history with imaginative thought has often influenced contemporary artistic endeavour. This can be clearly noted in Mark Dion's expansive project and exhibition, "Oceanomania: Souvenirs of Mysterious Seas, from the expedition to the Aquarium" (2011). The exhibition was held at the Nouveau Musée National de Monaco and its Villa Polama venue. It included works from various contemporaries of Dion and culminated in a celebration of not only the Museum's artefacts but also the wonder and complexity of the ocean. Within the exhibition, a conglomeration of historical natural illustrations, artefacts, specimens, cultural curiosities and contemporary artistic visions in response to these could be noted. Of particular interest for Dion was the Museum's earlier concerns for "*aesthetics and scientific missions oriented towards the undiscovered*" (Basta & McAllisater, 2011:156). The concept for the exhibition reflected upon the "*ocean craze*" that reached its peak during the late 1800s, when "*navigations, lively narratives and scientific interest in the ocean flooded popular imagination*" (Basta & McAllisater, 2011:147). Examples of this could be linked back to the excitement around the "Feejee mermaid" specimen as well as scientific endeavours to uncover and define creatures of storytelling. In his massive artwork, *Oceanomania Cabinet de Curiosites le Musee Oceanograpghique* (Figure 1), Dion curated a collection of artefacts and specimens that were displayed in a large cabinet within the museum. Dion aimed to unsettle conventional classification methods and demonstrate how perceptions of value for different artefacts differ between the scholars of the museum and outside eyes (Basta & McAllisater, 2011:158).

This idea of disrupting traditional classification can also be viewed in the works of one of Oceanomania's contributing artists, James Prosek. In his "Real & Imagined" exhibition (Figures 2, 3 and 4), Prosek fused the visual language of naturalist illustration with the language of imaginative renderings. Prosek is known for his illustrated books documenting trout, eels and other forms of wildlife and the works within "Real & Imagined" intersect his interests "… *in the tradition of rendering from nature with a turn toward the inner world of fantasy*" (Ravenal, 2009:1) .

Figure 1. Mark Dion, Detail of curiosity cabinet at the Oceanographic Museum of Monaco (2011).

Many of the works depict hybrid creatures that merge separately classified species. The result is the visual creation of species that are both fantastical yet somehow arguably familiar, as though they are plausible in a curious way. The works also reflect upon a time when the vastness and diversity of the natural world slowly infiltrated scientific knowledge and public awareness through observations and artefacts from adventures and voyagers (Ravenal, 2009:1). During these times, travellers' accounts and descriptions of newly seen creatures were greatly depended upon and it took skilled imagination to render these creatures on paper (Ravenal, 2009:1). Sea Pegasus (nocturne) (Figure 2) and Twilight Sailfish (Figure 3) show intersections between marine and terrestrial creatures, as the bodies of a seahorse and a sailfish are given feathery wings. Prosek also plays with language cues regarding the naming of animals, as seen in Parrotfish (Figure 4) in which Prosek creates a creature that is half fish and half terrestrial parrot. The resultant creature is arguably reminiscent of the juxtaposition and logic behind the constructed "FeeJee mermaid" specimen.

As noted in the exhibition catalogue: “James Prosek skilfully navigates the line between fact and fiction, real and imagined as he continues to probe our perceptions of nature and the inherent subjectivity of the constructs we devise in our attempt to comprehend it” (Langdale, 2009:7).

Figure 2. James Prosek, *Sea Pegasus* (nocturne) (2009).

Figure 3. James Prosek, *Twilight Sailfishe* (2009).

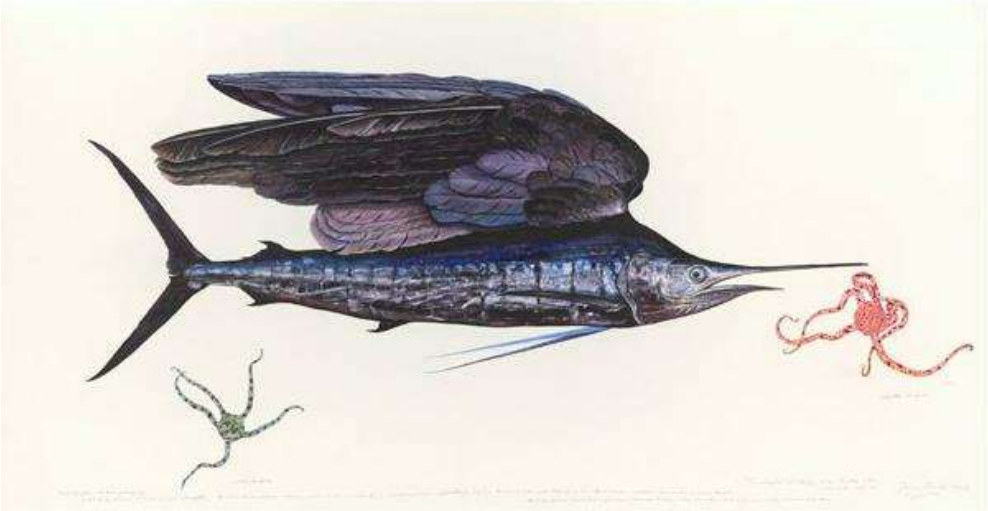

Figure 4. James Prosek, *Parrotfish* (2009).

Tales of mythical creatures, scientific endeavours and narratives where fact intersects with fiction are potentially useful tools to ignite curiosity in our surrounding natural environments. However, narratives and storytelling can also be an effective means of communicating ecological awareness. Fables, legends and tales often have a message or meaning that either runs throughout the story or perhaps becomes apparent by their endings. Oliver Jeffers' illustrated fable, "The Fate of Fausto" (2019), tells the tale of a man who felt an overwhelming sense of entitlement towards the natural world. Proudly walking about and exploring what he could declare as his own, he defiantly proclaimed "You are mine!" to a flower, sheep, tree, lake, field and mountain. Fausto's anger and arrogance eventually swayed all of these into accepting his ownership of them. Consumed by greed, he boarded a boat and headed to sea with the aim of claiming the ocean as his own. "Sea, you are mine!" he proudly exclaimed in the vast expanse of mid ocean. However, the sea calmly rejected this, explaining that Fausto could not own it if he did not love it, and could not love it if he did not understand it. Angered by this, Fausto threatened to exert his power by stomping his foot, eventually leading him to fall overboard and drown in the sea. Jeffers writes: "*The sea was sad for him but carried on being the sea. The mountain too went back to its business. And the lake and the forest, the field and the tree, the sheep and the flower carried on as before. For the fate of Fausto did not matter to them*" (Jeffers, 2019).

The underlying message of Jeffers' (2019) fable raises awareness of the importance of respect for and understanding of our surrounding natural environments. It speaks to thoughts noted in the Literature Review regarding how human life and perspective is not central to our world and the danger that accompanies arrogance and a lack of genuine care. In a way, Jeffers' fable (2019) aligns with an observation made by Haraway regarding Nazi war criminal, Adolf Eichmann, who, like Fausto, was unable to comprehend "*... what the world in its sheer not-one-selfless is ...*" (Haraway, 2016:36). Through an illustrated story that might be viewed as aimed at children, Jeffers' (2019) tale demonstrates how narratives and storytelling can communicate nuanced concepts of ecological care and awareness.

Figure 5.Oliver Jeffers, Details from the illustrated novel “The Fate of Fausto” (2019).

Figure 6.Oliver Jeffers, Details from the illustrated novel “The Fate of Fausto” (2019)

Dahlstrom's (2014) notes regarding scientific data communication versus communication through storytelling show how reading statistics and documented accounts of the negative by-products that human greed has on our natural surroundings could indeed provide valuable information and possibly elicit ethical awareness. Storytelling and narratives, however, can also elicit critical thought and ethical awareness, as noted in the tale of how Fausto's arrogance and greed led to his demise within the environment he attempted to own and his subsequent insignificance within the greater scheme of nature. This occurs on an engaging and even emotive level and demonstrates the value that narratives and storytelling can have in communicating the value of caring for our natural world.

3.2. Shorelines: Zones of Curiosity and Concern

As I intend to draw visual and conceptual parallels with the tidal zones of Cape Town's beaches, this section considers noteworthy geographical and ecological factors concerning the shoreline that surrounds these zones, as well as humankind's impacts on and interactions with them. I outline geographical characteristics of southern Africa and Cape Town's coasts and shorelines, noting how they have shifted and evolved through time and at the hands of humankind. As this part of the chapter is titled "Water", I also consider how rising sea levels may impact shorelines and coastlines of the future.

A Xhosa tale tells the story of Qamata and his battle with the Sea Dragon, Nkanyamba. According to the legend, while Quamata was creating dry land, the Sea Dragon attempted to stop him as a fierce battle ensued that left Qamata crippled. Quamatas's mother, the Earth Goddess, then created four warriors to protect the land, each of them ultimately being killed by the Sea Dragon. In their final moments, these warriors pleaded to be turned into mountains, so that they could continue to protect the earth even after death. One of these giant warriors was named *Umlindi Wemingizimu* or "Watcher of the South", and he became Table Mountain[11] (Micheni, 2018). This tale of the Sea Dragon battling

[11] Geographical co-ordinates for Table Mountain are 33.9668° S, 18.4256° E

the creator of the earth gives a dramatic visual of the meeting between land and sea, what is otherwise known as a shoreline.

A shoreline can be defined as the line or section where a large mass of water, such as an ocean or lake, meets the land (Delahunty, 2002, sv 'shoreline'). Shorelines and areas where terrestrial surfaces meet the sea are where humans mostly have physical interactions with the ocean. This includes promenades, beaches, piers or cliffs. Shorelines are intersections between ideas of the known and the unknown, the familiar terrestrial environment and the unfamiliar marine environment. Speaking of his fascination with the ocean's mysterious nature and the conflicting emotive response it triggers, Bruton notes how "*People fear the sea yet flock to see it in droves. We feel nurtured by its caress yet we have a mortal fear of drowning*" (Bruton, 2015:8). Not only do shorelines and coastlines act as most humans' main point of encounter with the sea, but also as the optimum point of comfort between the safety of land and the potential dangers of the sea. Bruton continues, "*One of the attractions of the coast is that it is an interface between an environment that we know (the land, safe refuge) and one that is relatively unknown (sea, full of danger and mystery)*" (Bruton, 2015:9).

In his paper "Future Megafaunas: A historical Perspective on the Potential for a Wilder Anthropocene", Jens-Christian Svenning (2018) notes how it can be difficult for humankind to imagine ecosystems of the past. He speaks of what scientists call "the shifting baseline syndrome", and how humankind tends to imagine that landscapes and ecosystems that we remember are representative of past environments. Thus, Svenning suggest that it is critical to consider environments of the past as "*attention to longer histories allows us to appreciate the rich, diverse landscapes that have existed in pasts beyond human memory*" (Svenning, 2018:68). In keeping with Svenning's suggestion, a brief overview of the history of the formation of Southern Africa's coast is given before considering its current form.

The sea along the coast of Southern Africa consists of two oceans – the Indian on the East and the Atlantic on the West. One hundred and eighty million years ago, the supercontinent of Gondwana started to separate and the rift between the East and the West of the supercontinent allowed the sea in

that led to the formation of the ocean floor and the birth of the Indian Ocean. Further rifts between the African continent and what would become South America resulted in the formation of the Atlantic Ocean and, by about 90 million years ago, southern Africa was completely surrounded by sea (Rojas *et al*, 2010:12). Since then, the boundary between land and sea has been changing as sea levels rose and dropped through the millennia. At its maximum sea level rise, approximately 20 000 years ago, the shoreline in certain areas of Southern Africa reached between 50 and 150 kilometres further inland than it is now (Rojas *et al*, 2010:12).

Today, South Africa's coast spans over almost 2 800 kilometres with the warm Agalhus current to the East and the cold Benguella current to the West. The intersection of these two currents and oceans allows for vast biodiversity. The meeting of these two currents does not have a distinctive boundary, but is dynamic and responsible for southern Africa's coasts and shorelines having some of the richest and most diverse ecosystems on our planet. This is due to the differing conditions within each current and the resultant conditions of their intersection (Rojas *et al*, 2010:18). This also impacts climate, rainfall, temperature and vegetation along southern Africa's shores (Rojas *et al*, 2010:19). The shoreline of Cape Town expands over 307 kilometres, running along the West Coast and around the Cape Peninsula towards False Bay and the Kogelberg Coast (City of Cape Town, 2018:37). This vast stretch of shore consists of sandy beaches, rocky shores, tidal pools, estuaries, coastal dunes and cliffs resulting in an overlap of organisms from both the Atlantic and the Indian Oceans. This variety of environments means that a richly diverse array of marine and coastal ecosystems can be found along Cape Town's shoreline (City of Cape Town, 2018:38). This coast is home to more than 80 rare and endangered species within the False Bay area alone. Sixty-one percent of the 2 000 marine species found here are endemic to South Africa and 14 percent of these are endemic to the Cape Town area (City of Cape Town, 2018:38).

While shorelines have been evolving and changing naturally throughout history, they have also been moulded by human intervention. As noted by Tsing *et al* (2017b:G6): "*As humans reshape the landscape, we forget what was there before*". The shoreline of Cape Town prior to the 1930s looked considerably different to what it does today. Some areas of the city that are now occupied by busy

roads, highways, businesses and residential buildings were once sandy beaches or even below the ocean level and two old shorelines currently lie buried beneath the city's infrastructure (Halket, 2012:5). A public pier once stood at the now completely urbanised end of Adderley Street and extended about 300 metres into the bay (Halket, 2012:12–13). While Woodstock is now known as an ever gentrifying business and residential area, it was once home to the popular Woodstock Beach. Today, street names, such as Beach or Tide Roads, "haunt"[12] the Woodstock area and hint about its old shoreline (Pace, 2019). The reason for this sharp change of shoreline was due to land reclamation efforts that occurred towards the late 1930s in response to a need to accommodate city expansion and harbour facility needs (Halket, 2012:2), resulting in about two million metres^2 of land being reclaimed. Thus, with dredged up sand, rock and mud, sections of Cape Town's shoreline were dramatically altered by the need for human urbanisation (Halket, 2012:18).

Urbanisation and humankind do not only alter coastlines intentionally, however, and the effects of urbanisation and modern life have had an ever increasingly negative impact on our surrounding natural environments. Increasing carbon emissions and their effects on global warming are melting vast amounts of glaciers and ice sheets that increase the amount of water in the ocean. One major result of this is that sea levels are rising; the global mean sea level having risen around 21 to 24 centimetres since 1880. The past two and a half decades have seen a third of this increase, meaning that the rate at which the sea level is rising is accelerating (Lindsey, 2019). While climate and sea levels have indeed been changing naturally for hundreds of millions of years, the most recent changes are not due to natural phenomena (Rojas *et al*, 2010:13). Most scientists today agree that anthropogenic impacts and climate change are currently the greatest threats to our natural ecosystems and biodiversity. The impacts of rising sea levels will be extensive and will impact coastal environments as the ocean engulfs and erodes these regions. As the sea level rises, shorelines and how or where the land meets the sea will change. Should all the ice in the Antarctic ice sheet melt, the sea

[12] I use the word "haunt" in reference to Tsing *et al* (2018: G2) who note how "*[e]very landscape is haunted by past ways of life.*"

level could rise by 65 metres and the shorelines that we know today would shift considerably (Rojas *et al*, 2010:13).

In his book, *The Water Will Come: Rising Seas, Sinking Cities and the Remaking of the Civilized World* (2017), Jeff Goodell addresses the causes and impacts of rising sea levels. He notes how the Arctic has warmed about twice as quickly as the global average in the past 20 years (Goodell, 2017:54). The aforementioned impacts of melting glaciers and ice sheets on rising sea levels is indeed an alarming reality and, while the value of contemplating the world outside of a purely human perspective has been emphasised, another alarming reality is the impact that such rising sea levels could have on coastal urban life. Goodell notes that, in certain low lying cities and residential areas, "*the difference between three feet of sea level rise by 2100 and six feet is the difference between a wet but liveable city and a submerged city…*" (Goodell, 2017:65). As most of southern Africa is surrounded by ocean and thus consists of an array of beaches, coastal suburbs, coastal towns, coastal residential areas and harbours, a rise of the sea level is of great concern. As noted by Goodell, "*Water will continue to creep in … seawalls will crumble …. In a few decades, low lying neighbourhoods will be knee deep ... Modern office buildings and condo towers will lean as salt water erodes the concrete foundations…*" (Goodell, 2017:257). This will also extend to the fauna and flora of shorelines and coastal environments as the increase in ocean water will be invasive and the species of these areas will have to re-adapt in order to thrive. Depending on the extent of sea level rise in such areas, shorelines could change dramatically as an unintended result of humankind's industrial processes.

In their 2019 exhibition, "As Coastline is to Ocean", in An Talla Solais Gallery in the Scottish coastal village of Ullapool, Joseph Calleja and David Cass presented two perspectives on the selected topic of coasts and coastlines. Explaining how they are both drawn to water, Calleja and Cass selected the topic as both a nod to Ullapool's coastal setting and to the 2020 Scottish Year of Coasts and Water. The personal artistic practices of each artist informed their departure from the topic of the exhibition, with Ullapool's physical coastline acting as their starting point .While Calleja used an anthropological approach with an emphasis on site specificity and an interest in the essence of an object, Cass employed an approach that emphasised environmental concern (Calleja & Cass, 2019), thus making

his work of particular interest for this section. Cass (2019) notes how his work focused on the topic of sea level rise, and how the works within the exhibition dealt with the impacts of melting ice.

Allowing for playful experimentation, Cass included a selection of found and collected items in the creation of his works, including bundles of antique paper, cine film, lantern slides, a projector, etching equipment and a cyanotype starter kit. He notes: "*The frayed border of a Super-8 projector became the coastline of a long ago family film … crumpled turquoise carbon-paper photographed in thick morning light became dappled sea surface …*" (Cass, 2019). Cass's studio shots for "As Coastline is to Ocean" (2019) (Figures 7, 8 and 9) and the incorporation of old-school photographic slides and projections are relevant to this project's interest in alternative modes of photography, but also bring a nostalgic vision of shores and the coast. In Figure 7, the idea of memory or "what once was" is invoked, bringing to mind ideas of "Shifting Baseline Syndrome" and humankind's tendency to depend on visions of environments and landscapes "*… at the edge of our own memories*" (Svenning, 2018:68). Meanwhile, Cass's works capture the realities that rising sea levels have for coasts and shorelines as can be seen in *114mm Ago* (2019) (Figure 9). In this work, Cass cast salt upon a found metallic photographer's plate, allowing for the resultantly textured and ice-like salt cast to form a coastline across the metal. This piece aligns with Cass's reference to "*… the increased levels of salt that warmed water contains*" (Cass, 2019).

The subject of the effects of melting ice can also be noted in Olafur Eliasson's "Glacial Currents" ([Sa]) series. In it, portions of ancient glacial ice were placed and allowed to gradually melt atop of thin washes of watercolour. The ice used within the works was fished from the sea off the coast of Greenland, and the effects of it melting among the layers of watercolour resulted in newly formed water displacing the watercolour pigments, allowing for the creation of swells and movements between water and colour stains, which became imprinted in a very organic manner upon the surface of the works (Eliasson, [Sa]). This means of mark-making and movement between matter upon a surface relates to the processes that I employ within my art making, while the name and incorporation of melting ice refers directly to aforementioned realities regarding melting ice sheets and the rise of the sea level.

Figure 7. David Cass*, Details from the catalogue accompanying "As Coastline is to Ocean"* (2019).

Figure 8. David Cass, *Details from the catalogue accompanying "As Coastline is to Ocean"* (2019).

Figure 9. David Cass, *144mm Ago* (2019).

Figure 10. Olafur Eliasson, *Glacial Currents (yellow, sienna)* (2018).

Shores and coastlines are dynamic environments that are accompanied by both a diverse array of ecosystems and the intersection of human perspectives of the familiar and less familiar. As noted in the catalogue for "As Coastline is to Ocean", "*[i]t is a place for looking out from, it is an edge, it is a dividing line between different elements, or a meeting place for those elements*" (Wright, 2019). As this project is interested in connections rather than divisions, I prefer to think of shorelines as places of meetings between the aforementioned elements, aquatic and terrestrial life, knowledge of current coastlines and knowledge or memories of past coastlines, or the meeting point where the edge of humankind's impacts on the environment is creeping ever more closely towards us.

3.3. The Intricacies of Rocky Shores

The Literature Review (section 2.2.) noted Barad's accounts of the adaptations of the brittle sea star and the alternative perspectives it can offer humankind regarding connections, seeing and being. This section considers the curious nature of various creatures and species in tidal zones and on rocky shores. I aim to relay information of adapting to the needs of our surrounding environments and note the splendid intricacy of these ecosystems. The vital dynamics of changing tides and the "shimmer" inherent within these wondrous coastal zones are briefly addressed. Instead of including all species within these zones, this section focuses only on those species that were incorporated within this project's art making.[13] Much of the information relayed within this section was acquired during my training and volunteering at the Two Oceans Aquarium.

Bruton (2015:1) recalls his thoughts of an experience he had at aged ten:

> "How do sea urchins decorate themselves with broken shells? Why do starfishes have tubed feet? I lay on the rough rock and gazed wide-eyed through my goggles into the intertidal pool … plant like anemones waved their tentacles at me, hermit crabs hitched a ride in someone else's shell … It was a fantasy world beyond my wildest dreams".

[13] This selection was guided by what species I most regularly came into contact with and could observe.

This account perfectly describes this project's fascination with the oddities and the dynamic nature of marine tidal zones and rocky shores where life is dictated by the tides that bring the diverse opportunities that species can take advantage of (Hird, 2018:40). Two high and two low tides per day are a result of the gravitational pull of the sun and the moon. When the earth, moon and sun are in alignment during the new moon, this results in extremely high and low "spring tides". On the contrary, in "neap tides", the high tide is comparatively lower and the low tide is higher than usual. This ebb and flow of water results in sections of the intertidal zones alternating between being submerged in water and exposed to air and sun depending on the tides and the geographical location of the tidal area. The fauna and flora of these zones have adapted to survive these changes of environment. These include latching onto or moulding around rocks to brace for incoming tides, mechanisms for preserving moisture and water during low tide, and adjusting physical form depending on the amount of water that is available. These are some of the tactics that assist entities to thrive in these competitive zones.

Within tidal zones and rocky shores, the shortcomings of the human perspective are often made apparent, as many of the creatures within these areas are perplexing to human logic. For example, creatures, such as sea anemones, challenge conventional distinctions between "animal" and "plant" with Bruton's description of "plant like anemones" accurately portraying their confusing characteristics. While they may visually be reminiscent of flowers, sea anemones belong to the phylum "Cnidaria" and are indeed animals.[14] Not only this, but their flowery tentacles contain nematocysts or stinging cells that are around the central mouth of these creatures. Anemones use these stinging cells to feed on small prey, such as shrimp or fish, but, to the human eye, the visual of a plant-like anemone devouring an animal, such as a fish, may be baffling. Additionally, anemones may appear sessile when they are, in fact, capable of movement, albeit slowly from a human perspective. Other examples of seemingly sessile creatures that are mobile are sea urchins and sea stars, both

[14] A species that I spent a particular amount of time interacting with is *Bunodactis reynaudi,* colloquially known as "sandy anemones".

belonging to the phylum "Echinodermata". Again, both are animals and use small tube feet to move about. Notably, sea urchins ability to move is integral for its surrounding ecosystems, as they are valuable grazers that keep surrounding rocks free from algae and other matter (Hird, 2017:43). Urchins also use these tubes to hoist small bits of kelp or shells above themselves as a means of camouflage or protection from the sun. A peculiar adaptive feature of sea stars is their ability to extend their stomach outside of their mouths – located centrally beneath them – and over digestible parts of their prey, such as into the shell of a sessile mussel. Additionally, sea stars contain light sensitive structures at the end of each arm that can comprehend varying degrees of light and thus aid a sea star's movements.

The animals within these zones are not the only perplexing species. The "ocean's vegetation" (Hird, 2017:24), what most humans refer to as "seaweed", is extremely diverse and curious. Hird (2017:24) notes that they are "*a real pain for taxonomists*". Seaweeds are actually large algae,[15] and do not possess a root system, instead having "holdfasts" that allow them to attach to surfaces and are thus abundant in the rocky shores (Anderson, Stegenga & Bolton, 2016). These species also perplex human classifications as they do not fit neatly into the understandings of "plant". Botanist Michael. D. Guiry (2020) notes:

> "Algae are very simple chlorophyll-containing organisms: some say they are plants; others say that they are not … According to most recent polygenetic studies, both are not quite right. Some algae (most greens and reds) are indeed related to the land plants, and some flagellated algae are related to protists, but there is no justification for the including of algae in any generic term other than 'algae'".

Marine plant biologist, Professor John. J Bolton, notes that algae or seaweeds are plants in a broad sense, as they are "*... organisms that fix carbon from dissolved forms in the water into carbohydrates, via the process of photosynthesis*" (Anderson *et al*, 2016). This blurry classification extends further to the colour of algae, as they are classified into red, green and brown algae, with the majority of South

[15] Large algae refers to algae that are "macroscopic" and can be seen with the naked eye (Anderson *et al*, 2016).

African algae being red. However, this distinction becomes confusing as some red algae may appear more brown or green when viewed in shallower waters (Anderson *et al*, 2016). The algae noted in tidal zones and coastal areas are growing and living in those environments, or ones that washed ashore from deeper waters, often forming the majority of beach wracks found in higher sandy areas. The decomposition of such organic matter contributes vital nutrients to coastal and marine food webs. Beach wracks also often consist of other marine organisms, both dead and alive, such as crustaceans and sponges (Coast Protection Board of South Australia, 2017).

Andreas Hejnol, in "Ladders, Trees, Complexity, and other Metaphors in Evolutionary Thinking" (2017), calls for a renewed understanding of how we relate to and perceive our non-human earth co-habitors, noting that certain perceptions and metaphors regarding the evolution of species need to be reconsidered. Hejnol explains how pre-evolutionary systematisations, including the aforementioned Carl Linnaeus's "Systema naturae" (Salvador & Tomatani, 2014), used linear modes of classification that once placed humankind and God at the top of evolutionary classification, listing other species beneath in accordance to their perceived levels of complexity. Following evolutionary theory, such linear hierarchical systems morphed into the metaphor of a tree, branching species classifications in accordance with genealogy. But this, however, still maintained a linear approach, positioning species within perceptions of simple to complex. However, Hejnol (2017) notes that this does not always capture realities within nature accurately and that evolutionary understandings of simple to complex must, at times, be challenged. With the development of polymerase chain reaction (PCR) and related technologies in the late 20th century, scientists are now able to observe not only organism morphologies but also their genes, allowing for new understandings of the relationships between organisms (Hejnol, 2017:90–91). Hejnol notes how recent studies have shown that human beings are more closely related to sessile sponges-creatures, which have no musculature or nerve cells, than to comb jellyfish, which contain elaborate sensory organs, nerve cells and individual muscle cells (Hejnol, 2017:94).

Sea sponges regularly wash ashore and form part of beach wracks. Like anemones, urchins and sea stars, sponges are creatures whose classifications as animals might be puzzling for many humans. Sponges are classified in the phylum *Porifera* and are aquatic invertebrates with dense, porous skeletons and no tissues (NOAA, 2019). Furthermore, although sessile, sponges also align with anemones, sea stars, and urchins regarding movements that are not discernible to human eyes. As noted by Hird (2017:86), time lapse technologies show that, "*despite appearances, a sponge is always moving, its cells constantly shifting … [and that] some amazing time-lapse footage has revealed how sponges shift and twist….*" Ada Smailbegović, speaking of the seemingly motionless nature of sea stars within a tidal pool in her paper, "Cloud Writing: Describing Soft Architectures of Change in the Anthropocene", notes how the use of camera technologies can bring "*… the rhythms of starfish time into contact with the temporal pace of the human perceptual world*" (Smailbegović, 2015:97). When filmed using technology that can capture images at a pace that human perception cannot comprehend, the extensively mobile life of a seemingly stagnant creature is revealed. Furthermore, Smailbegović links this to biologist Jakob von Uexküll's ideas of "Umwelt", which can be defined as an animal's "*perceptual life-world*" (Sagan, 2010:2). "Umwelt" is how creatures' lives, such as those discussed in relation to tidal zones, differ vastly from humans. Speaking of the terrestrial snail, Von Uexküll (2010:72) notes: "*Even the snail's own movements do not seem slower to it than ours do to us*". Thus, one might argue that the inhabitants of the intertidal zones are perplexing to the human umwelt and its impulse for classification.

The curious oddities of creatures within the intertidal zones and the dynamic flow of ecosystems within the rhythm of the tide are a wondrous spectacle to behold. Looking back at Bruton's memory of his intrigue while looking into intertidal pools, it can be proposed that it was the "shimmer" inherent within these environments that so sparked his fascination. "Shimmer" is described by Deborah Bird Rose (2017:G51), who speaks of her accounts with the Aboriginal people in the Victoria River region of Australia's Northern Territory. Bird Rose (2017) explains how the Yolngu word "*bir'yun*" that can be translated as "brilliant" or "shimmer" encompasses ancestral powers that appear in moments of relations and encounters (Bird Rose, 2017:G52–53). She notes that such

brilliance and "shimmer" can be seen in many places, such as "*... water capturing and reflecting the sun, the sun glinting on water, the eyes of beholders captured and entrapped, the ephemeral dance of it all"* (Bird Rose, 2017:G53*).* A sea urchin hoisting bits of kelp or shell above its head, a sea star reacting to varying degrees of light, an anemone's stinging cells numbing its prey, the abundance of glistening sunlight in the ocean water, the encounters and relations inherent within ideas of shimmer can be seen all over the rocky shores and tidal zones. Bird Rose also explains her experiences regarding understandings of shimmer within music and dance, and how shimmer can be experienced through temporal patterns (Bird Rose, 2017:54).

Thus, it can be argued that the pattern or rhythm of the tide's perfectly timed ebb and flow can also encapsulate such ideas of shimmer. Furthermore, Bird Rose (2017) also describes how an absence of shimmer can allow for the "potential" for shimmer in the future. She describes this in relation to the changing from dry to wet seasons, with dry environments making way and allowing potential for the later shimmer and brilliance of wet seasons. This relates to the pulse of spring tides. An absence of water during extreme low tides exposes species within rocky shores to sun, air and an absence of moisture. Anemones shrink and curl their tentacles inwards, various algae and kelps dry up. Yet, with the coming of vast amounts of water during high tides, the tentacles of the anemones bloom again and dried up algae rejuvenate.

The manoeuvres of the tides and inhabitants of rocky shores provide interesting opportunities for artistic practice. In her "Tide Marks" series (Figures 11, 12 and 13), Alice Fox criss-crosses mark making, textile and printmaking techniques to create a series of works that draw reference from the movements and patterns inherent during the meetings between tides and shores. While her work does not deal with rocky shores and tidal zones as such, it does iterate the rhythm and movement inherent in the ebb and flow of tides. Utilising ocean water and tea, Fox notes how items she collected on the beach were able to "make their mark" within the works, while additional hand stitching captures the manner in which material is collected and moved by the tidal waves. She notes: "*An object comes my way, with the tide, with the mystery of the movement of wind, sea and sand, or simply the consequence of human negligence*" (Fox, [Sa]). Figure 11 shows how the elements, such as the rust from the

metallic items to which Fox's knit works are attached, assisted in mark-making as they seep into and stain the wool. The interactions between matter and the resultant visual creations upon a surface align with processes that I employ within the art making for this project. Additionally, I also incorporate the use of ocean water and collected beached matter, allowing for the interactions between these and photographic chemistry to create their own forms of mark-making.

Figure 11. Alice Fox, *Detail of "Tide Line"* (2013).

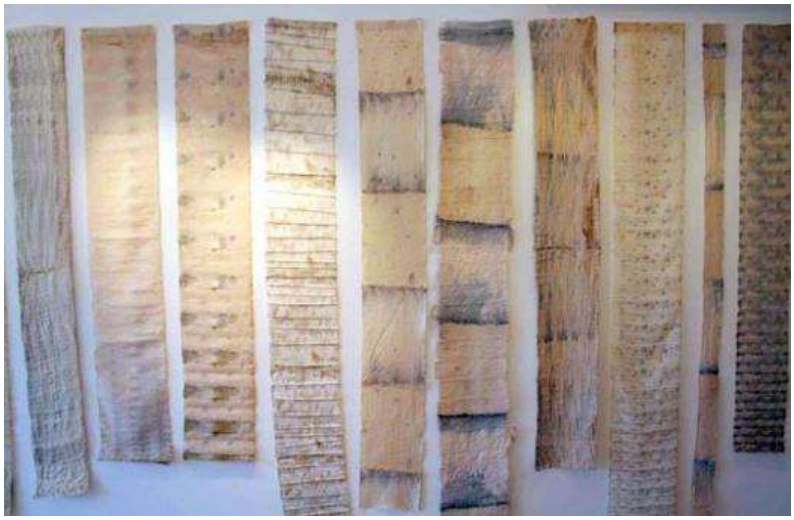

Figure 12. Alice Fox, *Exhibition views of "Tide Marks"* (2013).

Figure 13. Alice Fox, *Exhibition views of "Tide Marks"* (2013).

The tidal zones and rocky shores, conversely, are specifically noted and captured in the photographic works and accompanying notes of Donald Lawrence (2000). In his "Underwater Pinhole Photography Project" (2000), Lawrence unites his interest in historical optical and photographic formats with his interest in inter-tidal and sub-tidal coastal zones. This is achieved through the creation of specially designed pinhole cameras that are lowered beneath the ocean waterline, capturing images of the creatures within intertidal pools (Lawrence, 2000). The inherent visual quality of pinhole photography and thus of these particular works is reminiscent of the aesthetics associated with historical photographs, vastly contrasting with the intense crispness and high resolution of contemporary digital images. This lends a tone of mystery to Lawrence's works, giving the anemones and sea stars in his photographs an almost mystical presence. The accompanying journals and field notes also provide valuable hints regarding the process behind Lawrence's photographs. As the process of artwork creation is as valuable as the end products within this project, it relates to the planning and in-situ nature of Lawrence's works. In Figure 14, a pinhole camera can be seen resting upon an intertidal rock, with photographs scattered around it. Thus, not only does the alternative photographic nature of Lawrence's project correlate with mine, but also the field research narrative that is reflected in his journals.

Figure 14. Donald Lawrence, *Locations Journal* (1998).

Figure 15. Donald Lawrence, *Seppings Island* (2006).

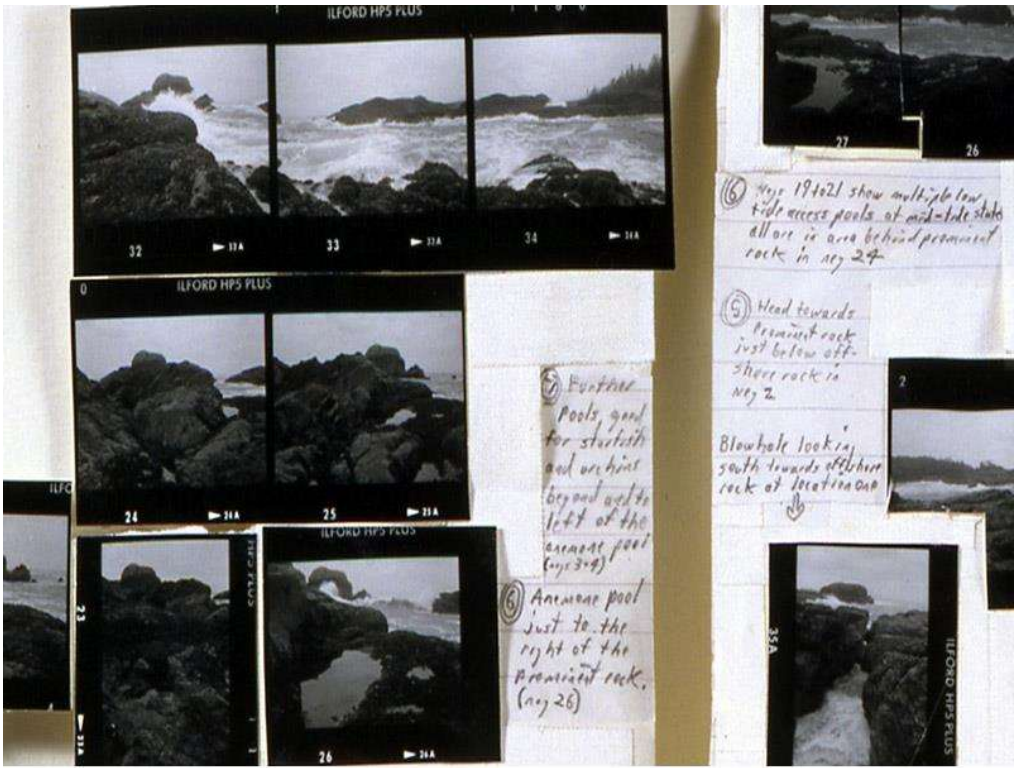

Figure 16. Donald Lawrence, *Detail of Locations Journal* (1998).

My interactions with the creatures and the "ocean's vegetation" within the tidal zones and the "shimmer" that I found in these environments led to the ideas that formulated this project. I align with a sentiment shared by Bruton: , "*[t]he longer I watched, the more incredulous I became. As I studied the interactions of its denizens, they became familiar yet alien friends* " (Bruton, 2015:1). The rocky shores and tidal zones encompass the intricacies of tidal rhythms, adaptation and survival and species interactions, and challenge the human perceptions of organisms and species classifications.

CHAPTER FOUR: PLASTIC

The vitality of the ocean and water and the associations of wonder and curiosity were considered in Chapter Three. Chapter Four, therefore, contemplates the contrastingly dismal truths surrounding marine plastic pollution. Against the backdrop of storytelling, scientific endeavour, biodiversity and "shimmer" is the stark reality of the negative impacts that humankind's consumption has on our natural resources and environments. In contrast to the natural and organic subjects discussed in Chapter Three, is the synthetic and inorganic subject that is contemporary plastic.

In his 1957 essay, "*Plastic*", Roland Barthes describes plastic – at the time a relatively novel material in the lives of everyday consumers – as a "miraculous substance", suggesting plastic is "*... less a thing than the trace of a movement*" (Barthes, 1972:97). Today, the plastic "movement" allows approximately eight million metric tons of the 320 million tons of plastic produced yearly to land in oceans and fresh waterways (Siegle, 2018:10). Plastic has become an unavoidable component in everyday life and managing the pathways it travels after production and consumption in a sustainable, environmentally friendly way faces many challenges. It is estimated that, by the year 2050, there will be more plastics in the ocean than fish (Siegle, 2018:10). This is ironic when considering the ocean being synonymous with ideas of mystery and the unknown. It means that, in less than 30 years, the ocean could become more flooded with familiar and un-mysterious human-made plastics than anything of potential mystery or curiosity.

The topic of plastic pollution would require more than a single chapter thus I aim to navigate this topic in terms of areas of particular interest to this project. This part of Chapter Four starts with "Marine Plastic Pollution: A Brief Overview", which discusses a brief history of the production of plastic and its impacts on marine environments. This is followed by "A Call for Beach Clean-Ups", which contemplates specifically upon beached plastics. Lastly, "Reviewing Human Behaviour" broadly considers human behaviour with regards to plastic pollution as well as tactics that could be employed to deal with such pollution. In the latter two sections of this chapter, a personal interview

with Hayley McLellan[16] of the Two Oceans Aquarium is utilised to unite the discussions. Various artworks are also considered.

4.1. Marine Plastic Pollution: A Brief Overview

This project aims to highlight moments that are less obvious and out of plain sight, and this applies to my encounters with plastics along various beaches in Cape Town with a focus on marine forms of plastic pollution. This section considers the origins of the use and production of plastics before briefly providing a general account of its impacts on global marine environments.

In 1955, the advertisement seen below (Figure 17) appeared in Life Magazine. It depicts a family happily tossing plastic items out of a trash can and into the air, prompting enthusiasm for the new "throw away" lifestyle that plastics allowed and the convenience that accompanied single use plastics (Parker, 2018:48). A little over half a century later, photographer Justin Hoffman captured an image off the island of Sumbawa of a seahorse latching to a plastic earbud (Figure 18). Seahorses have been known to latch onto organic matter, such as sea grass, in order to ride tidal currents, and the image of the vulnerable seahorse holding a discarded man-made product later appeared in the 2018 National Geographic edition aptly titled "*Planet or Plastic*". In fact, Hoffman's photograph appeared directly behind the image of the 1955 Life Magazine advertisement, on pages 47 and 48 respectively. Hoffman's photograph shows the catastrophic impacts that plastic pollution is having on our natural environments compared to the smiling faces of the family depicted in the Life Magazine advertisement. The contrast between the two images is startling. It links back to Morton's (2016) accounts of the darkness that accompanies ecological awareness as the images depict the effect of unsustainable human plastic consumption.

[16] This interview was conducted by myself and occurred on 1 June 2020 via WhatsApp voice-notes.

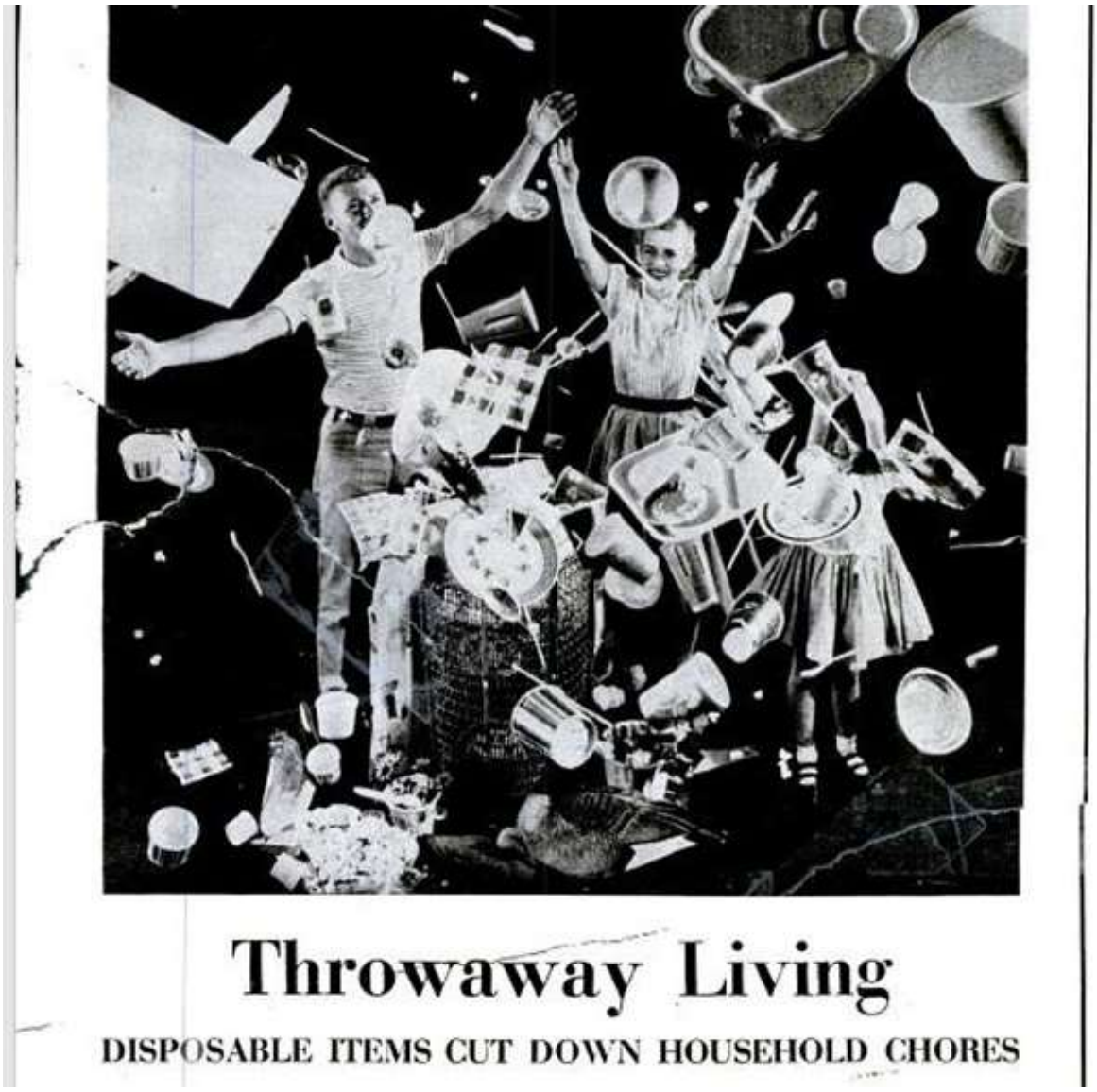

Figure 17. Advertisement from Life Magazine (1955).

Figure 18. Justin Hoffman, *Seahorse with Q-tip* (2018).

"Plastic" refers to materials that are malleable and that can be moulded or shaped by pressure and heat (Science Museum, 2019). Despite the common association of plastics as synthetic or human-made materials, forms of natural plastics, such as rubber, horn, amber or shellac, have been used by humankind for centuries (Science Museum, 2019). As noted on their website, The American Chemistry Council ([Sa]) describes how contemporary plastics comprise materials that typically have a high molecular weight and include elements such as carbon, hydrogen, oxygen, nitrogen, chlorine, and sulphur. Synthetic plastics were created to imitate naturally occurring materials that also have a

high density weight, such as wood and horn. This is noted by Barthes, who laments how the role of plastics as "imitators" became accepted:

> "The fashion for plastic highlights an evolution in the myth of "imitation" materials…. until now imitation materials have always indicated pretension, they belonged to the world of appearances, not to that of actual use; they aimed at reproducing cheaply the rarest substances …. Plastic has climbed down, it is a household material" (Barthes, 1972:97).

While images such as Hoffman's seahorse iterate the negative impacts that many contemporary plastics have on natural environments and their inhabitants, earlier forms of plastics and their "imitation" of organic materials actually provided a level of relief for certain species. In the late 1860s, large numbers of animal species were hunted in order to obtain vast amounts of cow horn, mother of pearl, ivory or tortoiseshell needed to produce buttons for garment making. The use of tortoise shell, which came, in fact, not from tortoises but rather from hawksbill sea turtles, reached an intense peak during the Victorian era as they were used to create a variety of highly in demand products, such as tortoiseshell hair combs, belt and shoe buckles, snuff and trinket boxes, picture frames and jewellery. This resulted in intense strain on hawksbill sea turtle populations (Siegle, 2018:30–31). The invention and subsequent use of Parkesine – a material considered to be the first human-made plastic – provided an economical alternative to ivory and tortoiseshell (Science Museum, 2019) and brought relief to hawksbill turtle populations. Although still critically endangered, Lucy Siegle, author of *Turning the Tide on Plastic Pollution: How Humanity (And You) Can Make Our Globe Clean Again* (2018), asks the question: "*Without Parkesine – and the subsequent plastics by which it was soon eclipsed – would the hawksbill sea turtle have become extinct?*" (Siegle, 2018:31). This is a noteworthy observation about plastic consumption as it shows that the production and consumption of certain plastics can at times be beneficial for natural environments.

This initial introduction and use of plastic, at the time a semi-synthetic material based on natural substances,[17] may have benefited the natural world by providing relief to certain natural resources. However, semi-synthetic plastics soon evolved into completely synthetic materials and the demand for them exploded by an unprecedented degree. In the 1860s, the demand for ivory to produce billiard balls was, similarly to the hawksbill sea turtle, placing increasing strain on Asian elephant populations. Again, advances in the production and subsequent use of plastic materials provided effective substitutes and the invention of completely synthetic Celluloid became an economic alternative to ivory, as well as being used in other products such as dental plates (Siegle, 2018:32). The advent of completely synthetic plastics also includes the invention of Bakelite plastic, the first thermosetting plastic that could be heated and shaped (Siegle, 2018:31). Bakelite plastic emerged in the early 1900s and generated a demand for affordable yet desirable products that could be produced from the material, such as telephones, cameras and radios (Science Museum, 2019).

During the 1900s, chemical experimentations took place with the aim of expanding the production and use of plastics. "*As the chemistry progressed, substances that originated in a chemist's test tube, rather than mined from the earth, were shown to be stronger than steel. Plastic could be produced with specific properties, such as extreme heat resistance*" (Siegle, 2018:33). In the early 1930s, attempts were made to combine ethylene and benzaldehyde by using great amounts of pressure and heat. While these experiments failed, a leak of oxygen resulted in a white, waxy substance found in a reaction tube. The substance was a polymer of ethylene and this discovery resulted in what is now the world's most abundant plastic: polyethylene. It was regarded as a wonder material as it was both flexible and strong (Science Museum, 2019). At the same time, various other individual discoveries, such as Cellulose, Acetate, Phenolic, Amino plastic and Nylon were grouped together under the term "plastic" (Siegle, 2018:33). Hugely successful consumer products that resulted from these discoveries were nylon stockings, Tupperware and plastic shopping bags. Additionally, polyethylene plastic was

[17] As noted on their website, the Science Museum explains how patents of the time for semi-synthetic forms of plastics were based on natural substances such as blood, milk or cork.

used to insulate radar cabling during the World War II (Science Museum, 2019) and other plastics were useful during the war, such as the use of transparent plastics in protective gear (Siegle, 2018:24). This bolstered public opinion of plastics and, by the year 1950, scientific research of polymerisation – the process of plastic creation – won scientists Karl Ziegler and Giulio Natta a Nobel Prize (Siegle, 2019:34). Five years later, the "throw away" lifestyle advertisement appeared in Life Magazine.

In his book, *Plastic Soup: An Atlas of Ocean Pollution*, Dr Michiel Roscam Abbing notes the changes that were brought by the introduction of plastics into the lives of everyday consumers:

> "Plastic waste is a mirror that reflects the throw-away society that quickly emerged after the Second World War. Increasing numbers of more traditional products were replaced by plastics… Thanks to low prices, it no longer matters if a plastic product is used only once or if it soon breaks" (Roscam Abbing, 2019:6).

Certain plastics replaced not only precious materials, such as mother of pearl, ivory or tortoiseshell, but also the very idea of "preciousness" itself. While early uses of plastics as substitutes for natural materials provided a degree of relief to natural environments, the "throw away" lifestyle that accompanied the plastic movement has resulted in plastic waste that is negatively impacting natural environments. Since their invention, all plastics that have been created are still in the environment in some form. The average useful lifespan or "working life" of cheap plastic products is short and items with longer working lifespans are exceptions (Roscam Abbing, 2019:6). The average working lifespan of a plastic shopping bag, for example, is believed to be around 15 minutes (Parker, 2018:45). All plastic items become a form of waste at some point, and many cheaper plastic items are deliberately manufactured with the aim of making them easily disposable. Landfills, where vast amounts of disposed plastics end up, contribute to plastics landing in the ocean, which is sometimes referred to as "plastic soup".

The lightness and durability of plastic that was once so admired now contributes to marine plastic pollution as plastics are easily blown or washed away. Furthermore, it takes long periods of time for plastic items to degrade, with a plastic shopping bag taking about 20 years and a PET (polyethylene terephthalate) bottle about 400 years. Once in the ocean, however, plastics do not degrade and instead

form miniscule particles or micro plastics (Roscam Abbing, 2019:11). As an estimated 22 to 43 percent of all used plastics worldwide are bound for landfills, it is unsurprising that so much stray plastic eventually accumulates in our seas (Roscam Abbing, 2019:11).

While some plastics such as PET – of which many drinking bottles are made – sink to the bottom of the sea, other plastics remain buoyant and drift along the ocean's surface (Roscam Abbing, 2019). These drifting plastics represent only a small portion of marine plastic pollution as, according to Siegle (2018), approximately 70 percent of plastics that enter the ocean sink to the ocean floor. The other 30 percent remains at the surface or travels to coastal shores (Siegle, 2018:66). Plastics that remain afloat can accumulate within circulating movements of water called gyres, which result from clockwise rotations in airflow and surface currents (Siegle, 2018:57).

> "This is what we have discovered about the movement and behaviour of plastic trash out at sea – once the detritus enters the ocean currents, the buoyant plastic is inclined to settle in islands of trash that float just above the surface. It is here, where winds are light, that the plastic debris of our throwaway lives is dramatically visible" (Siegle, 2018:57).

The most famous example of such an accumulation of plastic in a gyre is the Great Pacific Garbage Patch (GPGP) which was discovered in 1997 by yachtsman and oceanographer Captain Charles Moore, who consequently went on to research and raise international awareness regarding such accumulations of marine based plastic (Roscam Abbing, 2019:18). While the name "garbage patch" is perhaps misleading as to the true nature of this vast and shifting accumulation of plastics, many of which are not immediately visible to the human eye (NOAA, 2019), the GPGP has increased dramatically. It is now estimated to contain in the region of 1.8 trillion pieces of rubbish – the majority of which are plastics (Siegle, 2018:59).

Estimates regarding the potential increase in future amounts of plastics in the ocean explain the belief that there could one day be more synthetic, human-made waste in the oceans than fish. In 2015, an estimated 50 million metric tons of plastic was believed to exist in the ocean, which could triple to 150 million tons by 2050 (Siegle, 2018:54). Even the ocean's deepest point, the Mariana Trench, contains plastic (Siegle, 2018:17). This is particularly noteworthy if one considers perceptions that the

ocean is so expansive that anything entering it will become "dispersed into oblivion", as noted by Aliamo (2014). Marine plastics may disperse far beyond the reach of most humans, but they do not disappear, and nor do their impacts on natural environments. In 2017, 1220 animal species were known to be negatively impacted by marine plastics (Roscam Abbing, 2019:43). Marine creatures and birds can become entangled in plastics or ingest them as plastics also visually imitate the food sources of various marine species. An example of this can be seen in the photographs of Chris Jordan who documented the plastic filled stomachs of Laysan albatrosses in the islands of Midway (Figure 19). Many plastic lighters are found in the protected area of Midway, and it is believed that albatrosses mistake these lighters for small squid or that strings of fish eggs become attached to them (Roscam Abbing, 2019:26). Another example is that sea turtles can mistake transparent plastic bags for jellyfish. According to Roscam Abbing (2019), all marine turtles ingest plastic (Roscam Abbing, 2019:43), noting an example of a green sea turtle who was found with 3,267 pieces of plastic in its intestines and an additional 308 in its stomach.

Furthermore, plastic items become entangled in coral reefs, sometimes limiting the oxygen supply that increases the chances of corals becoming diseased. This, in turn, impacts the species that live in coral rich ecosystems. Larger floating plastics eventually break down into microplastics that then sink to the ocean floor as they become heavier due to microorganisms that attach to them. The nature of microplastics on the ocean floor has been likened to a snow storm, with researchers estimating that four billion microplastics per square kilometre can be found on the seabed of the Indian Ocean.

Research is also being done regarding bioaccumulation and plastic's ability to bind with toxic organic substances such as PCBs and dioxins (Roscam Abbing, 2019:49). These compounds accumulate in plastics up to one million times greater than in surrounding ocean waters, further accumulating in the tissues and fat of marine species. In 2014, geologists discovered a new type of rock at Kamilo Beach in Hawaii that has since been named "*Plastiglomerate*" – a mixture of *plastic* and *conglomerate.* It is believed that this new plastic immersed rock is the result of melting plastics that become mixed with organic materials such as coral, lava, or sand.

This discovery is a shift away from the geological epoch of the "Holocene" as noted by Roscam Abbing: "*Later generations will have no difficulty dating this rock as having arisen in our age of plastic pollution*" (Roscam Abbing, 2019:54).

Figure 19. Chris Jordan, from *Midway: Message from the Gyre* (2009–present).

The realities of the side effects of human consumption with regards to plastic pollution are especially poignant within discussions about the Anthropocene and humankind's negative impacts on natural environments. As noted by Siegle, "*In human history … there was the Stone Age, the Bronze Age, the Iron Age and today we are living through the Plastic Age. But the Plastic Age is not something we can sit by and watch passively, observing as if the inexorable plastic takeover was just another natural phase of human evolution*" (Siegle, 2018:10).

4.2. A Call for beach clean-ups

About 15 percent (Siegle, 2019:66) of plastics that enter marine environments will find their way to coastlines therefore most humans only see a relatively small portion of the larger picture that is marine plastic pollution. It is this form of plastic pollution that inspired this project. This section considers findings regarding beached plastics, both locally and abroad. It accounts examples of my interactions with plastics along Cape Town's beaches, as well as efforts to bring communities together in the form of "beach clean-ups". This section also includes an interview conducted with Hayley McLellan, the Environmental Campaigner for Two Oceans Aquarium.

During a Two Oceans Aquarium Volunteer event in 2018, my fellow volunteers and I wandered around the rocky shores around Kalk Bay during low tide. We came across familiar finds: a few sea stars, barnacles tucked away under sections of freshly exposed rock and of course many anemones, their tentacles tucked inwards and bodies shrunk due to the absence of water. There were also many sea urchins, some of them characteristically hoisting bits of organic debris above themselves. What was unexpected, however, was the sight of what appeared to be a white Lego brick amidst two or three sea urchins (Figure 20). It was just above the water level, so I was not at first certain if it was floating there. Upon closer inspection, I realised that the urchin beneath it was latched onto the Lego brick and had hoisted it above itself, rather than a bit of shell or algae. At first, the beach had appeared to be clean on that day, with no obvious plastics in sight. Yet, upon closer inspection, plastics were indeed present in this insidious way and were being utilised in the same manner as debris that actually belonged there. I have since returned to that stretch of beach and come across urchins similarly latching onto other plastic items, such as bread packaging tags and plastic forks. These interactions between marine animals and plastic items is akin to Hoffman's seashore, as a creature employs tactics intended for organic materials and enacts them upon plastic waste.

Figure 20. Chloe Obermeyer, *Images from trips to Kalk Bay: Sea urchin in Kalk Bay hoisting a Lego brick above itself* (2018).

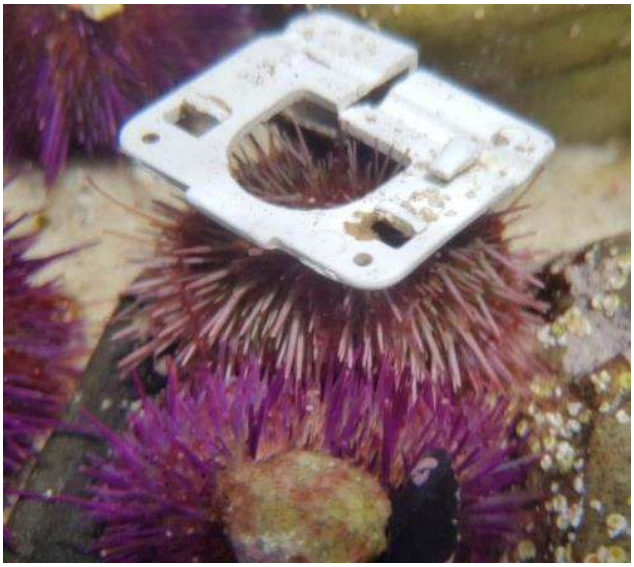

Figure 21. Chloe Obermeyer, *Images from trips to Kalk Bay: Sea urchin in Kalk Bay hoisting a tag above itself* (2018).

Figure 22. Chloe Obermeyer, *Images from trips to Kalk Bay: Sea urchin in Kalk Bay hoisting a plastic fork above itself* (2018).

Roscam Abbing (2019:20) noted, "*A beach paradise with white sand and palm trees in the Pacific Ocean – this idyllic image is etched into the mind's eye for many people, but is no longer the reality anywhere … There is no longer a single beach in the world where you will not find plastic*". Speaking with environmentalist Hayley McLellan, I noted how my memories as child do not include plastic filled beaches. McLellan noted how age may be a factor, stating: "*I was born in 1969, and I certainly do not recall much plastic on the beaches when I was young, and I spent a lot of time on the beaches*". I was born in 1991, and I wonder if an increased awareness and the shifting baseline syndrome (see section 3.2) has led me to noticing beached plastics so consistently. Those who have grown up with or are often around beaches filled with plastics may not register plastics as foreign, as McLellan elaborated:

> "I do agree that because of the awareness that is now out there, people will be noticing it more … The thing is, [*plastic pollution has]* always been there; you would think that I would have noticed some plastic then, but ja… probably the odd sweetie wrapper, you know, in the waves when we were body boarding, but not this onslaught, you know, where you walk on a public beach and it's just everywhere".

Each country or city's contribution to marine plastic pollution varies, depending on the infrastructure, population size and the presence/effectiveness of waste disposal systems. On some beaches, the amount of visible plastic pollution is staggering. Kamilo Beach in Hawaii, for example, has become known as "Plastic Beach", with plastic deposits as deep as 10cm in certain areas (Roscam Abbing, 2019:20). On beaches near the coastal city of Durban, vast amounts of plastic waste are visibly present at the waterline, often following heavy rainfall (Roscam Abbing, 2019:20). As noted on the website "Durbanites against Plastic Pollution" (DAPP): "*Litter and dumping are commonplace, weak collection systems characterise impoverished areas, the city has an undeveloped recycling culture and a number of polluted rivers and waterways enter the sea*."

Plastic pollution on beaches, such as microplastics and nanoplastics, is not always visible to the human eye as it often blends in with other matter such as sand. Furthermore, the breaking down of plastics and the process of fragmentation is accelerated along rocky shores, due to wave force and sunlight. Plastic pollution in marine environments comes from many sources, including recreational activities, construction, agriculture, fishing and shipping. A particularly resonant example of plastic pollution via shipping mishaps is what has become known as "mermaid tears" as, in Chinese fairy tales, it was said that the tears of mermaids turned into pearls, hence the name given to these white or silver-like plastic pellets. These are Polypropylene pellets usually up to 5mm in size that are used as raw material for the creation of plastic products and are thus transported via land and in shipping cargos worldwide. These pellets are often lost during transportation and have become abundant forms of plastic pollution in both inland waters and marine environments. In 2012, a typhoon resulted in six shipping containers of pellets going overboard and, as a result, millions of these plastic pellets washed ashore along coasts near Hong Kong. Thousands of volunteers joined beach clean-up efforts and industrial vacuum cleaners were also utilised. In the end, it is estimated that approximately 70 percent of the "mermaid tears" were removed (Roscam Abbing, 2019:36–37).

Beach clean-ups have become prominent forms of community efforts to attend to plastic pollution along costal shores:

> "Over many years, beach cleaners around the world have painstakingly, quietly and sometimes not so quietly cleaned up and collected evidence of the plastic pandemic. The hauls have been collated and analysed, and the data, with its shocking figures, represents powerful, citizen-led scientific proof in the campaign to stem the tide" (Siegle, 2018:67).

The Two Oceans Aquarium run six such clean ups yearly or, as they call them, "Trash Bashes". This gives Capetownians an opportunity to come together in an effort to combat plastic pollution. McLellan maintained:

> "We love bringing people together and people love the aquarium …. so we get a lot of support ... They want to get out onto the beaches and engage there …. getting down up close and personal with beach litter, especially the microplastics. It's a transformation of one's being because you just realise this is for real and it's everywhere and it's seemingly insurmountable …".

She further notes the sense of encouragement that people feel when coming together for beach clean-ups. While certain plastics are indeed too small to be collected, I would argue that such clean-ups effectively raise awareness regarding plastic pollution and provide individuals with a means to take action, rather than simply being overwhelmed by the huge amounts of plastic waste. Additionally, partaking in such clean-ups is an effective act of care towards the natural environment. It also links back to Stern's (2018) views of Ecological Aesthetics, and a framework that asks us to consider what we do and how we move within the environment, as McLellan responds: "*I love that central idea of interconnectedness and that's exactly what we've lost, is that connection with nature*". She also notes that her description of someone who shows care towards their natural surroundings is inclusive of individuals who actively immerse themselves within natural surroundings and enjoy being in such surroundings. McLellan explains how partakers in beach clean-ups are usually very interested in the statistics and the citizen science[18] that accompanies these efforts by paying attention to documenting

[18] "Citizen science" comprises contributions to scientific data or research from non-professionals, such as the general public.

the types of plastics that are found. The types of plastics collected during beach clean-up efforts depend on many variables that impact the accumulation of plastics on beaches. They include whether the City of Cape Town has cleaned a particular beach, if the beach is prone to being a "wash up" location due to ocean currents, and if a beach is more prone to micro or macro litter. For this reason, different locations and beaches are chosen for clean-ups.

At the end of each Trash Bash, the collected documentation is handed over to the Beach Co-op. As noted on their website,[19] the Beach Co-op is a non-profit company that aims to combat single use plastics. The scientific advisor for the Beach Co-op is Professor Peter Ryan, who has been conducting extensive research regarding plastic waste the on beaches and shores of South Africa since the 1980s. As the collection and documentation of plastics on beaches is the most effective way of collecting data regarding plastics at sea, Professor Ryan created the "Dirty Dozen" concept and program. The Dirty Dozen are 12 types of plastic litter that are commonly found along shores of South Africa that have been selected in order to track marine waste and litter. These are: cool drink bottles, water bottles, cool drink lids, plastic bags, chip packets, sweet wrappers, straws, ear buds, lollypop sticks, cigarette lighters, fishing line and lightsticks. As noted by Professor Ryan:

> "Founder of The Beach Co-op Aaniyah Omardien wanted her organisation's clean-ups to generate more than awareness and a short-term respite from the flood of litter washing ashore. She wanted to contribute useful data on the extent of the plastic 'problem' and help to assess what measures taken to tackle the problem were making a difference. The Dirty Dozen items were chosen as indicators of the main sources of beach litter from fisheries and ships, local land-based sources and beach users" (Ryan, 2019).

In 2018, volunteers in Dirty Dozen beach clean-ups collected 100 000 Dirty Dozen items (Ryan, 2019). With reference to Hoffman's seahorse and its infamous earbud (Figure 18), the Beach Co-op website specifies that 13 446 earbuds have been collected in the 100 clean ups that have occurred since the organisation's formation in 2015. Sweet wrappers were the most abundant item collected, at

[19] The beach Co-op website address: https://www.thebeachcoop.org/

36 634, followed by cool drink lids at 32 875 and plastic straws at 25 270. One thousand, five hundred and eighty-two plastic lighters were collected at the same time.

The Beach Co-op was founded when a group of volunteers started collecting litter every new moon along the 130 metres of rock pools at the Surfers Corner in Muizenberg. These clean-ups still occur at every new moon. The amounts of plastic ingested by anemones along that strip of shore are also recorded during the clean-ups. I have seen instances where *Bunodactis reynaudi* or Sandy Anemones are ingesting bits of plastic. I once accompanied marine biology student, Christie Munro, who is studying this phenomenon, to that particular strip of shore along Muizenberg. Studies regarding this occurrence have noted that Sandy Anemones seem to favour flexible plastics, such as packaging items and shopping bags. They also appear to prefer biofilm coated plastics, i.e., plastics with organic matter growing on or attached to them (Munro, 2020). The ingestion of plastics through the central mouth of Sandy Anemones presents serious threats to these animals, as the plastics trick them into believing that they are full and satisfied while providing no nutrition. This, combined with the potential ingestion of harmful chemicals, could result in weakened immune systems (Munro, 2020) as synthetic plastics are mistaken for organic, local matter by sea creatures.

The vast amounts of plastics that enter marine environments and coastal shores are effectively captured in the photographic work of Mandy Barker (Figures 23, 24 and 25). For over a decade, Barker has been working with scientists with the aim of raising awareness of marine plastic debris and pollution, hoping that her works will result in viewers taking action:

> "The aim of my work is to engage with and stimulate an emotional response in the viewer by combining a contradiction between initial aesthetic attraction along with the subsequent message of awareness. The research process is a vital part of my development as the images I make are based on scientific fact, essential to the integrity of my work." (Barker, [Sa]).

The juxtapositioning of the visual appeal of a work with the disturbing reality it represents relates to my art making for this project. The visual qualities of collected plastic waste and the artistic capturing thereof can often produce aesthetically pleasing results, which adds further friction when contemplating the unappealing subject of marine plastic pollution. In her series, "*Soup*" (Figures 23

and 24), Barker directly addresses plastic soup and plastic debris in marine environments. The plastics recorded in each image within this series on her website were recovered from beaches worldwide, representing "*... a global collection of debris that has existed for varying amounts of time in the world's oceans*" (Barker, [Sa]). Many of Barker's images have a cosmic quality as well as a sense of movement or immersion within the contents of the images. The deceptive visual appeal of the plastics in her works – many of which are distorted or even minuscule – are reminiscent of molecules, particles or light rays. In her work, "*Hong Kong Soup: 1826 Spilt*" (Figure 25), Barker addresses the "mermaid tears" resulting from the 2012 plastic pellet spill amongst the beaches around Hong Kong. This work captures these pellets in a manner reminiscent of the night sky, a pleasing visual that greatly contrasts with the unpleasing reality behind the millions of pellets that polluted those shores.

Figure 23. Mandy Barker, *Soup: Refused* ([Sa]).

Figure 24. Mandy Barker, *Soup: Translucent* ([Sa]).

Figure 25. Mandy Barker, *Hong Kong Soup:1826-Spilt* ([Sa]).

Because I have taken part in the Two Oceans Aquarium "Trash Bashes", I can account for the feeling of positivity that accompanies a group of individuals coming together in an attempt to bring change. However, the feeling of coming across plastic waste when on a beach alone or for a recreational activity can be quite defeating. Having lived in Sea Point, Cape Town, for a long time, McLellan noted: "*As much of a beach lover as I am, I don't think I walked on Sea Point Beach 10 times in eight years because I just could not handle being faced with plastic every single step*." It was similar feelings of being overwhelmed by beached plastics that motivated this research and the art works that accompany it, as I attempt to grapple with such realities.

4.3. Reviewing Human Behaviour

The rise of plastic production and consumption has been discussed, as well as the impacts of plastic pollution on marine environments and coastal shores. I have shown how the "throw away" lifestyle has impacted consumerism and how many cheap plastic products are designed to be temporary and discarded. In this section of the chapter, I consider the human mind-sets and actions that are attracted by this "throw away" lifestyle and tactics that human beings can adopt in response to plastic pollution in the oceans that can have positive impacts for future environments assisted by Haley McLellan and her experiences regarding such matters.

I asked McLellan about her history and her past work with marine birds and animals. She informed me that her

> "primary passion is animal care and behaviour, I love the [studying] the behaviour of animals and, through the animals, I learnt more about their natural environment which, obviously, I came to realise is our natural environment; it's our life support system and seeing the devastation of single-use plastic all these years, it built up something inside of me".

McLellan stopped using plastic shopping bags in 2008 when she became aware of what she describes as "problem plastics" – single use plastics which are intended to be discarded. Expanding upon her current work as an environmental campaigner as well as an educator for the Two Oceans Aquarium, she further notes :"*I'm essentially still working with animal behaviour, the animal has changed*

though, it's the human – human behaviour".

I would argue that single-use plastics appeal to human nature for their time and money saving convenience. Single-use plastics avoid the need to plan ahead or clean up afterwards. Plastic bottled water, for example, replaces the need for a bottle to be filled beforehand and cleaned after use. Other examples include disposable plastic items such as cutlery, coffee and beverage cups, food packaging, personal care products and beauty products.

The convenience of plastic is, however, being overshadowed by the negative impacts that plastic waste is having on natural environments (Roscam Abbing, 2019:1). I asked McLellan whether marine plastic pollution is overwhelming for most people and what can be said to those who may feel that their individual actions cannot make any difference to this reality. She agreed that it is a daunting subject for most people who are aware of the problem but simply do not know how to address it: "*It's so super important for people like me, and activists, and organisations like the Two Oceans Aquarium to make it simple and break it down into manageable steps – because if we don't, I think people will put their head in the sand and do nothing anyway".* While McLellan noted how people are usually well intentioned and re-iterated how intimidating the mental shift towards a sustainable use of plastics can be, she also asserted how "*...we can't keep making excuses*". She suggested that asking people to change their spending habits and the items they purchase, can result in a level of inconvenience that is not always well received. McLellan recalled how one mother's reaction to the idea of no longer using plastic shopping bags was that it was a waste of her time and that she had other concerns to attend to. McLellan added that humans have a tendency to only address a problem when it influences them directly: "*If a crisis does not affect a person immediately, like, within their own frame of context, then it doesn't seem real to them*". She observed that the water crisis experienced in Cape Town around 2018 resulted in Capetonians adopting dramatic changes to their behaviours as the threat of Day Zero was so tangible: "*I think if we could almost adopt a similar approach to plastic waste as we did to an impeding drought and a doom and gloom situation, we might be able to shift people's behaviours around plastic too.*"

Plastic water bottles contribute to marine plastic waste but, to consumers, they are convenient and easily discarded. However, the fear of polluted or impure water can promote the purchase of bottled water. In his book, *Bottled and Sold: The Story behind our Obsession with Bottled Water* (2010), Peter H. Gliek explains how companies that produce bottled water take advantage of public scepticism regarding water quality: "*... people can be made to fear the quality of the water that comes out of their taps. We don't know where it comes from. We don't know what's done to purify it… As a result, many people seek out alternatives, and the bottled water industry is happy to take advantage of this distrust*" (Gliek, 2010:17). This relates to a statement made by the City of Cape Town in late 2019 in which they reassured residents, many of whom were nervous about tap water quality following the drought that a new "earthy" taste in the tap water was due to an increase in geosmin and was in no way a health concern (Maphanga, 2019). During the Cape Town water crisis, the purchase of bottled water greatly increased and five litre water bottles became visually synonymous with the water crisis. Gliek further notes how many plastic bottle companies and producers combat critiques regarding the use of plastic with the argument that PET plastic is recyclable, and thus environmentally friendly (Gliek, 2010:96). Gliek contest this by noting: *"… 'recyclable' is not the same as 'recycled.' Water bottles are almost all recyclable, and yet most of them are never recycled*" (Gliek, 2010:97).

Recycling has been regarded worldwide as a means of combating plastic pollution. As noted by McLellan, many of us have grown up with the mantra "Reduce, Re-use, Recycle". However, not all plastics are recyclable or easily recyclable. Many recyclable plastics are also used to create non-recyclable items, called "open-loop recycling", while the ideal form of recycling is "closed-loop recycling", which broadly refers to the process of allowing recyclable items to continually become used to make the same recyclable item (Siegle, 2018:45–46). Noting complexities regarding recycling and waste disposal in the United Kingdom, Siegle explains: "*While it's ostensibly great news that we all want to recycle more plastic, the truth is that we don't have the capacity to process it … we only have the capacity to recycle 350,000 tonnes a year – only seven per cent of what we use"* (Siegle, 2018:45*)*. This sentiment is shared by McLellan, who maintains that recycling should be the last item in the hierarchy of solutions, stating "*We are not going to recycle our way out of this mess*". This idea

of a hierarchy of possible solutions to the problem of single use plastics and plastic pollution links back to McLellan's idea of breaking information and actions into manageable amounts. It allows individuals to contemplate actions against the insurmountable realities of plastic pollution.

Contemplating possible ways of re-evaluating approaches and mind-sets regarding single use plastics, McLellan suggests:

> "It's probably a good idea to start off with Respect. Respect this environment that we have been given and all of its resources. How about, Refuse next, so refuse as much unnecessary packaging as possible. Then begin to Reduce or Re-use … reduce how much you accept or purchase from the stores, because we can't entirely get away from plastic".

Professor Ryan notes:

> "We're not advocating giving up plastics – they are an essential part of our modern society, and switching to alternatives in many cases would result in much greater environmental impacts than continuing to use plastics. But there are certain applications where you can just say 'No'" (Ryan, 2019).

In addition to her suggestions of the sequence of Respect, Refuse, Reduce/Re-use, McLellan continues: "*After Re-use, how about Re-think, Re-invent, Re-purpose, Re-home, Re-design our current concepts that are not working ... the list is endless, and, seriously, at the bottom, Recycle*". Similar sentiments are expressed by Siegle, who states: "*Building on the age-old framework of Reduce, Re-use, Recycle, I'm proposing four more practical strategies that we can begin to act on today – conveniently, they also begin with the letter R*" (Siegle, 2018:84). She suggests the following strategy: Record, Reduce, Replace, Refuse, Re-use, Refill, Re-think and, at the end, Recycle.

Within his Ecological Aesthetics framework, Stern considers the idea of a "tactic" and suggests that it is a response to a situation or environment, usually within a short span of time. "Tactics", for Stern (2018:46), are consistently evolving and shifting actions that are altered in accordance with our experiences and relationships within our lived-in environments. With this in mind, McLellan and Siegle have shifted and re-evaluated the tactic of "Reduce, Re-use and Recycle" and provided alternative tactics that allow individuals to respond to the needs of their surrounding environments by

re-considering their behaviours and the plastic waste that may accompany these. While I will not elaborate on each possible tactic that humans could employ to reduce their consumption of unnecessary plastic products, I will note three very simple ones. Siegle (2018:84) suggests that "Record" is a means of tracking plastic consumption in order to reduce it. I would argue that "Record" could also be seen in the Dirty Dozen clean-up approach, where the types of plastics that are documented and recorded lead to increased knowledge and data regarding the pathways of various plastic items. "Re-use" is a call for the act of refusing the "throw away" mentality and purchasing re-usable plastic items with a long or longer working life. Siegle (2018:84) describes "Replace" as a call to "*swap out the ecological hooligans that have colonised your store cupboard, gym bag and commute to work, and swap in the cool high-function, low-impact alternatives*". "Refill", for Siegle (2018:118), is a call to employ the "*... refillable culture [that] was once completely instinctive. Only a generation ago, mandatory deposit schemes for bottles and refillable containers were commonplace*". Purchasing a re-useable water bottle and refusing bottled water is an obvious example of this, similarly with warm beverage containers, such as disposable coffee cups, by supporting consumer outlets that allow buyers to re-fill empty containers.

The concept of Re-use, Re-think or Re-invent leads to Yevgeniya Kaganovich's installation series "*Grow*" (Figures 26, 27 and 28) and how it gives new life and meaning to discarded plastic shopping bags. Speaking of this ongoing series of time-based installations, Stern notes: "*The artist collects, and additionally asks us to collect and then give to her, the plastic bags that we use and sometimes re-use (usually as small garbage bags), and then most often wind up throwing into dumping grounds, presumably forever*" (Stern, 2018:182). Kaganovich disrupts the pathway that plastic bags travel from consumption to landfill – and most possibly marine environments – by utilising them to create organic forms that she allows to grow by adding to them. In this way, a form of life is given to a synthetic, lifeless plastic item while visually alluding to organic growths within nature. By fusing several layers of plastic to create an almost skin-like surface, Kaganovich moulds and forms these into structures that are part creature, part animal. Stern notes how they could be viewed as onion-like growths while, at the same time, alluding to corals or oceanic creatures (Stern, 2018:182). As more characters are

added and the series grows, a strange reality is presented as the idea of growth can be both positive and negative. While the growth of organic matter may be viewed as positive, the "growth" or increased use of synthetic plastics is more complex. "*Grow*" effectively merges the visual pleasure of ideas of sprouting, branching or rooting while also representing the "growth" in the consumption of plastic items that are used to create these forms.

Figure 26. Yevgeniya Kaganovich, *Details of Grow* (2016).

Figure 27. Yevgeniya Kaganovich, *Details of Grow* (2016).

Figure 28. Yevgeniya Kaganovich, *Details of Grow* (2016).

Grappling with the realities of plastic pollution and the human behaviours that cause it can be overwhelming. I am encouraged, however, by McLellan's assertion of a growing awareness and response to such matters. She explains: "*The growing awareness, where I was always feeling like I was seeking audiences, I now have people approaching me all the time, and it's amazing … I now receive daily communications coming at me …*". This suggests a sense of momentum and an eagerness for individuals to adopt tactics to address the complexities of beached plastics and marine plastic pollution.

CHAPTER FIVE: AT LOW TIDE

In the previous chapters, I have outlined the parameters of this project, considered relevant seminal voices and thoughts, reflected upon ideas of wonder and curiosity, and noted dismal realities regarding plastic pollution in marine environments. In this chapter, the culmination of this research is shown through my art-making and artworks. This chapter considers how my art-making has adapted and evolved in light of the ideas discussed in the prior chapters by expanding upon my chosen alternative photographic mediums. This project was a result of my personal responses to my immediate surrounding environments which included the water shortages during the 2017/2018 Cape Town water crisis and my observation of the rocky shores of Cape Town's beaches. In this chapter, I note various visual and conceptual parallels between my art-making processes and the subjects that are depicted within my works. Additionally, as I assume the roles of both artist and researcher, this chapter also briefly considers the various limitations in my navigation of alternative photographic processes and their chemistry. This chapter also considers intersections between scientific and artistic languages.

Chapter Five begins with "Creating with Water", which considers the origins of the cyanotype process and its lineage with botanist Anna Atkins, while also noting the use of water within the creation of cyanotypes, lumen prints and polaroid emulsion lifts. This part of the chapter also notes the visual and practical interchanges between art and science regarding such processes. This is followed by "Care in Creativity", which notes ideas of care and how these became prominent within the art-making for this project, both in the collection of organic data and in the practical creation of works. This section also considers how care for the environment can guide the chosen processes that artists might employ. Lastly, "Seeing Value in my Surroundings" includes my observations while on the rocky shores and in my studio, noting visual overlaps in these environments.

Figure 29. Chloe Obermeyer, *Still from Five Litre To and Fro's* [video] (2020).

5.1. Creating with Water

In Chapter Three, I consider the vitality of water and the wondrous and curious nature of the ocean. In this section, I consider the use and incorporation of water and the ocean within my art making. This section elaborates upon the practicalities of my chosen alternative photographic mediums and provides a brief history of the cyanotype process before considering overlaps between scientific and artistic visual languages and how my chosen media can effectively communicate these overlaps.

The alternative/historical photographic process of cyanotype was created by inventor, astronomer and mathematician, Sir John Herschel, in 1846. His discovery came at a time when advancements in the processes of photographic techniques were highly sought after within scientific circles. During this time, developments in chemistry and the light sensitive properties of silver and irons were being widely documented and shared. This included Sir Henry Fox Tolbot's famous calotype process. Herschel, however, was not as much interested in advancements in photography as he was in the scientific exploration of light sensitivity that led to his discovery of the cyanotype process. Essentially, cyanotypes are a result of light sensitive chemicals that are applied to a surface, exposed to ultraviolet light and then developed through oxidisation. The chemicals used are ammonium ferric

citrate and potassium ferricyanide. In the book, *Sun Gardens: Cyanotypes* by Anna Atkins (Schaaf, 2018:63), it is noted: "*The only other compound involved is one that is often taken for granted: water. Simply washing the exposed cyanotype brings out its rich blue colour and makes the print permanent*".

This sentiment of how water is a compound that is often taken for granted is relevant within this project as most, if not all, forms of analogue photography and alternative photographic printing methods require water, be it in the creation of chemistry or in the rinsing of prints. During an introduction to analogue photography demonstration in the first year of my Fine Arts Degree, I recall a lecturer standing before a photographic rinse tray and explaining how a considerable amount of water is used during the creation of film and paper-based forms of analogue photography and darkroom processing. While such forms of photography have not been primary mediums within my artistic practice, I recall the level of intricacy that accompanied the use of water within such forms of printing. Certain stages of chemistry mixing require specific temperatures of water and distilled water is often required due to the possibility of water impurities interacting with the chemicals in film or resin coated photographic paper.

During the 2017/2018 Cape Town water crisis, I wondered how individuals using such methods and their specificity regarding water quantities and qualities were able to navigate water restrictions. I realised that, although it is water intensive, cyanotype printing does not appear to need a specific water quality. I thus began to utilise "grey water" which is water collected during showers, baths or other household activities. While I could not entirely dispense with the use of clean water altogether, I found that using grey water decreased the amount of clean and thus potential drinking water needed to create prints. Eventually, I set aside my concerns that the salt content in ocean water would interfere with the chemicals on coated cyanotype paper and started collecting ocean water for printing. As much of my art is about the ocean, it seemed poetic to use the physical ocean within the creation of my works, particularly when experimentation showed that the salt content did not appear to hinder photographic development when working with the cyanotype process. In fact, the placement of water, ocean water or other organic matter directly upon sensitised cyanotype paper often yielded exciting

results while documenting these elements. This is exemplified in my cyanotype series "Water" (Figure 30), in which sensitised cyanotype surfaces were diluted and manipulated with ocean water. This soon became a prominent form of art-making within my practice as I began to favour the creation of photograms[20] of debris and matter as opposed to working with photographic negatives.

Within his ecological aesthetics framework, Stern considers ideas of a "tactic", explaining it as a response to a situation or environment, usually within a short span of time. "Tactics", for Stern, are consistently evolving and shifting actions that are altered in accordance to our experiences and relationships within our lived-in environments (Stern, 2018:46). Thus, I would argue that the need to quickly adapt to changes in my surrounding environments resulted in the tactic of utilising grey water and ocean water within my print making and artistic process.

Soon, five litre bottles that are conventionally sold containing drinking water became re-purposed as vessels to transport ocean water from the shores and into my studio as I travelled to designated tidal pools in order to fill bottles with printing water. The five litre water bottles also became visual symbols of the Cape Town water crisis as, at one point, it was specified that each individual was only allowed to use 50 litres of water a day, or 10 five litre bottles. Rows upon rows of five litre bottles became a typical sight in store aisles with tensions amongst customers rising when the numbers of these bottles would dwindle.

My work "Five Litre Highs and Lows" (Figure 31) is based upon this experience. In this series of twelve cyanotypes, I captured photograms of five litre plastic bottles that were utilised for the collection of ocean water. I also integrated organic aspects, such as water, salt and sand, upon the sensitised surfaces in order to incorporate elements from the environments in which these bottles were used as well as the matter that they came to contain.

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[20] A "photogram" can be understood as a means of capturing the shadow of an object by placing it directly above a light sensitive surface and exposing it to light.

Figure 30. Chloe Obermeyer, *Water* (2019- 2020).Cyanotypes on Fabriano paper, 22.8 x 29.5 cm each.

A linear watercolour marker runs throughout the series, reminiscent of the mapping of tides and the highs and lows of the ebb and flow of tidal currents, alluding to the changes in time along coastal shores. Sometimes I captured the bottles while they contained water; sometimes I captured them while empty. This, along with the shifting height of the watercolour "tide line", alludes to absence and presence of water, with the absence thereof being especially relevant while navigating a water crisis.

In certain prints, the bottles have almost ghost-like qualities, further heightening ideas surrounding absence or "what once was". The video piece "Five Litre To and Fro's" (Figure 29), speaks directly to my "Five Litre Highs and Lows" series as it contemplates ideas of the absence and presence of water that overlap with my experience of collecting ocean water for printing and the experience of navigating a decrease in water during a water crisis as well as during a low tide. In the piece, I can be seen walking along the shore with empty and later filled five litre water bottles as I collect ocean water for printing. These five litre bottles became examples of useful plastics and act in opposition to the problematic single-use plastics discussed in Chapter Four. These plastic items became valuable containers that were filled and refilled, usually with ocean water for printing but also at times being carefully rinsed to contain essential drinking water.

Figure 31. Chloe Obermeyer, *Five Litre Highs and Lows* (2019-2020). Cyanotypes on Fabriano paper, 35 x 49 cm each.

Using ocean water to create images about the sea, I contemplated the conceptual and visual weight inherent in the materiality of my chosen media. When navigating ideas of water and the ocean, the distinctive Prussian blue tonal ranges achieved within cyanotypes makes them an endless and imaginative playing field within my work – a quality that was once seen as a hindrance as photography was historically most prominently used to capture the human form. Schaaf (2018:66) describes it as "*a widely appealing colour, but the primary use of photography has always been for recording the human visage, and a portrait reproduced in shades of blue took on ghastly qualities.*"

However, when moving away from human subjects and into the vast expanse of the natural world in the form of the ocean, shades of blue become perfect tones. It is this factor that drew botanist Anna Atkins to use the cyanotype process as a means of reproducing scientific plates of marine algae in the mid-1800s, publishing what would later become a series of books entitled *Photographs of British Algae*: *Cyanotype Impressions* (1843–1853). This publication is an example of the intersections between scientific and artistic languages that exemplify how scientific research regarding photographic printing processes led to media that fuses scientific and artistic methods for practical application and intersecting interests in representations of the natural world. Atkins' use of cyanotype and its inherent shades of blue as a medium to capture matter within nature became the inspiration for this project. As further noted by Schaaf, "*Atkins' application was uniquely suited to the process – what would have been more appropriate as a background for portraits of 'the flowers of the sea'*?" (Schaaf, 2018:66).

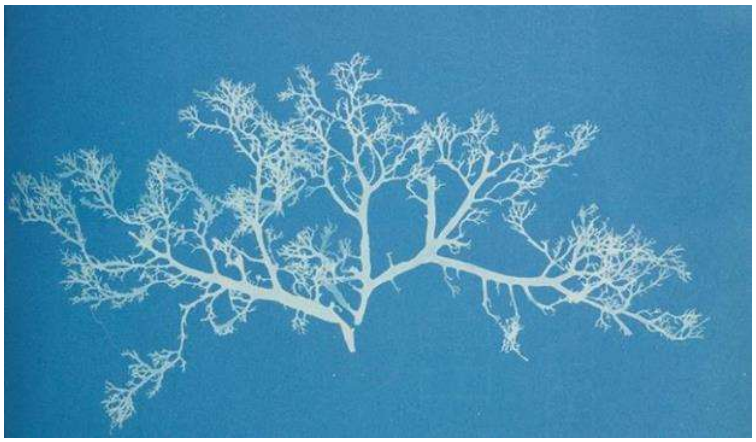

Figure 32. Anna Atkins, from *Photographs of British Algae: Cyanotype Impressions* (1843–1853).

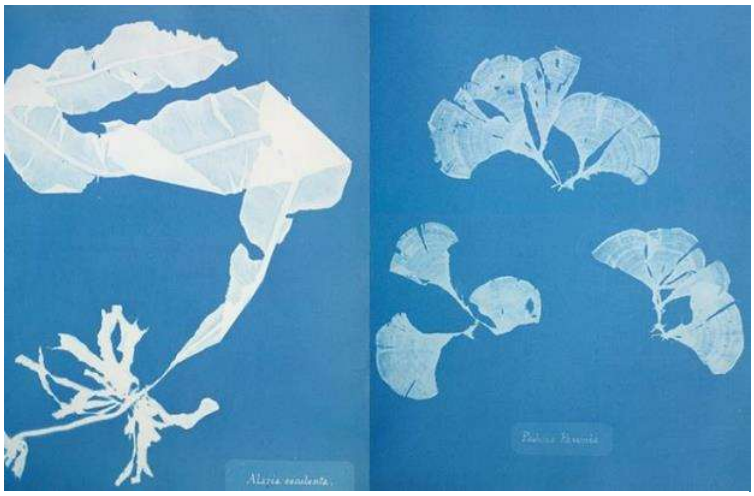

Figure 33. Anna Atkins, from *Photographs of British Algae: Cyanotype Impressions* (1843–1853).

Following Atkins' lineage, I also used cyanotypes to capture "flowers of the sea" or marine algae as well as other found species and debris that I noted during my trips to Cape Town's coastal shores. Like Atkins', I used cyanotype as a means of recording and data collection, as the medium was used to photographically record my findings and interactions with fauna, flora and matter along Cape Town's beaches. This can be noted in my work, "Field Notes: Found Ashore" (Figure 34), which is series of 12 cyanotypes recording organic matter. Many of these specimens were recorded as photograms that capture their actual size as the cyanotype medium allowed each specimen to leave a

physical record of its form. The prints in which photographic negatives were utilised were the result of scans of collected debris which were printed to scale. Unlike Atkins' *Photographs of British Algae*: *Cyanotype Impressions* (1843–1853) (Figures 32 and 33), my intention within this series was not only to document various species but also to hint as to the nature and atmosphere of the environments in which they were found. Hence, I incorporated sands, salts and movements of water within some of these prints with the aim of elevating them to be beyond purely representational images of fauna and flora. Working in conjunction with this piece is the accompanying series of cyanotypes entitled "Field Notes: Sands and Froth" (Figure 35), which utilises the same techniques to capture the interchanges and intermingling of ocean, froth and sand along coastal shores. Prints within both of these "Field Notes" series were often exposed in situ on beaches and then developed in my studio. In this way, these series of works allowed the chemical interactions inherent within the cyanotype chemistry to interact with and capture the elements and debris that I encountered during my exchanges with the natural world along the coastal shores of Cape Town.

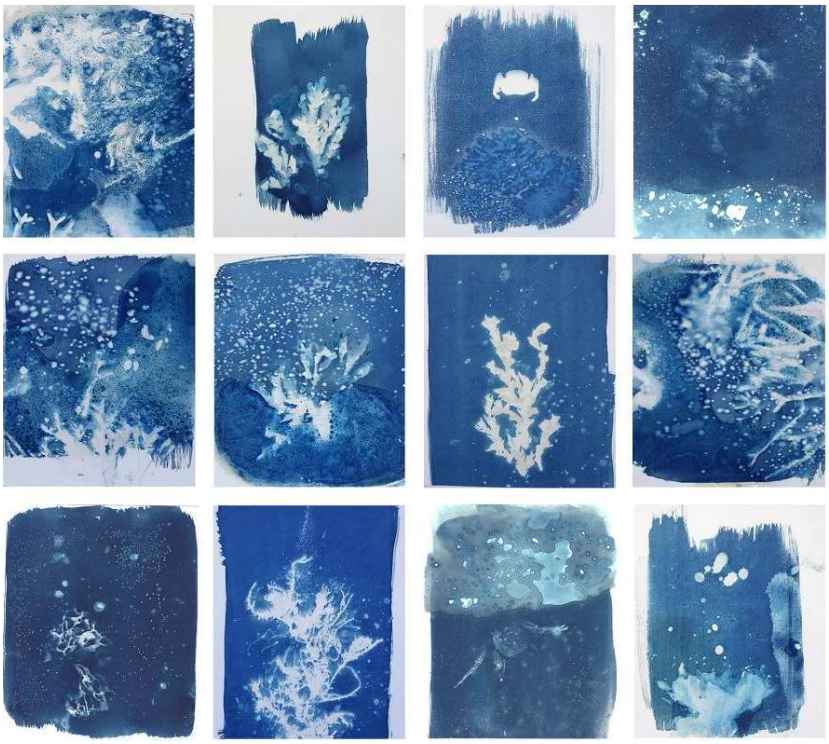

Figure 34. Chloe Obermeyer, Field Notes: Found Ashore (2019- 2020). Cyanotypes on Fabriano paper, 21 x 25 cm each.

As I created contact prints and photograms with the cyanotype process, I began to experiment with alternative methods that followed a similar approach. Thus, the documentation of found matter and organic debris was also achieved via the use of lumen printing. Lumen prints are created by the somewhat paradoxical action of leaving resin coated photographic paper – with a light sensitivity far greater than that of cyanotypes and conventionally only handled in strict darkroom conditions – in the sun for extended periods of time, between minutes and hours. Different photographic papers yield different results, as can be noted by comparing the colours and visuals achieved in prints from my "Field Notes: Illuminated Algae" (Figure 36) and "Organic and Synthetic: Illuminated" (Figure 37) series.

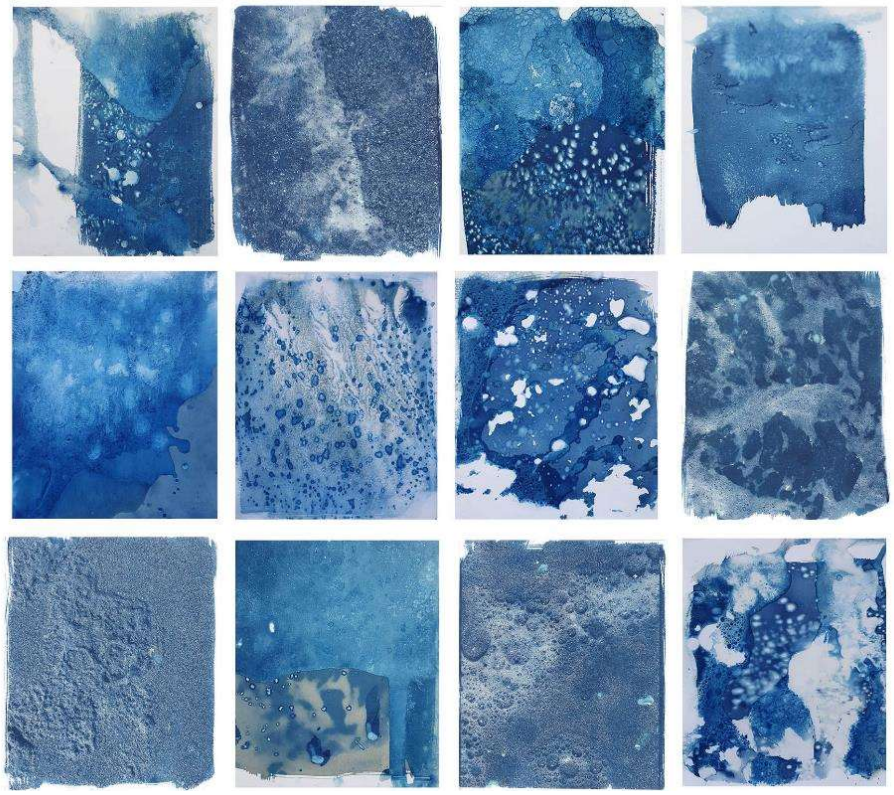

Figure 35. Chloe Obermeyer, *Field Notes: Sands and Froth* (2019-2020). Cyanotypes on Fabriano, 21 x 25 cm each.

Again, organic debris or specimens are placed above the photographic paper and exposed to sunlight before being placed directly in photographic fixer and given a brief final rinse. The results of the interactions between organic matter and the chemicals within the resin coated paper can be most unexpected as the black and white tones normally associated with such photographic paper are replaced by a variety of purples, browns, reds, beiges and golds. As lumens do not require the conventional use of photographic developer or handling in strict darkroom conditions, I found this method of printing to be fairly flexible and thus ideal within the aims of this project. Additionally, the lack of photographic developer needs less water and chemicals during production.[21] At times, the cyanotype and lumen print processes were combined to create "cyanolumens", as can also be noted in my piece "Found and Fixing" (Figure 38). This was achieved by coating resin coated photographic paper with cyanotype chemicals, exposing it to sunlight and rinsing it before agitating the prints in photographic fixer. Again, the interactions between the sensitised surfaces and the specimens placed upon these surfaces created exciting results within both lumen and cyanolumen printing, including unexpected textural and colour shifts.

Cyanotypes, lumens and cyanolumens are all camera-less forms of photography and the one camera based photographic process that I employed was the use of Polaroid photographs. This decision was made after the discovery of the "Polaroid Emulsion Lift" process. Conventionally, a Polaroid is one solid square image in a firm casing. An emulsion lift disrupts this typical association by removing the Polaroid casing and revealing the delicate, emulsion layer in which the image is captured. This is achieved by cutting the border, removing the top casing and then submerging the remains in boiling water, allowing the photographic emulsion to bubble and eventually lift away from its backing. Once submerged in colder water, this emulsion can be manipulated and placed upon new surfaces, such as paper or plastics, as is further discussed in "Seeing value in my Surroundings" below. In this way, the use of water disrupted the conventional rigid appearance of a Polaroid image and resulted in a much

[21] This is the work process that has been productive for me. Other photographers may differ.

more ethereal visual, speaking both to the textures of certain plastics and algae, as well as the delicacy inherent within the balance of natural environments.

In some ways, certain lumens, cyanolumens and cyanotypes within this project can be viewed as visually reminiscent of Atkins' use of the cyanotype medium to record the likeness of various plants and algae. To achieve this, specimens and photographic surfaces are clipped between a sheet of board and glass, ensuring direct contact between the specimens and the sensitised surface (Figure 39).

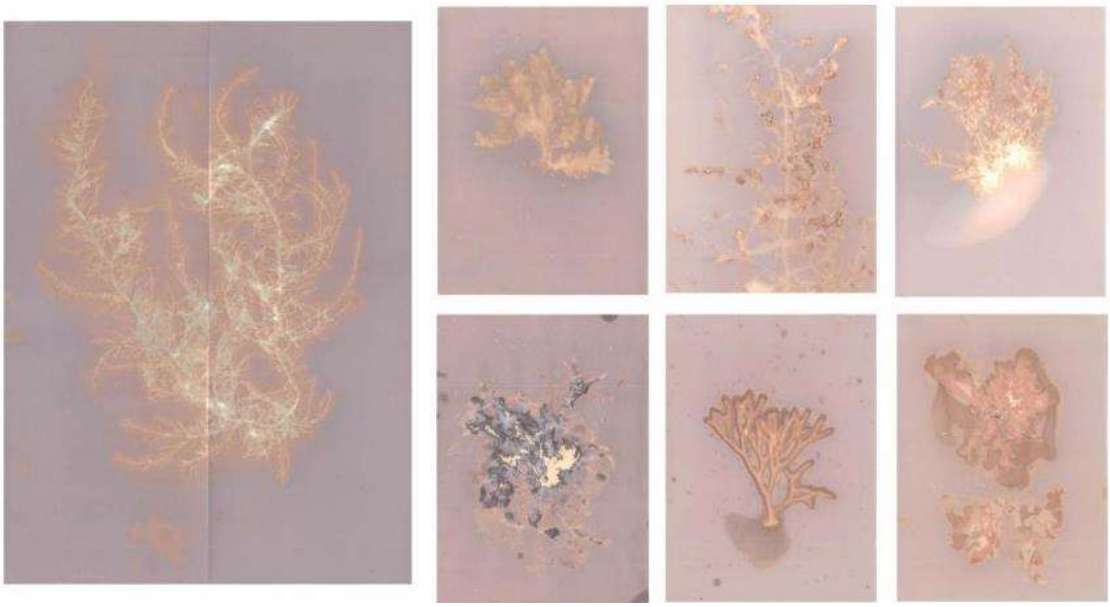

Figure 36. Chloe Obermeyer, *Field Notes: Illuminated Algae* (2020). Lumen prints on silver gelatin paper, sizes vary

Figure 37. Chloe Obermeyer, *Detail of Organic and Synthetic: Illuminated* (2020).
Lumen prints on silver gelatin paper, sizes vary.

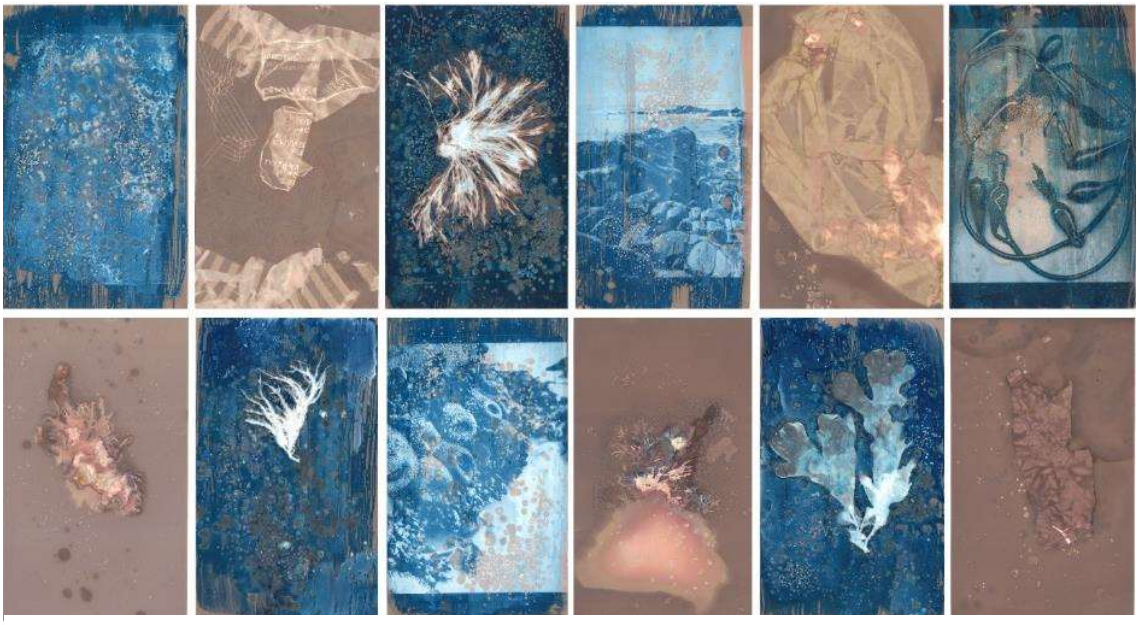

Figure 38. Chloe Obermeyer, *Found and Fixed* (2020). Lumen prints and cyanolumen prints on silver gelatin paper, 12 x 20,3 cm each

This wedging between surfaces allows for a flattening of the specimen and is resonant of the results achieved when using a botanical Herbarium Press which is a device that is used to make plant or algae pressings in order to document and catalogue their likeness. It is usually achieved by placing multiple specimens on archival papers and wedging these between cardboard, blotting paper and newsprint before fastening them between two wooden slats via the use of straps. Atkins' *Photographs of British Algae*: *Cyanotype Impressions* (1843–1853) (Figures 32 and 33) can be viewed as a photographic extension of a Herbarium Press used to preserve and capture the features of plants and algae.

The language of botanical pressings is another example of the intersection between artistic and scientific visual languages, as the aesthetic appeal of nature and the desire to document and study it intersect. Within the practical component of this project, a Herbarium Press and the language thereof is presented in the form of a Catalogue Art Book that accompanies my art-making (Figure 40) and a self-created press was also used in the creation of my "Organic and Synthetic: Pressings" series (Figure 41). This series consists of six algae pressings and plastics collected nearby being pressed alongside them in two of the prints. This piece relates to previously discussed ideas of plastics being "imitators" and their physical similarities with organic matter as well as their oftentimes insidious nature when co-existing alongside such matter.

Figure 39. Chloe Obermeyer, *Example of algae clipped beneath glass during exposure* (2020). (Photograph taken by Chloe Obermeyer. Reproduced by permission of Chloe Obermeyer.)

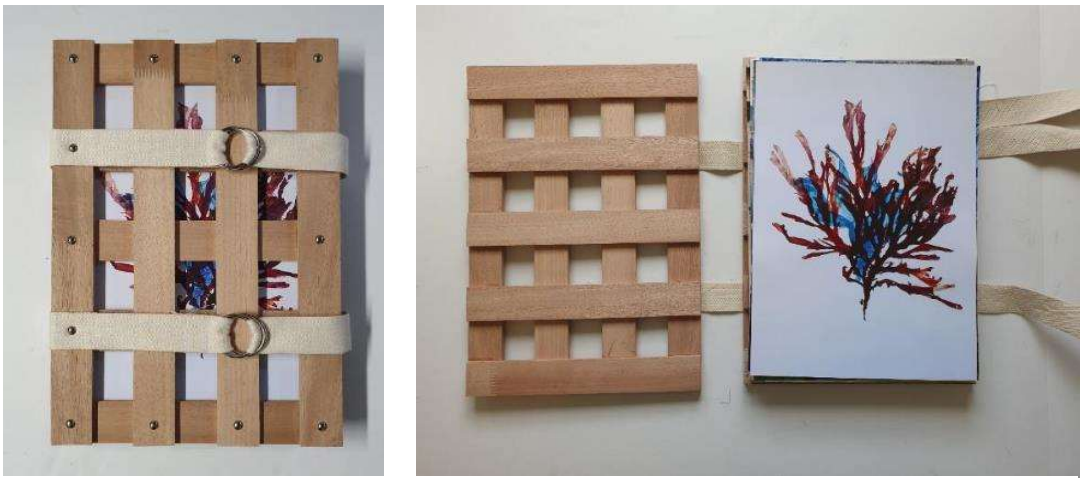

Figure 40. Chloe Obermeyer*, Process images of Herbarium Press Catalogue* (2020).Catalogue art book, dimensions vary. (Photograph taken by Chloe Obermeyer. Reproduced by permission of Chloe Obermeyer.)

Figure 41. Chloe Obermeyer, *Organic and Synthetic: Pressings* (2019- 2020). Algae and plastic pressings on Fabriano paper, 29,5 x 43 cm each.

Water is a substance that is easily taken for granted and my experience navigating the need for water to create art amidst a water crisis further intensified my appreciation for this vital substance. Interactions between the chemistry within my artistic mediums and ocean water have evolved the way that I create works as well as the visual outcomes of my processes. Water has become more than a medium with which I work as ideas of water, fluidity and the ocean and its inhabitants have become main subjects within my works and thus guide the way that I approach the use of my chosen alternative photographic mediums.

5.2. Care in Creativity

In the literature review, I noted ideas of care and connectedness with regards to understandings of our natural surrounding environments. A core motivator behind this project and research stems from ideas of care for the natural world as well as careful contemplation of the impacts that my actions could have on my surrounding environments. I thus began to consider and employ simple and practical adaptations within my art making processes, such as the previously discussed use of ocean water for printing. I now find myself contemplating the practices behind my art making more intensely, often considering means of creating that are perhaps less materials intensive or wasteful. This section considers these ideas and contemplates moments of care and carefulness within the art making for this project.

Care and the action of being careful have been ongoing components while creating the artworks that accompany this document. Patience and planning were needed to effectively complete my chosen artistic processes, such as the preparation of materials for beach trips with the aim of artwork creation or data collection, making the most of my time and materials while in situ on the shore, creating in accordance to tidal rhythms and navigating or adapting photographic exposure needs with weather patterns. Care was also evident with regards to factors surrounding my chosen photographic media as I was careful whilst mixing and measuring photographic chemicals, careful and patient when slowly agitating a print in photographic fixer, careful when handling a delicate algae specimen or wedging it beneath glass during exposure, and careful not to destroy fragile bits of drifting emulsions during the creation of emulsion lifts. However, care was also necessary outside of the practical realities of my art-making and was a recurring factor within the more cognitive aspects of my process, oftentimes guiding my decision making. When working with artistic mediums that required the use of water, as well as various chemicals, it was important to remain vigilant about my consumption and waste. I would argue that working with such processes in a caring way required me to weigh the pros and cons of the use of a specific medium within a particular context, as well as being flexible and adaptable with regards to end products.

As I grappled with the visual and conceptual materiality of various photographic techniques, I also grappled with alternative ways of communicating concepts. This is exemplified by my early experiments with Salt Printing in the beginning of my art making within this project. I have noted how the blue tones of cyanotypes are ideal for conveying ideas of water and the inherent movements within flows of water. When considering ideas of a low tide, however, contrasting ideas of dryness and bareness that can accompany an absence of water must also be communicated. Thus, I began to contemplate mediums which resulted in brown or sepia shades, allowing for a visual contrast with my cyanotype prints as well as a reference to the tones found in exposed rocks or sands. I also wanted to allude to browner shades as noted in various algae. With this in mind, I was initially drawn to the materiality of Salt Printing, due to not only its sepia tones but also its utilisation of an element so greatly associated with the ocean: salt. Salt prints utilise a silver nitrate solution which bonds with the salts on paper which is pre-coated with a salt solution and then exposed to sunlight. However, my experiments with the process suggested that it is more dependent on water quality than the cyanotype process. Additionally, there is debate regarding the longevity of salt printing and it appears to be widely believed that salt prints require toning in order for the chemical structure within the print to remain stable. Conventional toners for this process include platinum and gold, which are extremely expensive in addition to the already pricy silver nitrate. Nevertheless, I was still determined to utilise this process within this project and, after reading reports regarding its effectiveness, used a selenium toner. I achieved satisfactory results and found that, despite the quick formation of stains and chemical reactions within some of the prints, there is indeed a visual and material allure to this process (Figure 42).

However, as this project contemplates my responses to my surrounding environments as well as the use of water within my art-making, I eventually decided that the cons outweighed the pros with regards to Salt Printing for this particular project. I came to this conclusion as, apart from the expense of materials and seeming specificity regarding the quality of rinsing water, the chemical components within this process are more sensitive to impurities and thus much more difficult to work with. Additionally, the use of selenium toner required a level of trial and error and it also needed clean

water in order for stable results to be achieved.[22] Finally, I also came to realise that effective sepias and browns could be achieved through much more malleable processes such as lumen printing. I also began experimenting with organic forms of toning cyanotype prints, such as the use of green tea or coffee, resulting in tonal shifts from blue to brown (Figure 43). This can be noted in "Spontaneous Shore" (Figure 44), in which the blues of sections of un-toned cyanotype and the beiges or umbers of sections of tea-toned cyanotype were meant to create a constructed coastline. While Salt Printing is a fascinating process that could be utilised in my future art making, I felt that the use of lumen printing or the organic toning of cyanotypes was a more considerate and caring approach, and thus more appropriate within the parameters of this project.

Figure 42. Chloe Obermeyer, *Examples of salt print tests* (2019). (Photograph taken by Chloe Obermeyer. Reproduced by permission of Chloe Obermeyer.)

[22] I am by no means suggesting that artists who work with Salt Printing do not care or show care for their natural surroundings. I simply felt it was not the most ideal photographic method within this particular project, especially in light of other workable alternatives.

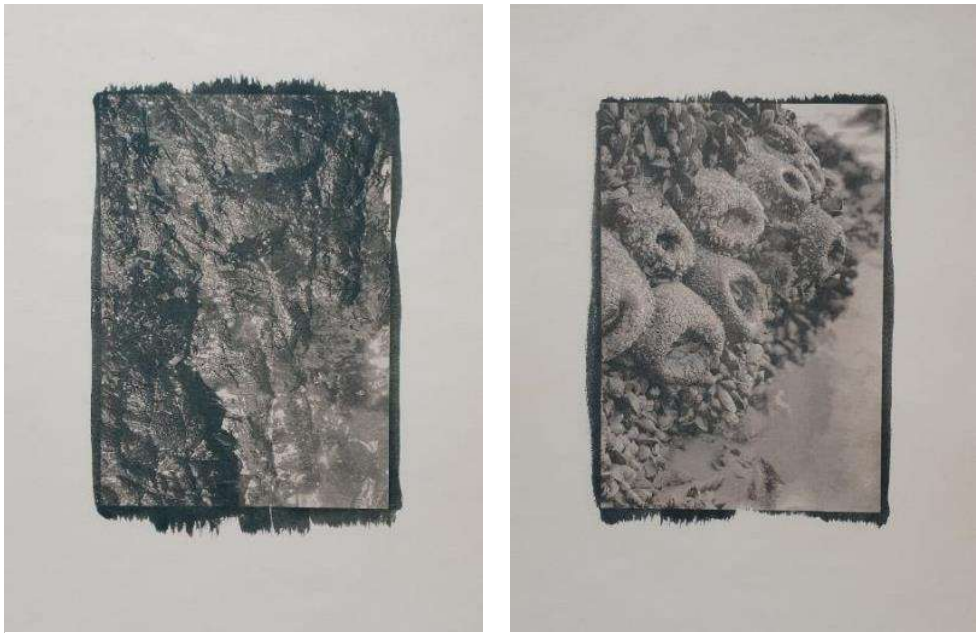

Figure 43. Chloe Obermeyer, *Examples of cyanotypes toned with green tea* (2019).

Figure 44. Chloe Obermeyer, *Spontaneous Shore* (2020). Tea-toned and untoned cyanotype on Fabriano paper, 19,3 x 22,7 cm

The movement towards more careful and sustainable analogue photographic and alternative photographic methods of art creation is gaining momentum. The sharing of knowledge regarding less wasteful and more considerate processes and methods of photo development and the use of photographic media to communicate and capture the natural world and our relationships or interactions with it is becoming increasingly topical. This includes discussions regarding darkroom practices that are more environmentally friendly as well as considerations of how photographic media can be used to communicate ideas regarding the natural world. Many analogue modes of photography provide poetic means of addressing such ideas as they utilise natural phenomena, such as interactions between elements and reactions to light, in order to create works that simultaneously act as a means of capturing elements within nature. In the massive installation piece "Sea Cyanotype", for example, artists Melanie King, Antonia Beard, Millie Egan, Brenda Kearney, Katrin Hanusch and Sofia Arredond collaborated to create a massive cyanotype installation (Figure 45). A large sheet of sensitized fabric was hung at the edge of a cliff with its lower section drifting in the ocean beneath. As noted on artist Melanie King's website: "*... the blue length of fabric connects the depths of the sea to the dome of the sky*" (King, 2019). Figure 45 shows how chemical reactions due to exposure to the elements allow for shifts in the tones on the surface of the cyanotype, with the bottom section becoming more beige or brown. This is a phenomenon that I became familiar with during cyanotype creation, as I noticed the tonal shifts and reactions that can occur during exposure and prior to rinsing.

Such observations resulted in a cognitive shift during the early stages of this project, as I began allowing the parameters of a chosen medium to guide the results as opposed to manipulating media to achieve pre-conceived ideas. Rather than allowing an idea to guide visual outcomes, care within this project meant that the visual results of the interactions between photographic chemistry and the natural elements guided the ideas behind the works.

Figure 45. Melanie King *et al*, *Sea Cyanotype* (2019).

Thus, the brown and sometimes rusty shades that occurred on cyanotypes during exposure became another solution to my desire to achieve more sepia shades. As these tones quickly shift to blues during rinsing, I would, at times, scan a cyanotype before rinsing and create an inkjet print of the resultant image. This can be noted in my "Field Notes: Submerged and Exposed" (Figure 46) series, where the contrast between the blues of rinsed cyanotypes and the rusty shades of the scans of un-rinsed cyanotypes provided a means of communicating the contrast between wet and dry or the presence and absence of water. Furthermore, the use of scanning within the cyanotype process allowed for two images, each with their own appeal, which resulted from the materials needed for only one print. As I became more mindful of my consumption and use of materials within my art making, I learnt the value of letting go of pre-conceived ideas regarding visual outcomes and to embrace the often serendipitous results that accompanied my chosen media.

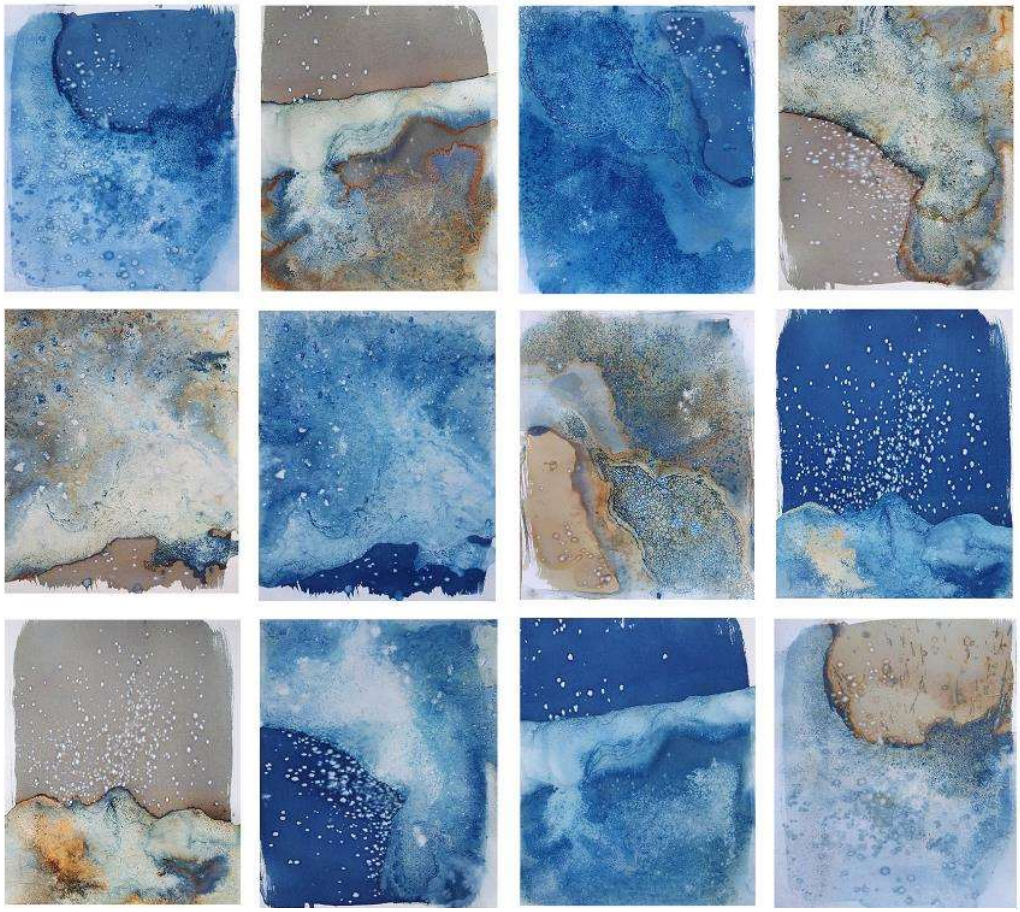

Figure 46 Chloe Obermeyer, *Field Notes: Submerged and Exposed* (2020). Inkjet prints of un-developed cyanotypes and cyanotypes on Fabriano paper, 21 x 25,5 cm each.

Care was also enacted and demonstrated within my interactions with my surrounding environments during the collection of data for the creation of my works, as well as in the observations of my natural surroundings. These observations are further noted in the various short video pieces that accompany the prints within this project. These video works documented moments within my encounters with the coastlines of Cape Town, capturing observations of water and sands, fauna and flora, and marine plastic pollution. In a section of "Plastic Blues", for example, I recorded a piece of bubble wrap that was slowly drifting in the ocean shallows of Melkbosstrand Beach, observing as it travelled along with the organic debris surrounding it (Figure 47). When navigating data collection in natural environments, I aimed to be considerate and careful when choosing what organic debris or items to

collect and how best to utilise these within my art making. With regards to collecting algae, for example, I decided it was best to collect those that were already adrift or had washed ashore as opposed to removing those attached to or growing on a surface.[23] While the collection of imposturous plastics was easier to navigate, I tried not to impede on the natural inhabitants of Cape Town's coasts and rocky shores. This sentiment can also be noted in my "Plastic Blues" video, as I recorded a careful interaction between marine biology student Christie Munroe[24] and the sandy anemones she was studying along the shores of Kalk Bay. In this clip (Figure 48), she tactfully attempts to remove a large piece of plastic that appears amidst an anemone's mouth, only to discover that the vast majority of it is wedged between the surrounding sands and anemones, and she is mindful not to disturb this environment while removing it. Such collected plastics became photographically documented within my art making, as noted in my "Organic and Synthetic: Light and Depth" (Figure 49) and "Organic and Synthetic: Illuminated" (Figure 37) series. Within these series, the incorporation of both naturally occurring organic matter and collected plastics are presented together in accordance with the proximity in which I collected them. In "Organic and Synthetic: Illuminated" (Figure 37), a bit of nearby drifting algae is captured alongside the collected bubble wrap. Meanwhile, ocean water and sands surrounding the plastics depicted in "Organic and Synthetic: Light and Depth" (Figure 49) also became incorporated within the series, as the shapes formed by both the natural and human-made matter allude to one another and blur the visual distinction between organic and synthetic.

Ideas of care and attempts to work carefully within my chosen media have resulted in cognitive shifts regarding my approach to art-making. The unexpected yet exciting visual results that have accompanied my attempts to balance my use of water and materials have given me new found appreciations of the media with which I work. All of this has altered my approach to artwork creation,

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[23] Again, I am not suggesting that individuals who remove or cut growing algae specimens are not caring to their surrounding environments, especially in light of the fact that this is often required within botany and scientific research. This is just a decision I made within this project.

[24] I was recording footage while she was collecting data for her studies.

as I often relied on the reactions between elements within my processes to guide my thoughts and I became open to adapting ideas in accordance to working methods that are more caring to my surrounding environments.

Figure 47. Chloe Obermeyer, *Still from Plastic Blues* [video] (2020).

Figure 48. Chloe Obermeyer, *Still from Plastic Blues* [video] (2020).

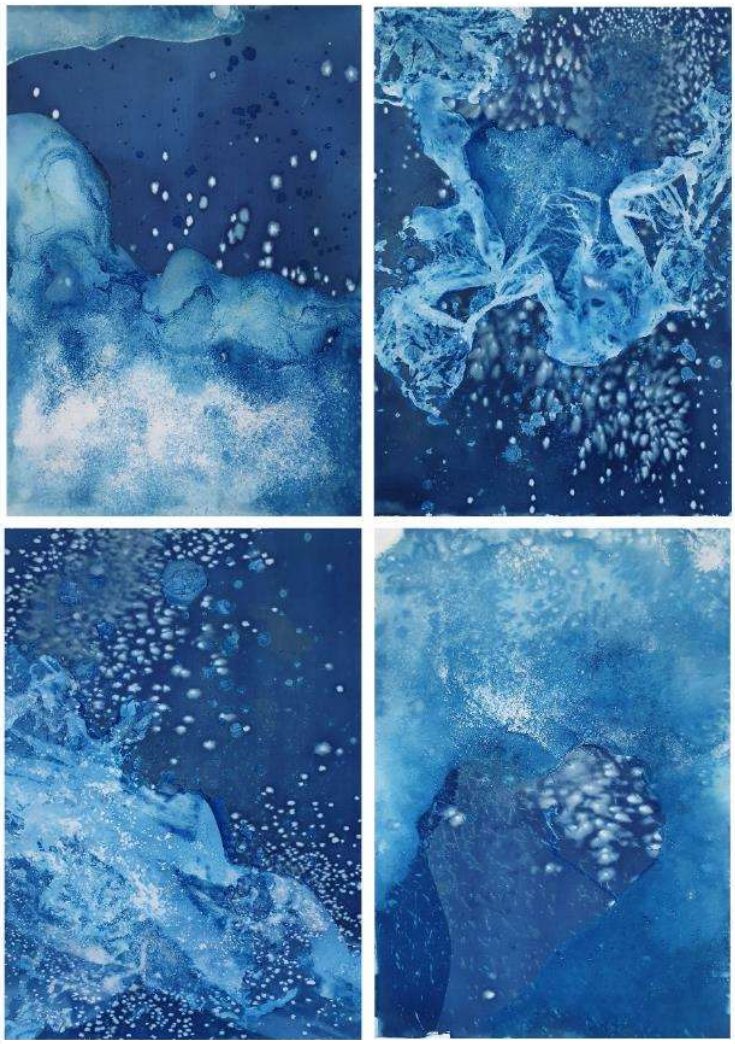

Figure 49. Chloe Obermeyer, *Organic and Synthetic: Light and Depth*, (2020).Cyanotypes on Fabriano paper, 27,7 x 39,4 cm each.

5.3. Seeing Value in My Surroundings

While interacting with fauna and flora along Cape Town's shores as well as spending considerable amounts of time experimenting with photographic printing, a number of noteworthy observations regarding both my art making and my surroundings were made. Additionally, I came to notice how my interactions with and observations of Cape Town's beaches would intersect with information and ideas that I came across during the research for this document. In this section, I consider how the physical and conceptual acts of seeing and observing became crucial within my art making. It considers various visual and conceptual overlaps between the studio and on-site environments in which I worked and notes how these influenced my art making.

In Chapter Three, I consider ideas regarding the origins and understandings of what society has come to call "mermaids", while in Chapter Four, I note an example of marine plastic pollution along the shores of Hong Kong in the form of pellets or "mermaid tears". The contrast between these two ideas of a mermaid reflects the wonder of nature and the horror of humankind's negative impacts on it. In the former case, there are fantastical and mythical creatures resulting from the human imagination. In the latter case is the idea of the pain humankind has caused these creatures and the impacts of marine plastic pollution. During the later stages of this project, I had my first interactions with "mermaid tears", also known as "nurdles", along the coast of Long Beach in Kommetjie after various online outlets and The Two Oceans Aquarium alerted the public that increasing amounts of these nurdles were washing ashore on certain beaches in Cape Town. While I was relieved that it appeared to be nowhere near as severe as the 2012 spill in Hong Kong, what concerned me was how inconspicuous these nurdles were as they blended perfectly into surrounding environments and were scattered to such a degree that it was difficult to collect them. On Long Beach, they appeared to collect alongside other debris, such as feathers or broken shells, along the waterline, as can be noted in my video piece "Amidst the Kelp, Amidst the Sand" (Figure 50). The ones I encountered were between 3 and 5mm in size, some of them clearly already eroded due to exposure to the elements.

I have already described observations that I made while at Cape Town's rocky shores during my research for this project, such as observing bits of Lego or plastic forks being hoisted by anemones. With time, I began to gain a better understanding of the nature of the beaches that I most frequently visited as well as what I might expect to find.[25] For example, I observed that bladder kelps, as seen in my "Bladder Kelp: Illuminated" (Figure 52), frequently wash ashore at Melkbosstrand beach which also tends to contain vast amounts of beach wrack. Sponges also appear to regularly wash ashore in this area. My most abundant interactions with rocky shore fauna has been along the coasts of Muizenberg and Kalk Bay beaches, which have many sea stars, urchins, barnacles, anemones and sometimes small fish, amongst others. I have also come across anemones and urchins during a very low tide at Melkbosstrand beach, but this was quite far into an area that is normally submerged even during a regular low tide. Many such observations were documented through the use of Polaroid emulsion lifts. An accumulation of moments from different beaches can be noted in my piece "A Seascape Imagined" (Figures 52, 53 and 54), in which a number of Polaroid emulsion lifts are used to create an imagined coastal scene. This work especially focuses on creatures that I encountered during my beach visits, including barnacles, mussels, sea stars, sea snails, seagulls and anemones.

The delicacy of emulsion lifts is ideal to document the delicacy of natural environments and the need for such environments to be treated carefully to avoid damage. The material similarity between these emulsions and certain collected plastics is further noted in my work "Field Notes: A delicate collection" (Figure 55) which consists of 12 emulsion lifts depicting observations from various rocky shores, including seascapes, algae, and examples of plastic debris collected in these environments. This includes emulsions of images of a plastic wrapper as well as a plastic bag, and these drifting emulsions and the visual as well as material similarity with the plastic subjects they depict is also noted in the video piece "Amidst the Kelp, Amidst the Sand" (Figure 50). Furthermore, "Field Notes:

[25] The beaches I most frequently visited were Sea Point beach, Melkbosstrand and Kalk Bay beach. I also visited Fishhoek beach, Bloubergstrand, Llandudno and Long Beach in Kommetjie.

A Delicate Collection" (Figure 55) also depicts examples of beached plastic bottles which have been shaped and eroded by the elements into almost deceptively organic looking forms.

Figure 50. Chloe Obermeyer, *Still from Amidst the Kelp, Amidst the Sand* [video] (2020).

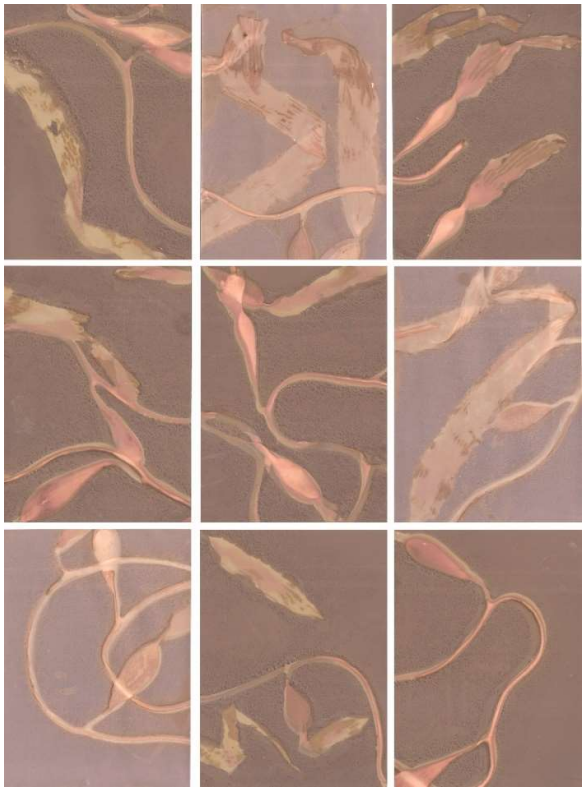

Figure 51. Chloe Obermeyer, *Bladder Kelp: Illuminated* (2019-2020). Lumen prints on silver gelatin paper. 12 x 16,5 cm each.

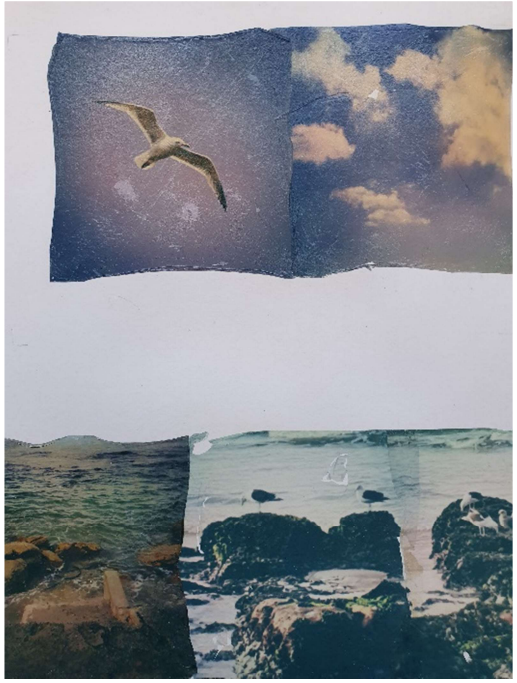

Figure 52. Chloe Obermeyer, *A Seascape Imagined* [Detail] (2020).

Figure 53. Chloe Obermeyer, *A Seascape Imagined* (2020). Polaroid emulsion lifts on mixed media paper, 42,8 x 54,5 cm.

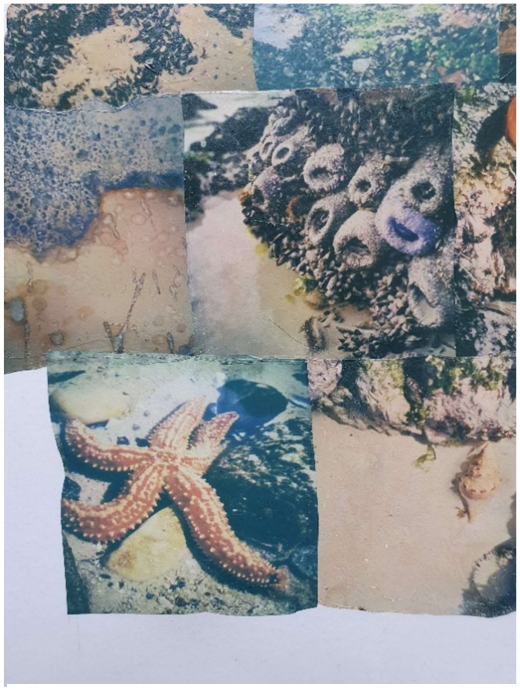

Figure 54. Chloe Obermeyer, *A Seascape Imagined* [Detail] (2020)

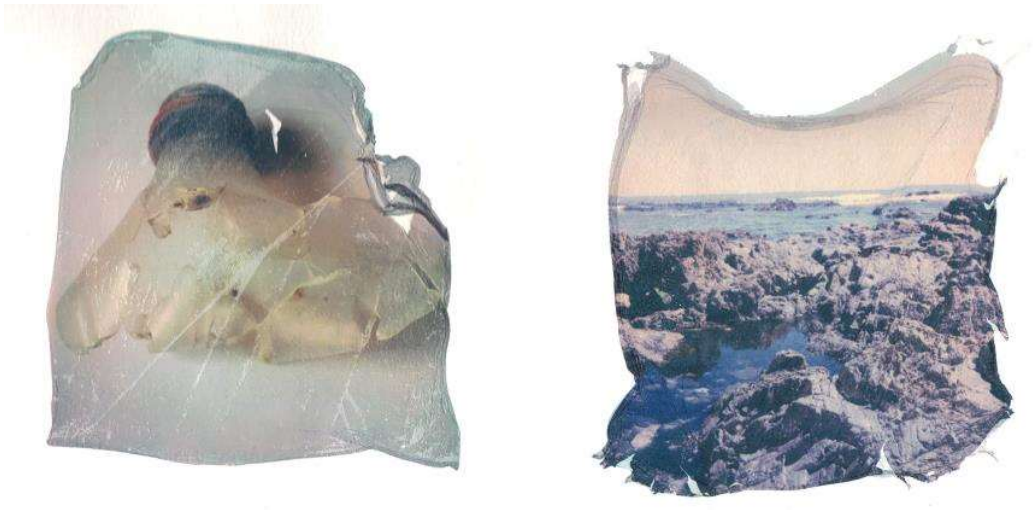

Figure 55. Chloe Obermeyer, *Field Notes: A Delicate Collection* [Detail](2020). Polaroid emulsion lifts on mixed media paper, 14,5 x 18,7 each.

Another occurrence that I noted quite regularly was the intermingling of beach wrack and algae that was washed ashore with white plastic agricultural feed/seed bags – large bags created with interwoven strands of plastic. These plastic strands appeared to unravel, curl and become knotted into the shrivelled kelps and algae on coastal shores, with only the plastics' white colouring hinting to their true nature. On one occasion, I even noticed a shark egg that was stuck between such an interlocking of plastic strands and kelps. My piece "Beach Wrack/Wreck" (Figures 56 and 57) is based upon my observations of this phenomenon. In this work, delicate emulsion lifts are placed upon cuttings of one such bag that I collected, with its woven texture altering the surface of the emulsions. Sections of the partially unravelled and frayed edges of the bag were kept as found and bits of plastic strands were allowed to curl and stray above the emulsion images, reminiscent of the intermingling that can occur when these bags fray and tangle amidst beached kelps. Images of the entanglement of the shark egg amidst these bags, algae and beach wrack were made with the Polaroid emulsion lifts described above.

Figure 56. Chloe Obermeyer, *Beach Wrack/Wreck* [Detail] (2020).

Figure 57. Chloe Obermeyer, *Beach Wrack/Wreck* (2020).
Polaroid emulsion lifts on collected beached agriculture bag, 14,5 x 19 cm each

My encounters with “mermaid tears” led me to consider ideas surrounding the origins of mermaids and to incorporate ideas of “mermaids” within my art-making. In my piece, “Narratives, Storytelling” (Figure 58), I created small mixed media works, incorporating cyanotypes, emulsion lifts and found images from nature books to create a series of three works that play with mythologies of the sea. I used the “mermaid tears” that I collected in conjunction with an image of a manatee, as it was believed that these creatures may have contributed to mermaid myths. The “mermaid” piece (Figure 58) contains photograms of collected nurdles in conjunction with an illustration from an old Readers’ Digest World Atlas describing a manatee as a “siren-like mammal”. “Narratives, Storytelling” (Figure 58) discusses “The Kraken” alongside narratives of the sea in Chapter Three. The Kraken is an overtly imaginative interpretation of an oceanic creature whose reality and physical being is, like many ocean inhabitants, foreign to human land dwellers.

As the Kraken was understood as having tentacles, I began experimenting with representations of an octopus. I decided upon an octopus as they are occasionally spotted on rocky shores and, while I have not encountered one in such an environment, I have interacted with one while cleaning its tank at the Two Oceans Aquarium. Around the time of these experiments, a large *Architeuthus dux* or “giant squid” washed ashore on Britannia Bay, about a two hour drive from Cape Town. Unfortunately, the squid did not survive and has since been taken into the custody of the Iziko Museum. Even though Britannia Bay is not in Cape Town, I decided to create an ode to this creature while referencing ideas of “The Kraken”. The creature in my piece, however, is not a monstrous and indestructible beast but a true, vulnerable and mortal creature that may, at times, be found ashore. The resultant piece, “Kraken 2”, is not a large work depicting a gargantuan creature, but is instead a small, intimate piece constructed from two delicate emulsion lifts and a cyanolumen, depicting a creature resting on the shore beneath a cloudy sky.

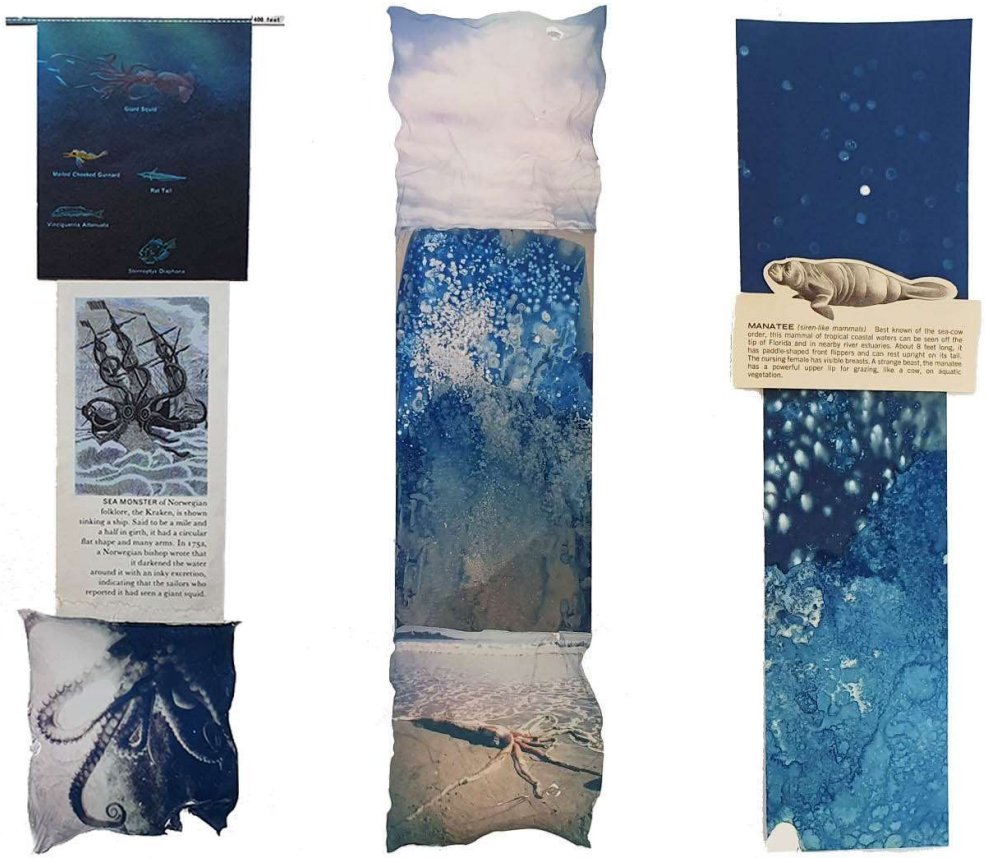

Figure 58. Chloe Obermeyer, *Narratives, Storytelling: Kraken 1, Kraken 2* and *Mermaid* (2020). Cyanotype, cyanolumen, Polaroid emulsion lifts and found images, 23,2 x 50,3 cm each.

As I created works based upon my observations of and interactions with intertidal fauna and flora as well as examples of plastic pollution, I began to notice visual similarities between these environments and occurrences within my art-making processes. I came to realise that the practices and visuals behind the creation of my works are just as valuable within this project as the completed artworks. My various short video pieces provide documented footage not only of rocky shores – such as the ebb and flow of tides, drifting algae or plastic pollution – but also brief glimpses into the practicalities behind my art making. This includes footage of the mixing of chemicals, the rinsing of prints, visual changes in sensitised paper during development, and emulsion lifts slowly bubbling away from their backings while in rinse trays. Furthermore, these video works also demonstrated parallels between my studio

work environments and coastal environments. Movements and swirls of water during the mixing of chemicals are paralleled with movements of water in tidal currents, delicate emulsions in rinse trays filled with collected ocean water parallel delicate bits of drifting kelp or deceptive drifting plastics. When preparing algae for pressing in a Herbarium Press, specimens are often placed in trays of shallow water in order to be manipulated into a desired shape before pressing. The trays used are similar to photographic rinse trays. Thus, I visually parallel a prepared algae specimen in a tray with a drifting emulsion lift in a photographic rinse tray. The movements of water during gentle agitation of these photographic rinse trays are also reminiscent of tidal ebbs and flows while the changing aesthetics and chemical reactions of coated cyanotype paper and their accompanying sepia tonal shifts are visually reminiscent of aerial views of sandy and rocky shores, as can be noted in "Using Seascapes, Creating Seascapes" (Figure 61).

The collection of data along shorelines and photographic experiments within both my studio and local marine environments has allowed me to appreciate the processes behind my art making. I have come to value the material and visual overlaps between the media with which I work and the chosen subjects within my natural surroundings that they depict. The act of observing has resulted in the realisation that the processes that I employ to create works have value outside of the end products of these processes. Furthermore, I have come to embrace how ideas and research may have unexpected ways of becoming incorporated within visual practices and how this, alongside the processes behind my art-making, can strengthen and aid each other.

Figure 59. Chloe Obermeyer, *Still from Seeing, Making* [video] (2020).

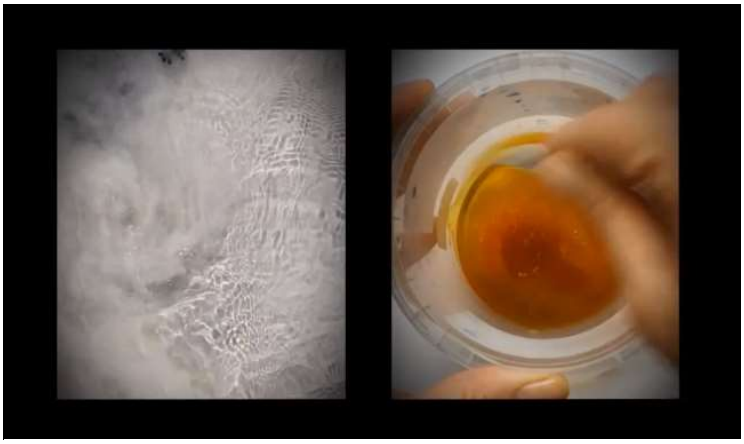

Figure 60. Chloe Obermeyer, *Still from Seeing, Making* [video] (2020).

Figure 61. Chloe Obermeyer*, Still from Using Seascapes, Creating Seascapes* [video] (2020)

CHAPTER SIX: CONCLUSION

This research and the accompanying body of works were instigated by personal interactions with and responses to my surrounding natural environments. It evolved into a project that delves into ideas of care, connectedness and personal reflection in light of the ecological plights that face our natural surroundings. This coincided with critical considerations of the practices behind the alternative photographic processes which I employed and how they effectively and thoughtfully were used to grapple with ideas regarding marine environments and ecological considerations within such environments. In this final chapter, I reflect upon this project as a whole by looking back at my original aims and intentions. I provide a conclusion to this document by re-visiting samples of thoughts and ideas from each chapter that stand out now that they can be contemplated in retrospect. While a conclusion might suggest a final ending, I instead end this project with possible beginnings that may follow this research by considering how the end results of this investigation lead to new considerations within my artistic practice.

The research questions, as stipulated in Chapter One, have guided both the conceptual and visual outcomes of this project. I pose the question of how I might visually communicate ideas of waste, absence and adaptation with reference to the tidal zones. I also consider what literature and theory might assist this. I further contemplate how I might visually communicate ideas of waste, absence and adaption regarding the 2017/2018 Cape Town water crisis. Finally, I ask how the alternative photographic methods that I employ within my art making can be used communicate ideas of care, connectedness and self- reflection regarding my natural surrounding environments.

These questions provided direction to both the research within this document as well as visual navigations regarding the creation of accompanying artworks, as noted on the webpage and catalogue that accompany this dissertation. In Chapter One, I further outline the intentions behind this project, noting how it originated as a response to the needs of my natural surrounding environments with regards to the 2017/2018 water crisis and the need to carefully conserve water. Additionally, I note how my experiences as a volunteer at the Two Oceans Aquarium as well as my interactions with

fauna and flora of Cape Town's intertidal zones sparked the idea for the analogy of a low tide conceptually coinciding with ideas of an absence of water. This, in turn, simultaneously informs and addresses ideas of "absence", both conceptually and visually, as stipulated in the research questions. Furthermore, this conceptual collision is what ultimately instigated this project, as the idea of an artist adapting her practice to water restrictions and the visuals of intertidal environments during a low tide allowed for a plethora of both conceptual and visual explorations. It resulted in my studio and work environments extending into my natural surrounding marine environments. Ideas of "field notes" or a "field study" soon heightened my interest in intersections between scientific and artistic methods of data collection and, ultimately, how the arts and sciences can aid and inform each other. These adaptations within my processes of and approaches to artwork creation recall and answer ideas of "adaptation" that are noted in the research questions. As I continued to create within and in direct response to my surrounding marine environments, observations regarding the abundance of plastic pollution during low tides naturally followed and, with this, "At low tide: an absence of water, and abundance of plastic" was born. The ideas and visuals that accompany marine plastic pollution and ideas concerning careful efforts to conserve invaluable sources of drinking water address the research questions with regards to ideas surrounding "waste". In The Literature Review section in Chapter Two, I note *The Multispecies Salon*'s (2014) interest in survival and thriving in the aftermath of disaster and catastrophe, and how the threat of "Day Zero" was a real life example of such ideas. In retrospect, I note how that particular almost-catastrophe resulted in the unexpected personal aftermath of my artistic practice evolving in a way that I doubt it would were I not to have attempted to adapt my means of sourcing water for printing.

The prominence of the cyanotype process within my artistic practice is also noted in Chapter One, as well as how its lineage is ideal for a project interested in the intersections between scientific and artistic languages. As noted, Anna Atkins' use of cyanotype as a means of photographically documenting marine as well as other botanical specimens made it ideal for this project – as did the blue tonal ranges it achieves. However, the physical use of ocean water as well as salts, sands and other natural debris that accompanied my navigation of intertidal zones and water restrictions allowed

for variations in the process of cyanotype creation that greatly shifted how I approached cyanotype making. My experimentation with cyanotype during this project has shown how this process can communicate ideas of the natural world and intersections of art and science not only through more representational means of image creation, such as recognisable images of algae, but also through the means of capturing chemical interactions with the elements. The process of mixing chemicals, applying them to a surface and allowing the elements of light and oxygen to aid the chemicals' capture of selected natural debris resulted in a physical recording of interactions within nature. This provided a basis to answer how the photographic processes with which I work can communicate ideas of care, connectedness and self-reflection by critically assessing their use of materials and adapting accordingly, as well as visually reflecting surrounding natural environments. Thus, as elaborated in Chapter Five, the processes behind artwork creation became as relevant as the end results. In the Literature Review section, I note how this can be viewed in alignment with Iovino and Oppermann's (2014) views regarding the ever interlocking and changing nature of "storied matter". Such ideas also alignewith Stern's views within his Ecological Aesthetics framework, particularly his observations regarding his careful acknowledgements of the exchanges of light, electricity, movements of water and the mechanics of nature during the creation of his *Compressionism* (Stern, 2018) series.

As this project's approach to ideas regarding ecological care and the promotion of ecological interests evolved, the ideas implicit within multispecies modes of thought became increasingly relevant. One of the key ideas noted in the Literature Review – by Morton, Kirksey, Haraway, Stern and Barad, amongst others – is the value of stepping outside of a purely human-centric point of view. To view the world through a lens whereby the interconnectedness of all living and non-living species and matter are interwoven and share the same planet is a valuable step towards a more connected and self-reflective means of showing care for our natural environments. Ideas surrounding the Anthropocene and its centring of the human being provided a valuable point of departure as well as a crucial reminder of humankind's impacts on natural environments. When looking back at Haraway's proposed alternative of Chthulucene and its ever tentacular comrades, it now seems ideal to consider the 2020 South African documentary, "My Octopus Teacher", which was released in the late stages of

this project. The film tells the story of a human being entering the visually mythical world of kelp forests off the coast of False Bay – a frigid, underwater environment to which humans are not adapted – and serendipitously encountering and forming a strong kinship with an octopus, a species often viewed as an alien. The narrative documented by this film speaks to many ideas that I encountered during my research for this project. It speaks to attempts to understand and navigate the world outside of a human perception, of multispecies kinship, and of showing care for the natural world through considerate and thoughtful observations and movements within it. This also links to Stern's views regarding the value in showing care for environments by taking responsibility through how we move and what we do within our natural surroundings. In Chapter Three, I speak of ideas of wonder and storytelling that ignited a heighted curiosity of the natural world, including accounts of the supposedly monstrous and, like the octopus, tentacled Kraken. The narrative within "My Octopus teacher" in many ways aligns with such storytelling of wonder. It is an example that can be linked back to ideas of how the wondrous and curious qualities within the natural world – the "shimmer" – can inspire imagination and storytelling. It is such storytelling that, as noted by Bruton and Dahlstrom, can assist in both explaining and igniting further curiosity in scientific endeavour and research.

As I have discussed, the Multispecies Salon's interest in the aftermath of disaster and catastrophe is relevant as the latter stages of my research for this project were done during a true collision of natural and cultural worlds: the coronavirus pandemic. Alongside this pandemic is the worsening plastic pandemic that has been plaguing our planet long before Covid 19. In Chapter Four, I briefly consider the invention of modern day plastics and note how Barthes (1972) once described plastic as a "miraculous substance". This is not a position that I thought I would hold when I began this project, but the research for this document has made me realise the complexities of plastic. As noted by both McClellan and Professor Ryan, humankind cannot entirely get away from all plastics. Certain plastics can be used to alleviate the strain on various natural resources, plastics have aided humankind with regards to safety in transport technology and – as the Covid 19 pandemic is further highlighting – plastics can greatly aid medical processes. In Chapter Four, I further note how the use of plastics during the Second World War greatly bolstered public opinion of plastic and it would appear that the

Covid 19 pandemic is having a similar effect. While plastics can be useful, humankind's approach to the consumption of certain plastics is invasive and problematic. As has been established, single use plastics are a particular problem, and the use of single use masks, gloves and other apparatus during this pandemic is resulting in an increase in plastic pollution.

Additionally, the Covid 19 pandemic appears to be distracting focus away from the issue of marine plastic pollution. In June 2020 when my interview with McLellan was conducted, she noted: "*Yes, I totally worry that this pandemic has taken the focus off … our plastic waste and I think that the plastic producers are thrilled about it…*". She further noted how the cheapness of virgin oil and the subsequent cost effectiveness of producing brand new plastic items have resulted in a drop in the economic value of recycling. While it is noted in Chapter Four how recycling is not the solution to the plastic pandemic, this is still a disheartening reality. McClellan further noted: "*If I think of the consistent and concerted, passionate efforts that have gone into this work for me and for many others globally for the past decade, I feel like it's very easily being erased … it's very upsetting".* However, McLellan also maintained that this situation is temporary, and shall pass. I do hope that this is the case. It was indeed shocking to observe examples of surgical masks floating in ocean shallows during the final beach trips for this research – examples of waste that I had certainly not encountered in the earlier stages of this project.

When I originally decided to adopt the role of both artist and researcher, as noted in Chapter One, I thought that my research regarding ecological interests would mostly result in knowledge gained concerning fauna and flora as well as marine forms of plastic pollution. This has proven to be largely accurate and the research for this document alongside knowledge gained from field trips to intertidal zones and the interview with Hayley McLellin have widened my perspectives of this project. An unexpected accompanying factor, however, is how embarking as both artist and researcher also resulted in the additional research and knowledge of alternative photographic media. While this project originated in conjunction with my interest in cyanotype making, my research soon expanded my alternative photographic skills as I contemplated the processes that are most suited to different

outcomes. My interests in the intersections between art and science evolved to not only encompass languages, such as those inherent in the capturing and documentation of natural specimens or phenomena, but also in the science behind the photographic processes themselves. As explained in Chapter Five, I began to delve more deeply into the realisation that art that promotes the wonder of nature and the value of self-reflection, in light of humankind's negative impacts on the environment, also incorporates art that is mindful of the consumption and waste within its creation. I thus began to contemplate more considerate ways of utilising the various media with which I work and also shifted my perceptions regarding end products as I allowed often serendipitous results to guide my ideas.

My research and experimentation with "At low tide: An absence of water, an abundance of plastic" has ignited a desire and curiosity to extend this research into new approaches for future endeavours. This project's interest in promoting ecological awareness and intersections between art and science suggest that future projects may benefit from more direct public engagement and education, especially in light of the impact that volunteering at the Two Oceans Aquarium has had on me. As noted in Chapter Five, alternative and analogue photographic movements towards the promotion of ecological awareness and the practice of less wasteful and more environmentally friendly techniques of photo creation are increasing. This project has firmly placed my interests within such ideas. While I do not intend to elaborate on each new approach that I came across during my research, I note that there are many other innovative ways of creating prints that are mindful of waste and ecological concerns that were not addressed in this project. These, in addition to those practiced within this research, would provide exciting opportunities for future explorations that extend the interests of this project.

As this project was rooted in a practice based approach and the intention of gaining new knowledge by means of the outcomes of my artistic practice, it seems appropriate to conclude this research with such a process of creation. Thus, I conclude this document with experiments that I conducted using the photographic process of Caffenol. This process replaces the chemical developer and fixative conventionally used in black and white darkroom processes with more environmentally friendly alternatives. Coffee granules, vitamin C powder and washing soda are used to create a developer

while an overnight soak in a saturated saline solution is used to stabilise the image in place of photographic fixer. In keeping with the nature of this project, I created photograms of collected kelps. I thus end this this dissertation with images of experiments that speak to the art-making that accompanied this research, created in a new medium and hinting to how the interests of "At low tide: an absence of water, and abundance of plastic" may instigate future personal endeavours.

Figure 62. Chloe Obermeyer, *Experiments with Caffenol developer* (2020).

Figure 63. *Chloe Obermeyer, Experiments with Caffenol developer* (2020).

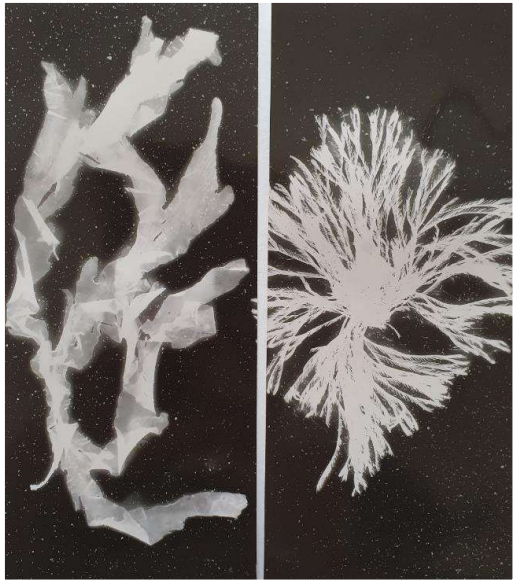

Figure 64. Chloe Obermeyer, *Experiments with Caffenol developer* (2020).

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