ESRA KÖKSAL THE ARTISTIC AFTERLIFE OF ELECTRONIC WASTE Bilkent University 2019

THE ARTISTIC AFTERLIFE OF ELECTRONIC WASTE

A Master's Thesis

by

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Communication and Design

İhsan Doğramacı Bilkent University

Ankara

December 2019

To my family

THE ARTISTIC AFTERLIFE OF ELECTRONIC WASTE

The Graduate School of Economics and Social Sciences

of

İhsan Doğramacı Bilkent University

by

ESRA KÖKSAL

In Partial Fulfillment of the Requirements for the Degree of

MASTER OF ARTS

THE DEPARTMENT OF

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İHSAN DOĞRAMACI BİLKENT UNIVERSITY

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Approval Page

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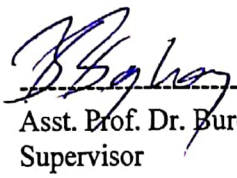

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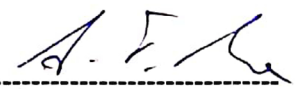

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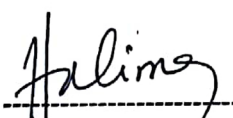

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ABSTRACT

THE ARTISTIC AFTERLIFE OF ELECTRONIC WASTE

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M.A., in Media and Visual Studies

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This thesis aims to take a closer look at artistic projects that use discarded electronic parts as preferred medium. Electronic waste cumulates as the result of a highly technological era. The artworks that take part in this thesis emphasize that obsolete electronics should not be considered waste. From an array of artworks presented, works from artists such as Grégory Chatonsky, Walter Giers and Gabriel Dishaw partake in this thesis. In order to scrutinize these artworks, this study adopts a theoretical perspective that is strongly rooted in Deleuze and Guattari's concepts of 'becoming,' 'rhizome' and 'deterritorialization.' These theories are applied to the fluid state of geological properties—such as aluminium, gold, copper and tantalum—that make up electronic devices. The contents that bring electronics to life are mined predominantly from the inner layers of the earth's strata; therefore, their becomings are initiated long before their functionality in electronics. Contributing to and expanding upon the Deleuzian-Guattarian thought, Braidotti's articulations on 'becoming-nomad' and her argument that nomadic ethics is the path for a sustainable future is also utilized. Besides, engaging in a different perspective toward media, Parikka emphasizes the need to look at media hardware and understand the contents

that makes electronics function. Through art, identifying obsolete electronics with a potential for further use engages with issues of sustainability.

Keywords: Becoming, Braidotti, E-Waste, Parikka, Sustainability

ÖZET

ELEKTRONIK ATIKLARIN SANAT İLE GERİ DÖNÜŞTÜRÜLMESİ

Köksal, Esra
Yüksek Lisans, Medya ve Görsel Çalışmalar
Tez Danışmanı: Yar. Doç. Dr. Burcu Baykan
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Bu tez atılan elektronik parçaları tercih eden sanatsal projelere daha yakından bakmayı amaçlamaktadır. Elektronik atıklar teknolojik çağın sonucu olarak birikmektedir. Bu tezde yer alan sanat eserleri, eski elektroniklerin atık olarak kabul edilmemesi gerektiğini vurgulamaktadır. Elektronik atıkları kullanan, Grégory Chatonsky, Walter Giers ve Gabriel Dishaw gibi sanatçılardan sanatsal eserlere yer verilmiştir bu tezde. Bahsedilen sanat eserlerini incelemek için Deleuze ve Guattari'nin "oluş," "rizom" ve "yersizyurtsuzluk" kavramlarına dayanan teorik bir bakış açısı benimsenmiştir. Kullanılan teoriler tezin konusu kapsamında geliştirilip elektronik aletlerin derlemesinde kullanılan jeolojik özelliklerinin—alüminyum, altın, bakır ve tantal gibi—akışkanlığını ele alır. Elektronik aletleri hayata geçiren içerikler, ağırlıklı olarak dünyanın iç katmanlarından çıkarılıyor; bu nedenle oluşları elektronik cihazlardaki işlevselliğinden uzun zaman önce başlar. Deleuze ve Guattari'nin felsefesine katkıda bulunan ve genişleten Braidotti'nin göçebe etiğinin sürdürülebilir bir gelecek için önemini ve yansıra 'göçebe-oluş' kavramı hakkında düşüncelerinden de faydalanılmıştır. Ayrıca, medyaya farklı bir bakış açısıyla yaklaşan Parikka, medya donanımına bakılması ve elektronik işlevi gerçekleştiren içeriklerini anlama ihtiyacını vurgulamaktadır. Sanat aracılığıyla, eski elektronik

aletlerin aslında daha fazla kullanım potansiyeline sahip olarak kabul edilmesi sürdürülebilirlik meseleleriyle yakından ilgilidir.

Anahtar Sözcükler: Braidotti, Elektronik Atık, Oluş, Parikka, Sürdürülebilirlik

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CHAPTER 1

INTRODUCTION

1.1 Aims and Objectives

This thesis looks at a different aspect of media, namely obsolete media. The rapidly evolving technology industry produces new electronic gadgets faster than the logical life span of electronics. This practice is known as the “disposable technology paradigm”; this means that “the usage lifetime” of electronic devices “is often much shorter than their functional lifetime” (Huang & Truong, 2008, p. 16). Even if the electronics devices are still fully functioning, circumstances such as planned obsolescence and updates in software push the consumer to indulge in new electronic devices. The industry is rather capitalistic and therefore aims at cultivating profit above anything else. Therefore, it is not surprising to argue that the industry does not care for obsolete media, especially since the latest research, according to Breivik et al. (2014), shows that the annual e-waste production is around 35 million tons, globally (as cited in Zeng, 2017, p.2). It is often less profitable to neglect electronic waste rather than to recycle it or extend its life span. The objective of this study is therefore the use of electronic waste in artworks. In a way the artworks symbolize the artistic afterlife of e-waste. The artworks in this study are categorized in three different chapters, to which I will return later. These works of art are scrutinized

through the lens that exists of a combination of theories that create the foundation on which the study relies on, which are discussed in the second chapter.

1.2 The Place of E-Waste in Media Studies

Electronics that are no longer used by consumers have been neglected in media studies. Media studies in general focus more on the social impact that it has on society and the individual. This field focuses on the social platforms that connect humans worldwide, it also sheds light on the use of these electronic devices and how rapidly they have become inseparable from humans. It has become incredibly difficult to imagine human life without the use of electronic devices. It also makes it "difficult to comprehend the scale of environmental destruction" that obsolete media causes while it is "depicted in popular and professional quarters as a vital source of plenitude and pleasure, the very negation of scarcity and dross" (Maxwell & Miller, 2012, p. 4).

One aspect of media studies engages in the analyses of media hardware, which is media archaeology. This sub-field does not include electronic waste but rather focuses on nostalgic obsolete media devices. Therefore, media archeology's focus is more on devices that have become obsolete due to advancement in technology. In opposition, the rapidly cumulating electronic waste that this thesis discusses, is due to business strategies such as planned obsolescence. Obsolescence is a 20th century design concept. There are three types of obsolescence: planned, accepted and obligatory. Planned obsolescence is the deliberate shortening of a products lifetime and this study focuses mostly on this aspect of obsolescence. Accepted obsolescence is the result of "cost and time pressure and marketing strategies" that leads to cheap-quality products (Proske, Winzer, Marwede, Nissen, & Lang, 2016). Lastly, obligatory obsolescence is related to regulations such as safety. Besides these three

types there are various motivations for obsolescence. These include material, economic, functional and psychological obsolescence.

In *A Geology of Media* (2015), new media scholar Jussi Parikka states that there is a missing gap in media studies. He argues that the geophysical aspect of media should not be neglected, as it increasingly becomes a hazardous practice. It is not only problematic when electronic devices become obsolete but is problematic from the start like mining processes. This thesis, therefore, aims to contribute in this research gap by validating the artistic endeavors that use electronic waste. Ultimately, the goal of this study is to spread the reality of electronic waste, and to raise awareness about the many ways in which obsolete media is not waste, but rather a resource that can be repurposed.

1.3 Theoretical Foundation and Artistic Case Studies

The theoretical foundation can be considered a toolbox as it exists of a combination of ideas. The main theory that is utilized is the Deleuzian-Guattarian concept of 'becoming'. Besides this concept, I have used the ideas of Rosi Braidotti and Jussi Parikka. Both writers touch on the concept of becoming and carry the concept to discussions concerning sustainability and media. It is therefore, that this theoretical toolbox can be considered as a pragmatic choice when it comes down to the analysis of artworks.

The artworks that have received a place in this thesis are chosen because they engage in the practice of repurposing electronic waste. However, this is not the sole reason since the artworks themselves make a claim that aligns with the theories used. It is valuable to note that I have not focused on picking artworks that share the same modality, therefore I have included art installations as well as photography and DIY

practices such as circuit-bending. What all artworks have in common is that they are all criticizing the categorization of electronics as waste, and therefore utilize electronics to shed light on this issue of e-waste—all in their unique manner.

1.4 Structure

This thesis consists of six chapters, the first being the introduction. The second chapter is the theoretical chapter in which I go in-depth into the theories and concepts that make up the toolbox that is then utilized in the analytical chapters. The third chapter consist of artworks that have a political stance against the cumulation of electronic waste. Each artwork provided in chapter three can be read from a political standpoint. The artworks of Revital Cohen and Tuur van Balen, Grégory Chatonsky, Chris Jordan and Katherine Behar are featured in chapter three. The fourth chapter consists of artworks that criticize the fluidity of value in electronic waste. The artworks—by artists Yuma Fujimaki, Hiroto Ikeuchi, Gabriel Dishaw and Mounou Desire Koffi—provided in chapter four use electronic waste to create commercial products. The fifth chapter of this thesis consist of artworks—by artists Reed Ghazala, Benjamin Gaulon and Walter Giers—that engage in DIY practices such as circuit-bending and tinkering. These practices break down the metaphorical wall between the manufacturer and the consumer, since the innerworkings of electronic devices are not a concern for the consumer. Each analytical chapter uses specific aspects of the theoretical chapter, but ultimately taken as a whole they analyze the afterlife of electronic waste, as they consider the elements of technologies as entities in the process of becoming. Lastly, the final and sixth chapter of this study is the conclusion.

CHAPTER 2

A THEORETICAL OUTLOOK: BECOMING-OTHER / METAL / EARTH

2.1 Introduction

This chapter delves into the theories and concepts that create the theoretical toolbox for this thesis. The conceptual resources that compose this toolbox exists each in their own integrity; combined together they create the theoretical foundation to support the arguments this thesis aims to defend. Essentially, this toolbox is a pragmatic combination of the required theories, concepts and arguments needed to scrutinize artistic projects that use electronic waste as preferred material.

The main theory that creates a lingering theme in this toolbox is ‘becoming’ which is coined by philosophers Gilles Deleuze and Félix Guattari. Their theory is further expanded, discussed and applied by philosopher Rosi Braidotti. Meanwhile, new media scholar Jussi Parikka makes use of the above-mentioned theories and expands media studies in a different direction—a direction that focuses on the geological aspect of media. Therefore, it can be stated that this toolbox consists of mixed theories that are combined to create the desired perspective for this thesis. The theories in this toolbox in one way or another argue for the sustainability of entities in favor of external forces; this argument can also be made for the repurposed electronics in the works of art. As much as this theoretic toolbox is pragmatic, it is

likewise organically linked; the concepts and arguments by these scholars support each other naturally.

The prominent concept becoming is applied because it is regarded as life itself. Colebrook explains this aspect of becoming by stating that "there 'is' nothing other than the flow of becoming" (2002, p. 125). Deleuze and Guattari assume that 'life' in this context does not mean all things living, instead it is emphasized that inorganic matter, such as rocks, minerals and man-made objects are all included (1980/1987, p. 10). Hence, this theory is an all-encompassing concept: it does not discriminate.

Besides Deleuze and Guattari, known as a feminist and Deleuzian scholar, Braidotti expands the Deleuzian-Guattarian thought by including her discussion on aspects such as 'sustainability' and 'nomadic ethics' among others. Braidotti's works, especially her book *Transpositions: On Nomadic Ethics* (2006) provides a fundamental source for the beforementioned toolbox. In this book she explores nomadic becomings from a *zoe*-centered egalitarian, sustainable and environmental point of view (2006a, pp. 35-42). Furthermore, new media scholar Parikka's work is influenced by the Deleuzian-Guattarian thought as well as Braidotti's articulations on the affirmative forces of *zoe*. In *A Geology of Media* Parikka proposes to scrutinize the layers of the earth in their connection to materials that make media hardware possible. He introduces a new perspective to media studies; instead of looking at media platforms and their implications, he shifts the focus to media hardware and their makeup.

The shared thought in the works of the mentioned four authors is their gravitation to earth: their works share an earthly tone. Another common ground is the becoming of all entities; the continuity of living and non-living things. Their discussions have a common theme for sustainability of the earth: in all its forms, organic and inorganic.

The idea is that earth is sustaining itself by always existing in one way or another: always becoming-earth. This thought is also a shared theme in the artistic works mentioned in the upcoming three chapters. But before the analyses of the art projects, this chapter dives into further detail of the beforementioned works. The following section is categorized similar to a building block, meaning that the bulk of the theory—Deleuze and Guattari—are discussed first. Following, Braidotti and her thoughts on nomadic ethics and sustainability is discussed. The section ends with the articulations made in *A Geology of Media*, where Parikka suggests an alternative media materialism which involves the geophysical nature of the medium. Parikka argues that his argument on the geological aspect of media sheds light on a gap in media studies. It is this gap in which the analysis of the artworks that partake in this study will find itself a place.

2.2 The Environmental Tone in Deleuze and Guattari's Becoming

Gilles Deleuze is a French philosopher who is predominantly known for his works on philosophy, film and literature. His co-author, Félix Guattari, who is a French psychotherapist and philosopher, is well known for founding ecosophy beside his work with Deleuze. Their prominent co-authored work *Capitalism and Schizophrenia* exists of two volumes: *Anti-Oedipus* (1972) and *A Thousand Plateaus* (1980), expands to and includes many fields such as philosophy, language, art, literature, film and nature. Influencing many fields with their two-volume work, they create a fertile ground for extensive disciplines and overlapping of discussions. Their concepts are closely crafted with all things related to the earth; *A Thousand Plateaus* mentions orchids, bees, wolves, gold, minerals, women, children, the 'other' among many more. The environmental tone is a persistent theme throughout this collaborative work. In the context of this study, the Deleuzian-Guattarian thought is

applied to the becoming-other/metal/earth of the elements used in electronic devices. Besides, Guattari has multiple books concerning the environment of which the most prominent is *The Three Ecologies* (1989) in which he proposes the term 'ecosophy.' This term stands for the sustainable solution that is a conjunction of the three ecologies: the environment, social relations, and human subjectivity.

2.2.1 The Ontology of Becoming

First of all, becoming is described by Deleuze and Guattari as a "a verb with a consistency all its own; it does not reduce to, or lead back to, 'appearing,' 'being,' 'equaling,' or 'producing'" (1980/1987, p. 239), the emphasis here is that a fixed or stagnant state does not have a place in their theory. Rather the opposite is what defines their work: the dynamic fluidity of life. Consequently, becoming is a state of in-betweenness, it does not have a start nor an end: it is a continuous, mobile and never-ending process of change. Deleuzian scholar Claire Colebrook states that "all 'beings' are just relatively stable moments in a flow of becoming-life" (2002, p. 125). Indicating that becomings happen through interactions in everyday life, they initiate a shift in perception. It is argued by Deleuze and Guattari that becoming starts with a minor group and thus either as becoming-woman or becoming-animal (1980/1987, p. 277). Braidotti (2006) argues that even women have to start with becoming-woman in order to disengage themselves "from the Phallic signifier" (p. 133).

The reason why becoming starts with a becoming-woman or becoming-animal is due to the western standard which happens to be: man. In western ideology the highest level is reserved for the white men, therefore everything else is positioned in relation to this norm. As stated, becoming happens on the level of 'minoritarians,' this does not describe groups according to their quantities but rather "in terms of the mode of

their formation" (Colebrook, 2002, p. xxv). The mode in this context is the dominant white male, all other beings are repositioned in this hierarchy according to their relation to this ruling group. This aspect of becoming proves to be important in its application to obsolete media because physical media derives from the earth, and the earth is treated as the other.

All becomings start at the level of the minority, and as the earth itself is treated as a lesser entity in comparison to the norm that is man, the earth itself is in a continuous process of becoming-earth. The earth undergoes constant changes inflicted from multiple intensities. Such intensities are both natural as well as human inflicted impacts. These constant changes are what becoming-earth entails. In a similar manner, the metals that create the physical formation of media are derivative of the earth, and these chemical elements are also treated as the other. Metals such as gold, aluminium, copper and titanium each have their own unique chemical formation and natural history of formation. Since industrialization and man's need for such metals, these chemical elements are introduced to becoming-metal. Although metals are shaped and formed according to desire and need through extreme external forces such as heat, cold, and pressure they continue to be metals. The results of becoming are not necessarily material or visual because "becoming produces nothing other than itself" (Deleuze & Guattari, 1980/1987, p. 238). Therefore, the extreme processes metals undergo do not change their chemical formation, rather through these processes each chemical element engages in the process of becoming-metal.

Correspondingly, becoming-animal does not entail imitating an animal any more than becoming-woman does a woman. As Deleuze and Guattari heavily emphasize becoming-animal does not mean that the person is "playing animal" or "imitating an animal", nor does it mean that one "becomes an animal" (1980/1987, p. 238).

However, this does not mean that becoming-animal is not real; it is rather the experience of *difference* in perception that makes becoming-animal real. It is in this instance valid for all becomings that transformation is most often invisible to the eye. Rather, individual nuances in perception can be expected. Therefore, becoming-animal should be understood not as a physical transformation but rather a "humble" shift in one's perception and "a being-there with and for other entities, forces, beings" (Braidotti, 2001, p. 179).

2.2.2 Rhizomes and Territories

In order to fully explain the concept of becoming, Deleuze and Guattari introduce new terminologies. It is interesting to note that most of these terms are derivative from nature, such as the instinctual behavior of animals to mark themselves a territory. Deleuze and Guattari take the act of territorialization and apply it to becoming. They assume that the self has a territory to start with—"territories are more than just spaces: they have a stake, a claim, they express (my house, their ranch, his bench, her friends)" (Macgregor Wise, 2005, p. 78)—and that becomings happen through changes in territories. These changes occur through external forces and intensities that allow for territories to change in nature. This continuous change in territories is best described as follows: "becomings brings about the deterritorialization of one term and the reterritorialization of the other; the two becomings interlink and form relays in a circulation of intensities" (Deleuze & Guattari, 1980/1987, p. 10). This indicates that encounters, linkages, connections allow for becomings to set forth, challenging the perspective of the self. Yet the emphasis is that this is a continuous and intertwined process rather a isolated and linear one.

Deleuze and Guattari state that “becoming is a rhizome,” this illustrates becomings in a way that is multiple and ever-expanding (1980/1987, p. 238). Rhizomes in nature have multiple stems and therefore have “multiple entryways” (Deleuze & Guattari, 1980/1987, p. 12). In this regard, becomings are in essence intermingled and complex. Like the rhizome, all becomings have neither a beginning nor an end. They are always in-between, or ‘intermezzo’ as Deleuze and Guattari define (p. 25). This rhizome is not fixed, as each becoming adds and expands it in a way. According to Braidotti, becoming has the effect of the “acceleration of awareness, self-knowledge and the senses” (2001, p. 179). Hence, becomings do not have an end result, neither do becomings gain anything from the process but itself; it does not aim to physically change the self or subject.

The rhizome apprehends the multiplicity of becoming. Deleuze and Guattari state that becomings are multiple. Implying that a subject can engage in multiple becomings at the same time, this can be understood by Colebrook’s description of the rhizome as “random, proliferating and decentered connections” (2002, p. xxvii). In one instance Deleuze and Guattari state that becoming, and multiplicity are essentially the same thing. The definition of multiplicity is defined by “the number of dimensions it has; it is not divisible, it cannot lose or gain a dimension *without changing its nature*” (Deleuze & Guattari, 1980/1987, p. 249). The rhizomic formation of becoming can be observed—besides other artworks—in the artworks *H/AlCuTaAu* (2014) and *B/NdAlTaAu* (2015), in which a number of chemical elements are randomly combined into an ore. Both works by artists Revital Cohen and Tuur van Balen are analyzed in chapter three.

2.2.3 Becoming-Other and its Significance in Environmental Studies

Considering the examples up until this point, it might look as if becoming happens only on the level of humans, in actuality the Deleuzian-Guattarian becomings include all sorts of categorical orders: human or non-human, animate or inanimate, organic or inorganic. This means that an animal or an inanimate object can also undergo the process of becoming. This aspect is crucial, as the artistic case studies presented in this thesis are scrutinized through this theoretical lens. In *A Thousand Plateaus* Deleuze and Guattari begin to explain their concept of becoming through the example of the orchid and wasp. Through the dance of the wasp and the orchid, the wasp engages in becoming-orchid and the orchid engages in becoming-wasp (Deleuze & Guattari, 1980/1987, p. 10). Essentially, these two creatures expand their territories by deterritorializing each other. Instead of the interactions of the subject, the focus is on the territorial shifts that the subject engages in. This example emphasizes that becomings do not discriminate, they are all-inclusive.

Deleuze and Guattari state that becomings happen when a form of link occurs, albeit not all linkages elicit becomings (1980/1987, p. 237). As discussed, the self expands, grows, and shifts in perception by becoming-other. In the context of this study, when we shift the emphasis to metals and minerals, and apply becoming to these elements we can observe a process of becoming with temporal figurations at the hand of multiple intensities. Gold for example is used in almost all electronic devices. How can gold find itself in the theory of becoming? Gold is considered to be natural resource, yet gold as we know it has not always been part of the earth. This is due to the formation of gold as the result of external environmental intensities and durations that happened over an extended period of time. Therefore, it remained in a temporal process of becoming-gold: a dynamic state with intensities and multiplicities. As

Deleuze and Guattari argue “the rhizome is altogether different, *a map and not a tracing*” (1980/1987, p. 12). The rhizome of gold until it was considered as a valuable metal by humans can be considered a map. Although, it is crucial to understand that the rhizomatic formation of gold does not end when it gains value by humans. Its multiple becomings continue as each different linking to animate or inanimate entities can elicit a new becoming. This continuity in some instances is through being part of electronic devices and consequently e-waste. But in some cases, it is repurposed to exist as a part of an art installation. It is important to note that gold does not ‘become’ something, gold is still gold, it is in essence still a chemical metal labored from the earth. Yet through its multiple becomings it is ascribed value from currency to jewelry to hardware and even waste. This fluidity in value can be observed in the works of Yuma Fujimaki, featured in chapter four. Fujimaki creates commercial jewelry from parts he recycles from electronic waste.

2.2.4 Art and Becoming-other

Deleuze and Guattari argue that artistic practices are essential to all animals, as they state that creating territories is an artistic endeavor and can be seen in the territory songs of birds, in the carefully crafted webs of spiders and so on (1980/1987, pp. 310-350). Therefore, the emphasis is that art is not exclusive to humans. Deleuzian philosopher Elizabeth Grosz (2008) states that “what is most artistic in us is that which is the most bestial” (p. 63). Deleuze and Guattari “affirm the plane of composition as the collective condition of art making”; this means that it “contains all works of art” such as “the transformations, ‘styles,’ norms, ideals, techniques, and upheavals” (as cited in Grosz, 2008, p.70). Grosz continues by stating that artworks “arrests, freezes forever” a state of being “from the transitory and ever different chaos of temporal change” (2008, p. 74). Although, art freezes the instance of

individual temporalities, it generates “future sensations, new becomings” (Grosz, 2008, p. 75). According to Deleuze and Guattari (1980/1987, p. 346) this aspect of art is the most crucial:

> In this respect, the relation of artists to the people has changed significantly: the artist has ceased to be the One-Alone withdrawn into him- or herself, but has also ceased to address the people, to invoke the people as a constituted force. Never has the artist been more in need of a people, while stating most firmly that the people is lacking—the people is what is most lacking.

Here it can be understood that Deleuze and Guattari are concerned with the shift in the practices of artists and their audiences. They urge the artists to have communication with the audience and vice versa. In the case of artworks presented in this study, the use of e-waste as preferred material poses a critique toward the mass consumption of electronics and in relation the mass production of waste. Therefore, it can be argued that the artworks presented in this study do not only aim to provoke the audience and stir up sensations but aim a bit further to arouse a sense of responsibility for the cumulation of e-waste. Thus, the ultimate aim can be said that the works of art presented in this study call for an activist action that proclaims a sense of responsibility for human consumption.

Deleuze and Guattari describe art as sensations that are experienced and remembered. Art is “a creative line of flight, a smooth space of displacement” and therefore captures these sensations (Deleuze & Guattari, 1980/1987, p. 422). Grosz (2008) states that “art is not a pure creation from nothing, but the act of extracting from the materiality of forces, sensations, or powers of affecting life” (p. 75). It is in this respect that art has to derive from something—“ready-mades”—which Deleuze and Guattari call *art brut* or “the base or ground of art” (Deleuze & Guattari, 1980/1987, p. 316).

In respect to Deleuze and Guattari's perspective on art, their philosophy on becoming creates a valid foundation for artistic projects that involve e-waste. The artworks related to e-waste by artist duo Revital Cohen and Tuur van Balen are excellent examples in which "the becomings of the earth couple with the becomings of life" (Grosz, 2008, p. 79). Their work *Retour* (2015) which criticizes the current practices surrounding electronic waste on the level of physical labor in mines as well as the fluid value of metals such as gold, is further analyzed in the succeeding chapter. Similarly, artist Grégory Chatonsky's exhibition titled *Telofossils* (2013) anticipates future archeology. Grosz states that art has the "task of representing the future, of preceding and summoning up sensations to come, a people to come, worlds or universes to come" (2008, p. 78). Chatonsky's works, in which the future is devoid of humans and its archeology exists dominantly of electronic devices, are analyzed in chapter three. Hertz and Parikka (2012) argue that media does not die; it does not decay or rot. Therefore, most of electronic waste will stay for eternity—unless it is reused or upcycled—in the same condition it was abandoned. Indeed, this causes piles of electronic waste that fills up landfills and bleeds toxicity to which I shall return later.

In conclusion, the Deleuzian-Guattarian thought is deeply embedded in nature to such degree that becoming is described as innate part of life itself. Correlatively, this is the reason why becoming constitutes the main theory of this thesis. Furthermore, without leaving Deleuze and Guattari entirely behind, the next section focuses on Braidotti's articulations on becoming-nomad.

2.3 The Concept of Sustainability in Braidotti's Nomadic Ethics

Having laid the foundation of this theoretical assemblage, this section focuses on Deleuzian-Guattarian scholar Braidotti and her approach to sustainability. Her take

on becoming is similar to the original proposed theory, yet her discussion expands the concept and therefore differs slightly. Instead of focusing solely on Deleuze and Guattari, she is influenced by philosopher Baruch Spinoza as well. Although, Deleuze and Guattari are influenced by the same philosopher, Braidotti uses Spinoza's concept of monism as the foundation of her nomadic theory. Overall, Braidotti discusses multiple concerns such as patriarchy, capitalism, and environmental problems. This section focuses on her arguments concerning environmental sustainability.

In *Transpositions: On Nomadic Ethics*, Braidotti discusses nomadic-becoming and its importance opposed to the current wave of anthropocentrism. She argues that becoming-nomad provides excellent promise for a sustainable future; "philosophical nomadism contests the arrogance of anthropocentrism and strikes an alliance with the productive force of *zoe*—or life in its inhuman aspects" (Braidotti, 2006a, p. 97). The problem is the environmental disequilibrium, which is the reason for climate change, environmental decay, extinction of plants and animals etc. In this instance it can be said that Braidotti's approach is not only confined to environmental aspects of the problem, because she argues that the problem as a whole—yet in a singular manner—needs to be taken into consideration. Looking at the problem in general does not enforce the holistic approach of uniting all beings as one. Instead, climate change and related environmental concerns are not caused, and therefore cannot be solved through individual actions. Even if this approach takes place, it will not be sustainable.

Braidotti argues against an anti-humanist approach. She argues that it is a change in collective human perspective which can create a sustainable solution to the disequilibrium of nature. Expanding a humanist idea to provide a solution to a

manmade problem is deemed unfit. Therefore, “stepping beyond anthropocentrism” is Braidotti’s preferred approach and by doing so one can look “at the world from a dramatically different perspective, which does not assume a passive nature and a consciousness that must be by definition human” (2006a, p. 104). Braidotti does not try to solve the problem that is generated by man’s will to dominate nature either, instead her approach is to “passionately pursue the quest for alternatives” (2006a, p. 4). She argues that a *zoe*-centered egalitarian perspective is the right fit, by stating that “bio-centred egalitarianism is a philosophy of affirmative becoming, which activates a nomadic subject into sustainable processes of transformation” (Braidotti, 2006a, p. 110). In order to exempt philosophical nomadism from an “anarcho-revolutionary philosophy” Braidotti states that “nomadic politics is not about a master strategy, but rather about multiple micro-political modes of daily activism or interventions on the world” (2006a, p. 205).

2.3.1 The Triumph of Zoe

Braidotti categorizes life on earth as either *zoe* or *bios*. Animal life and nonhuman entities are considered to be *zoe* whereas *bios* is described as life as “the prerogative of humans” (Braidotti, 2016, p. 381). *Zoe* then represents all that is non-human; this includes stones, plastic, water, insects, trees, flowers etc. Braidotti argues that an “affinity for *zoe*” is the first step toward a sustainable future, because it shifts the foundation of the centered subject: the human (2006a, p. 97). Instead of the dualism between human/non-human, it paves the way for the ‘other’ which in this case is the animal and “earth life in all its potency” to gain importance in conversation and action (Braidotti, 2006a, p. 97). This “introduces the issue of becoming into a planetary or worldwide dimension, the earth being not one element among others,

but rather that which brings them all together" (Braidotti, 2006a, p. 97). Therefore, a *zoe*-centered approach is decentering the human, but not excluding it.

The common ground for *zoe* and *bios* in this instance is the earth itself. In opposition of a holistic approach such as the Gaia theory—that considers everything in relation to each other—Braidotti takes an oppositional stance that favors a monistic approach. Her view on monism derives from Spinoza and believes in a unity that is connected to the shared habitat of all things: planet earth. The Gaia hypothesis explored by Arne Naess (1977) also utilizes Spinoza's articulations, but Braidotti states that her "nomadic perspective, moreover, a Spinozist-Deleuzian ethics actualizes a non-unitary and post-individualistic vision of the subject" (Braidotti, 2006a, p. 117). Thus, she ultimately creates a blend with Spinoza's monism along with Deleuze and Guattari's becoming: which according to Braidotti concludes that becoming-nomad is the path for sustainability.

In order to engage in becoming-nomad, one has to expand their perspective to that of the other. Braidotti puts z*oe* on the same spectrum as women because both share the status of the other. Therefore, the triumph of *zoe* indicates the triumph of the other. Becoming-other is the initial step and paves the way for this triumph. Braidotti (2002) ascribes *zoe* as the "affirmative power of life, as a vector of transformation, a conveyor or a carrier that enacts in-depth transformations" (109). In the current atmosphere of posthumanism *zoe* has the power to move beyond anthropocentrism and include non-human others in the debate for a sustainable future. It is Braidotti's consensus that nomadic becoming is the path for a sustainable future. The anthropocentric view considers the problem from a man-centered view. This means that when faced with a problem such as the disequilibrium of nature, the anthropocentric view approaches the problem and its solution from a man dominated

view. Instead, nomadic becoming engages in new thoughts and philosophies that accept the other as entities that are part of the group rather than something to be dominated. Braidotti states that a nomadic style of thinking "is open to encounters with others—other systems of thought or thinking environment. The urgency of constituting these transversal alliances needs to be stressed as one of the pre-conditions for the quest for sustainable standards" (Braidotti, 2006a, p. 139). Thus, rather than imposing a human-centered thought on non-humans, "bio-centered egalitarianism is an ethics of sustainable becomings, of affirmative qualitative shifts that decentre and displace the human" (Braidotti, 2006a, p. 262).

2.3.2 The First Step to Nomadic Becomings: The Ethics of Care

The initial step to becoming-nomad goes through becoming-animal. As Deleuze and Guattari argue, becomings begin with either becoming-woman or becoming-animal. In the case of an environmental subject and to shy away from an anthropocentric view, becoming-nomad starts by becoming-animal. This necessitates the shift from an anthropocentric view and calls for the "recognition of trans-species solidarity" (Braidotti, 2006: 99). As discussed, becomings define the transformation of one's subjectivity, rather than a physical transformation this is because all becomings are molecular; "the animal, flower, or stone one becomes are molecular collectivities, haecceities, not molar subjects, objects, or form that we know from the outside and recognize from experience, through science, or by habit" (Deleuze & Guattari, 1980/1987, p. 275). Braidotti argues that a transversal connection needs to be established among those who are categorized as others. She proposes a sphere of "transversal subjectivities" which exists as "an expanded self" that includes the plane of "nonanthropomorphic elements" (Braidotti, 2017, p. 87). This expansion in subjectivities exemplify what becoming-nomad entails.

What is then needed to commence becoming-nomad? How can these transversal connections be established? In order to change one's habits and perspective, he or she needs to care about the subject. In the technologically mediated world of today, the practice of caring is distant to environmental concerns, yet it is not non-existent. Referring to Guattari's concept of ecosophy, Braidotti argues that in order to fully comprehend the subject within the issue of environmental crisis, the persons' three essential ecologies need to be analyzed: namely, "that of the environment, that of the *socius*, and that of the psyche" (2006a, p. 127). A transversal, and collective connection needs to be created in order to anticipate a sustainable solution. Braidotti states that "it is crucial to see the interconnections among the greenhouse effect, the status of women, racism and xenophobia, and frantic consumerism" (2006a, p. 127). It is the emphasis on the interconnection of the issue that calls for a collective need to care.

According to Braidotti, the classical philosophy concerning the ethics of care does not provide an answer to why someone should care about this subject. Instead she adapts the ethics of care to a contemporary atmosphere; a "new electronically mediated ethics of care" (2006a, p. 120). Albeit, advanced capitalism accepts and engages in a relationship with all that lives in favor of economic and scientific profit (Braidotti, 2017, p. 86). It is the same capitalism that creates the space for digital caring.

Advanced capitalism both introduces the consumers with new gadgets and technologies, but at the same time makes them obsolete by ceaselessly introducing something new. "Contemporary society is in fact fascinated to the point of obsession by all that is 'new'" yet this does not mean that there is at the same time a nostalgic reaction to what has been (Braidotti, 2006a, p. 2). Braidotti gives the example of the

infamous Tamagotchi's and their digital burial as an emotional parting which indicates the "capacity to develop caring relationships towards inanimate, inorganic, functional, fictional and electronically interactive 'others'" (2006a, p. 121). This capacity proves to be the direction to which Braidotti wants to push 'care' because she firmly believes that change can occur only when there an affinity toward it. This idea of caring about inanimate objects, such as electronic devices, is further discussed in chapter five through the DIY practice of circuit-bending. One of the artists discussed in chapter five is Benjamin Gaulon, who organizes workshops that revolve around tinkering and circuit-bending in order to ignite ethical care that Braidotti describes. Gaulon's goal is to promote sustainability—in this case for electronic waste.

2.3.3 Nomadic Philosophy and Sustainability

According to Braidotti, "philosophical nomadism is a *bios*/*zoe*-politics" (2006a, p. 318). From this it is understood that it is inevitably involved in politics and heavily transversal, because it is by nature complex. Braidotti emphasizes here the interconnections of the issue at large, it is quite impossible to consider environmental crisis as a separate topic. In this politics that combines *bios* and *zoe* it creates a unitary idea that can best be described as 'we.' This 'we' therefore stands for an "interconnectedness and the argument that 'we' are all in this together"; this idea is a concept that goes well with the "nomadic, non-unitary vision of the subject which has dissolved the boundaries of bourgeois individualism and redefined itself as a collective, multi-layered yet singular entity" (Braidotti, 2006a, p. 119).

The 'we' that the nomadic philosophy calls for creates the foundation for different approaches to social status. Braidotti (2006) argues that nomadic politics ultimately has two fundamental aims: to disengage from existing norms and to construct

"dynamic transversal interaction" (p. 134). This transversal rhizome creates an "bio-centered egalitarianism as ethics," placing great importance on *zoe* (Braidotti, 2006a, p. 129). This approach decentralizes the human and engages in a politics that aims at showing the problematics of a hierarchy in which the human dominates over all non-human subjects with incredible power. As it can be observed from the current ecological crises, this hierarchy is not sustainable in the long run.

It can be concluded that becoming-nomad is complex, as it breaks down schools of thought and engages in bringing to life new ones. Nomads follow an irregular path full of obstacles and hinderances, it is therefore that the only path for a sustainable future is through complexities and the obstacles that arise in politics. In order for this path to be sustainable, nomadism does not engage in anthropocentric approaches, it rather disengages itself from it. Since tranversality is crucial to this nomadic approach, "animals, insects, plants and the environment, in fact the planet and the cosmos as a whole, are called into play" (Braidotti, 2006a, p. 66). This creates a planetary political arena in which the nomadic subject claims "a non-unitary vision of the subject that stresses nomadic complexity and open-endedness" (Braidotti, 2006a, p. 92). It is important to note that nomadic subjects are not "quantitative pluralities, but rather qualitative multiplicities," this means that they have the intensity to affect change and initiate becomings (Braidotti, 2006a, pp. 93-94).

As mentioned, Braidotti's argument on nomadic philosophy is influenced in part from Spinoza's concept on monism. Spinoza refuses the thought that the earth subjects consist of the dualisms of internal and external dynamics; hereby, he refuses a mind/body separation and hierarchy. He argues instead that subjects are "materially embedded" and "in process," in a similar manner to nomads in a rhizome of connections with "forces, entities, and encounters" (as cited in Braidotti, 2016, p.

383). This entails that all things on the earth grow through diverse yet individual sequences. It is this form of thinking that allows multiple becomings to create transversal relations, and the expansion of subjectivities through means of becoming.

How then does nomadic philosophy engage in sustainability? Sustainability is described by Braidotti in a number of ways. First of all, in order to preserve a sustainable future, becoming-nomad is a must according to Braidotti. Secondly, sustainability as the word indicates, is about how much a body or a subject can sustain itself, and about how much a body or subject can endure external forces that break, shape, mend it. This includes natural phenomena like the weather or earthquakes. Likewise, from a different perspective, this view on sustainability also includes the exhaustive use of natural resources. In the case of this study it is not the use of natural resources that causes the environmental havoc, but rather the manner in which it is used–more specifically, in the case of this thesis's topic, the manner in which it is not re-used. Another aspect of sustainability that Braidotti mentions is the approach to the subject in terms of its "embedded sense of responsibility and ethical accountability for the environments she or he inhabits" (2006a, p. 137). It is in this instance crucial to remember that becoming-nomad is a creative process that engages in resistance to the norm. Nomadic philosophy and its take on sustainability therefore acts as a form of activism to sustain a planet on which extreme external forces—human forces—do not wreak havoc on the environment. Hence, it can be concluded that "becomings are the sustainable shifts or changes undergone by nomadic subjects in their active resistance against being subsumed in the commodification of their own diversity" (Braidotti, 2006a, p. 137).

2.3.4 Nomadic Philosophy in Artistic Endeavors

I have laid out the concept of becoming-nomad and how this philosophy engages in micro-political activities to ensure a sustainable future. How is this philosophy then utilized in the upcoming chapters? The artists presented—such as Cohen and van Balen, Dishaw and Gaulon—initiate nomadic artistic projects that are advocacies for a more sustainable approach in the consumption of electronic devices. The work of the four artists I mentioned are respectively analyzed in the upcoming three chapters. Another aspect in which nomadic philosophy is utilized in this study is through viewing the metals used in electronics—such as copper, gold, aluminium, tantalum—as nomadic subjects. In nomadic philosophy, activities against the norm are not only at the level of the human. The artwork *Without Us* (2015) by Chatonsky for example, is an installation created with one obsolete computer. This computer is a single device that is portrayed as being forgotten by its human consumer. Yet the device itself speaks for many other devices that are scattered at landfills across the globe. This installation is analyzed further in chapter three. As Braidotti emphasizes, it can be said that 'we' are in this together—in this planetary political arena that is the earth—yet this unitary 'we' does not come at the loss of an embedded individual entity. Here 'we' includes all entities that belong to the earth, therefore this idea can also be applied to the metals and other inanimate materials that make up electronic devices and are used in the artworks presented in this study. The artworks that this study exemplifies are resisting the commodification of a humanistic ideal for exploitation. In conclusion, no matter what the artists' ultimate idea or goal is, an underlying political resistance for change exists in each and all projects analyzed in this thesis.

2.4 Parikka's Approach to Media

New media scholar Jussi Parikka takes a novel perspective toward media. Observed broadly, media studies engage in the sociological, political and psychological impact of communication technologies. This includes the analysis of social media platforms and the use of the internet. But Parikka shifts the focus from media content to media hardware. In *A Geology of Media,* Parikka takes a closer look at the physical materials that create media technologies. In the context of this study, electronic devices and media refers to communication technologies, such as mobile phones, televisions, computers, etc.

In *A Geology of Media,* Parikka takes a look at their ecological implications of media. Even though Parikka does not propose a new theoretical framework, he uses existing theories such as that of Deleuze and Guattari, Braidotti and others to address the gap that he sees within media studies. His thoughts on new media create the academic perspective that allows for the analysis of artistic endeavors such as the works of Reed Ghazala, Walter Giers, and Benjamin Gaulon, who engage in practices such as circuit-bending and tinkering. Although these artistic projects are scrutinized predominantly through the Deleuzian-Guattarian thought and Braidotti's formulations, it would not have been possible for this thesis to be plausible without Parikka's proposed discussions and the gap he addresses within media studies. In "Zombie Media: Circuit Bending Media Archeology into an Art Method" (2012) written by Garnet Hertz and Parikka, the authors examine the role of artworks in addressing this beforementioned gap within media studies. In his book *A Geology of Media,* Parikka again touches upon the important role that artists play in addressing ecological issues regarding the cumulation of electronic waste—and in relation mining practices. While he attends to this issue, he does not go in-depth, thus does

not analyze these artworks. Considering this a slight gap in Parikka's arguments, this thesis intends to find itself a place within that gap, by scrutinizing artistic projects that use e-waste.

2.4.1 From Naturecultures to Medianatures

Natureculture is a term coined by American scholar Donna Haraway. Natureculture is described to be an amalgam of nature and culture that exists in separate manners and is considered to be socially formed (Fuentes 2010; Haraway 2003; Malone & Ovenden 2017). It derives from and in opposition to the philosophy that everything exists in dualism such as woman/man, animal/human and nature/culture. Haraway argues that nature and culture cannot be any longer separated because human culture by means of advanced technologies has dominated nature in almost every aspect. Human technologies have shifted the natural balance that once existed. It is no longer possible to "decipher such spheres separately" (Parikka, 2015, p. 13). This disrupted balance can also be seen in Parikka's articulations which are in line with this concept. Parikka argues that nothing on planet earth is out of human reach as he states that "we are living a new geopolitical rush" in which we look for "deeper hidden resources of petroleum and critical materials from metals to uranium" and we do so without a regard for a natural balanced order, instead it is profit that promotes consumer behavior (2015, p. 26). There exists an interconnected state—a double bind—in which natural resources make technologies possible and technologies make it possible to reach untouched areas of the earth.

Motivated by Haraway's concept naturecultures, Parikka argues that medianatures is similar but "with a specific emphasis on (technical) media culture" (2015, p. 14). Alternatively, in response to Parikka, Braidotti coins the term "medianaturecultures" (2016, p. 383). She also states that by replacing naturecultures with medianatures,

Parikka displaces “the centrality of human life (*bios*) in favor of the nonhuman (*zoe*)” (2016, p. 383). The nonhuman factor in medianatures exists in the form of the geophysical reality of media culture. The proposed term medianaturecultures, then includes the human as cultural connotations are an important factor. Therefore, even if the triumph of *zoe* sounds to be a centrality here, Parikka states that this nonhuman factor is closely tied to the relations of power and labor (2015). Indeed, including culture is related to the “underpaid laborers in mines or in high-tech entertainment device component production factories, or people in Pakistan and China sacrificing their health for scraps of leftover electronics” (Parikka, 2015, p. 14). Although these people are not considered to be nonhuman factors within medianatures, they are a significant part of media cultures in which they are treated as nonhuman factors. The term medianaturecultures is important because it combines three spectrums that are crucial in understanding electronic waste. For example, the fluidity of gold can be attributed to a cultural impact. Gold is valuable as a metal for jewelry but at the same time it is discarded as e-waste. Yuma Fujimaki creates jewelry from metals he recycles from electronic waste therefore the concept of medianaturecultures is further discussed in chapter four.

2.4.2 Media Materialism and the Source of Life in Technology

In media theory media materialism refers to the use and place of media technologies in our social and cultural life. Instead, Parikka proposes a different media materialism, one that focuses on “temporal and spatial materialism of media culture” (2015, p. 3). Braidotti states that “the emergence of geology as a term of reference for media and cultural criticism is emblematic of this shift of paradigm” (2016, p. 381). This shift indicates an “earthbound, terrestrial kind of materialism” (Protevi,

2013; Braidotti, 2016). Therefore, Parikka's approach to media materialism differs essentially from the materiality that media theory proposes.

Parikka's book *A Geology of Media* evolves around the idea that there is in fact a thing such as a geology of media. This means that the materials that make media happen "come from the earth's crust" (Volkart, 2017, p. 106). It is Parikka's most central argument that besides analyzing media in a social and cultural context, a geophysical approach is needed as well. In today's environment, this perspective is of great importance as it questions and shapes the political and environmental debate. His emphasis lies on the political and economic interests that happen behind what enables media technologies. Therefore, media geology does not only represent the metals in electronics, but also the industry that mines these metals and its close relation to climate change.

The existence of cumulated electronic waste indicates that the physical, earthbound materials that make up media are categorized as the other. The current approach to geological resources is as if it is an unending source for raw materials. At the same instance, it is acknowledged that this is not true and instead of proposing a sustainable approach, the search for untapped resources continues as "arctic regions, dangerous areas of Africa, Afghanistan, and, for instance, the deep seas" prove to be the next areas that are thoroughly searched for raw materials such as petroleum and different kinds of metals (Parikka, 2015, p. 26). For economic reasons, it is easier to search for raw materials than to recycle or upcycle, it is therefore that a cumulated amount of electronic waste sits at landfills leaking toxicity into the earth. Electronic waste is categorized as "hazardous waste because it contains chemicals at concentrations that are potentially toxic to humans, animals, and the environment"

(Alabaster et al. 2013, Adie et al. 2014, Zeng 2017, p. 4). This toxicity exists of "lead, cadmium, mercury, barium, and so on" (Parikka, 2015, p. 49).

Essentially, it is the earth that enables media technologies not only by means of providing raw materials, but also through the connectiveness of communications as "the earth is part of media both as a resource and as transmission" (Parikka, 2015, p. 30). If this is the case, and our cultural and social behavior relies on the earth; why then do we treat it like it is expendable?

It is vital to note that the opposed argument against current practices is not in an anarchistic voice, instead it seeks to eliminate the dominant drive for profit and urges for a sustainable approach. The cumulation of electronic waste does not have to indicate an anti-capitalistic regime or a future dystopia. Instead, it "focuses on garbage not as a technological problem, or even as a narrow environmental problem, but as a pervasive social process that connects us all" (Feldman, 2009, p. 42). It is only when sustainability becomes a collective goal that manufacturers will develop to reach this goal. Innovative solutions emerge only when the problem itself is accepted and is cared for. Here I want to give the example of an innovative design named *Gumshoe* (gumshoe.amsterdam, n.d.); a shoe created of gums that were collected from the streets of Amsterdam. This design emerged as a solution for the gum problem in the city. This project can relate to the work of Gabriel Dishaw, who creates decorations made almost solely from obsolete electronic devices. His work is further discussed in chapter four.

2.4.3 Zombie Media and Scrap Art

The name zombie media is coined by Hertz and Parikka to define obsolete media. The reason they use the word zombie is because electronic waste does not decay or

rot similar to other types of waste. It is in no means biodegradable, instead it is the "living dead of discarded waste" as it literally "signals death, in the concrete sense of the real death of nature through its toxic chemicals and heavy metals" (Hertz & Parikka, 2012, p. 427). Thus, it refers to the idea that electronics should not be considered as waste, because it is not practical in the long run and has many harmful side effects.

The repurposing of consumer commodities as artistic projects is not novel, the infamous *Bicycle Wheel* (1913) or *Fountain* (1917) by artist Marcel Duchamp is one of the first examples. The repurposing—also known as upcycling—of waste materials gives it a new meaning. This meaning is highlighted especially in the case of waste that is non-biodegradable. As Hertz and Parikka (2012) state clearly, electronic media or zombie media "either stays in the soil as residue and in the air as concrete dead media, or is reappropriated through artistic, tinkering methodologies" (p. 430). The tinkering methodologies that Hertz and Parikka hint at is circuit bending or the DIY culture that likes to fix broken electronic devices. These forms of artistic practice use electronics that are no longer used. The idea is that by tinkering with these electronic devices they can be made into something else or prolong its life span. This practice on its own redefines the original purpose and meaning of the device. In most cases the practice of circuit bending creates a functioning new device. As will be demonstrated in chapter five, considered to be a pioneer in electronic arts, artist Walter Giers uses the practice of circuit-bending to create interactive installations. As a result of tinkering, his works each produce a unique sound. Art practices that reuse dead media bring once again "life for such objects" and rid them of being categorized as garbage (Hertz & Parikka, 2012, p. 429). In a different perspective, as chapter three will go on to argue, artist Chatonsky points out

the irrelevance of electronics without humans using them in *Without Us* (2015). He approaches this perspective by assuming the perspective of the device itself. This approach attributes the electronic devices emotions of abandonment, loneliness and meaninglessness therefore this can be linked to the ethics of care that Braidotti mentions.

2.5 Conclusion: A Sustainable Assemblage

In conclusion, for a sustainable future, for the people to come, "in the midst of an ecological crisis a more thorough non-human view is needed" (Hertz & Parikka, 2012, p. 429). Whether this view is accomplished or not will eventually define this era, as it is evident that "science and engineering has a significant impact on the earth" (Parikka, 2015, p. vii). This impact does not need to be as destructive as it is now. Guattari states that "the only true response to the ecological crisis is on a global scale, provided that it brings about an authentic political, social and cultural revolution" (1989/2000, p. 28). His belief in such a sustainable revolution lies through what he calls ecosophy, a concept Braidotti also deems essential in becoming-nomad. Instead of trusting such power to corporations and profit-driven manufacturers, it is important that the people play a significant role in the say of their futures. It is therefore that art plays a crucial role in the path toward sustainability. Art yields the power to reach the people and influence becoming-nomad.

Overall, the theories that compose this chapter provide together an assemblage which provide the backbone of this thesis. Accordingly, the next three chapters analyze the artworks that deal with the afterlife of electronic waste through these theoretical perspectives.

CHAPTER 3

A CRITIQUE ON THE CATEGORIZATION OF OBSOLETE ELECTRONICS AS WASTE

3.1 Introduction

The previous chapter laid out the theoretical framework for this thesis; this chapter and the following two chapters analyze artworks that use obsolete electronics. This chapter is the first of the analytical chapters and its theme is concerned with a political and philosophical stance against electronic waste. The artworks presented in this chapter are made up of sculptures, installations, exhibitions and photographs. Although the medium of the works of art change, they share a similar perspective. Each artwork claims a philosophical and political argument that clashes with current practices concerning obsolete media.

The works presented in this chapter shift the focus of its audience from the content of media—internet, apps, social media etc.—to the makeup of media. This makeup does not indicate the parts that complete the device, for example the batteries, camera, design but rather the actual composition of the hardware such as the required raw elements that are vital for a functioning device. These works therefore engage their audience in a debate that is often neglected: ‘what was before and what is after I have used this device?’ Essentially, the questions that this chapter aims to explore are such

as: ‘What is considered waste?’ or ‘What meaning do electronic devices have when they are abandoned by humans?’ or even simpler, ‘What processes does an electronic device go through before and after it reaches the hand of its temporary host?’ and ‘Where do electronic devices go once we stop using them?’ In the same manner, this chapter analyzes these questions through the proposed theoretical framework established in chapter two. These questions provide a gateway to explore concepts such as becoming, assemblage, territorialization, and sustainability.

The artists whose artworks are featured in this chapter are as follows: artist duo Revital Cohen and Tuur van Balen, Chris Jordan, Katherine Behar and Grégory Chatonsky. The common and reoccurring theme in their artworks is the brief temporality of electronic devices. The use of electronic devices is relatively short due to a number of contributing factors, and this leads up to the issue of waste. The artworks, in their own manner, critique the accumulation of e-waste and its impact on the environment. Therefore, it can be concluded that the beforementioned artists provide a political and ethical critique through their artwork.

For instance, Cohen and van Balen manually recycle metals from parts such as motherboards and hard drives to create unique ores; in the collection of photographs titled *Retour* (2015) they scatter gold at a Congolese mine that they retrieved from obsolete motherboards. Further American photographer Jordan travels the United States between the years (2003-2005) and takes photographs of landscapes that exemplify American mass consumption. These photographs mirror the hidden realities behind consumerism and present the bigger picture that is often neglected. Next to the harsh realities Jordan presents artists Chatonsky and Behar focus their installations on the future of archeology and the meaning of electronics without humans. Their work takes place after humans have gone extinct as the result of

harmful practices that impact the climate negatively. Overall, this chapter explores a political and ethical argument that originates from these artworks.

3.2 A Return to Roots in the Works of Revital Cohen and Tuur van Balen

The artist duo Revital Cohen and Tuur van Balen are based in London. Together they have a number of artworks that are concerned with political and ecological implications of the manufacturing of electronics. They create mixed media content such as installations, photographs and videos. They explore "the juxtaposition of the natural with the artificial" (V2: Tuur van Balen & Revital Cohen, n.d.). Overall, the artists duo is concerned with multiple issues that are the result of an overpopulated earth, and its collective participation in mass consumption.

This section takes a closer look at three of their artworks. All three works share a common theme; a return to roots. For example, resources that are mined from the earth find their way back—with the help of the artists—to their site of origin or natural form. The context of the three artworks is as follows: a Dutch furniture manufacturer goes bankrupt and the contents of their warehouse are auctioned online. Cohen and van Balen buy all electronic devices. It is extremely difficult to find electronic waste in developed countries since electronic waste is shipped to countries such as Ghana, India and China. Cohen and van Balen start mining "from the other side of the supply chain," each object is "unscrewed, unglued, separated into parts" (Cohen & Balen, 2016, p. 333). By engaging in such artistic practices, the artists claim a political stance against the shifting value of nature itself and the laborers that contribute to the mining of rare earth elements. Both aspects are a crucial factor in sustainability practices for the environment. The artists show that the earth as well as the (cheap) laborers are categorized as the other. Therefore, in all three of their works presented below they criticize the fluctuating value of mined

chemical elements. Their value changes in relation to the circumstances. Raw materials are more valuable because the cost of retrieving them—through cheap labor—is less pricy, to which I shall return shortly.

3.2.1 A Nomadic Voyage Back Home: Gold

In *Retour*, Cohen and van Balen manually recycle gold from a number of electronic devices. Most of the devices from which they harvest rare earth elements are made in China (Cohen & Balen, 2016). This means that the devices are assembled in China, while the chemical elements that make the technologies possible are mined from a number of different places on the earth. One of these places is Congo, which is a mineral rich country whose soil is the "birthplace of objects of desire and destruction that are actualized in other realities, in other parts of the world" (Cohen & Balen, 2016, p. 333). Due to the rich contents of the Congolese soil, most technological objects include a part of Congolese earth. Just as laptops and mobile phones exist all over the earth, "Congo exists in all these technological objects" (Cohen & Balen, 2016, p. 333). The earth elements therefore can be considered to be nomads—scattered globally—that are on the journey of becoming-nomad.

To further discuss the nomadic becoming of gold, it is important to know how Braidotti understands Deleuze's nomadology. Braidotti states that Deleuzian nomadology is "a philosophy of immanence that rests on the idea of sustainability as a principle of framing" which then integrates a "subject's intensive resources, understood environmentally, affectively and cognitively" (2006b, p. 135). This means that a subject employs a time that is the "active tense of continuous 'becoming'" (Braidotti, 2006b, p. 135). Deleuze and Guattari adopt the Bergsonian take on time which is known as duration. Deleuzian scholar Tamsin Lorraine describes duration as a dynamic time from a "perspective of immersion" as a

"durational whole made up of heterogeneous durations that includes nonhuman as well as human processes that are always unfolding toward an unpredictable future" (2011, p. 3). This understanding of time then proposes a subject that goes through "sustainable changes and transformation" which is consequently represented in a "community or collectivity" (Braidotti, 2006b, p. 135).

Figure 1. Cohen & van Balen, *Retour*, 2015. C-type print. 75 × 75 cm

Figure 2. Cohen & van Balen, *Retour*, 2015. C-type print. 75 × 75 cm

In *Retour* the gold is mined from electronic devices. Although it is destined for different durations and therefore different becomings it finds its way collectively

back to where they originate. Gold, in this case, as a nomadic entity is in a state of "in-between: a folding-in of external influences and a simultaneous unfolding-outwards of affects" (Braidotti, 2006b, p. 135). Therefore, collectively the unfolding of metals in e-waste is a resistance to the marginalization of the earth as well as the miner.

Therefore, it can be said that *Retour* argues for the otherness of the earth as well as the otherness of the laborer. *Retour* represents not only the miner that collects the required chemical elements but also the laborers on the chain of assembling the electronic devices. The others in this case have become disposable in favor of capitalistic profit. But since we consume technology rapidly, "the supply of some raw materials is increasingly difficult to meet the growing demand from electronics manufacturing" (Zeng, 2017, p. 2). This raises a red flag on the "future limitations on manufacturing based on the supply of valuable metals, precious metals, and rare metals" (Zeng, 2017, p. 2). Maxwell and Miller argue that it might be the consumers' "obsession with immediacy and interactivity via networks" that "[inhibits] our awareness of the long-term harm to workers and the environment" (2012, p. 4). The change in balance—as we consume more than what the earth yields in rare earth elements—also shifts the value of these chemical elements. *Retour* exemplified the paradox of value by juxtaposing the miner with the recycled gold from electronic waste. This shift in value is also further discussed in the artworks presented in chapter four.

It can therefore be argued that the value of a subject changes according to its monetary index. The regime of capitalism adopts a human-centered approach to the globalization of the earth. Braidotti argues that "globalization means the commercialization of planet earth in all its forms" this includes all subjects related to

the earth—even human labor (2006a, p. 98). According to Haraway this signals the diversion of the ecosystem "into a planetary apparatus of production and the global infotainment apparatus of the new multimedia environment" (as cited in Braidotti, 2006, p. 99). In a similar view, Guattari states that the earth is extensively put under stress through techno-scientific transformations. He believes that this rapid consuming of natural resources creates an "ecological disequilibrium" and that it "threatens the continuation of life on the planet's surface" (1989/2000, p. 27). It is my contention that Guattari rather focuses on the human life on the earth rather than *all* that lives. *Retour* on the other hand argues for the re-balance of what is considered a resource and what is considered as waste. Thus, *Retour* argues for the triumph of *zoe* over the power of *bios*. This is crucial because *Retour* does not exclude the human laborer, rather it includes all forms of entities that belong on the earth. In this manner, *Retour* proves to be a nomadic entity that unites all human or non-human factors in its nomadic becoming.

3.2.2 Ores Once Again

The following two artworks by Cohen and van Balen are the installations of artificial ores titled *H/AlCuTaAu* (2014) and *B/NdAlTaAu* (2015). Even though they are artificial—as they were created by hand by the artists—they symbolize the eternity of the rare earth elements. The ores are a combination of a number of rare earth elements, such as aluminum, copper, tantalum, and gold. Under normal condition, the obsolete electronic devices become part of a growing collective of electronic waste. Rather than dissolving in the soil or breaking apart into dust, the metals endure external intensities. These external forces start from the mining of the earth elements and continue through its use in necessary technological devices. Once the devices are used and their predetermined lifespan is over, they are disposed. Along

this journey, each assemblage of elements—devices—are assembled somewhere else than they originated and used by someone across the globe. This indicates the "singular, but collectively bound subject" that is the electronic device (Braidotti, 2006a, p. 136).

Figure 3. Cohen & van Balen, *H/AlCuTaAu*, 2014, Aluminium, copper, gold, tantalum, whetstone, 12 x 7 x 6 cm, De Brakke Grond Amsterdam

This collective yet singular entity in the case of *H/AlCuTaAu* and *B/NdAlTaAu* exemplifies a heterogeneous assemblage. In a Deleuzian-Guattarian perspective, this emphasizes the "coming together of forces into relatively stable configurations with particular capacities to affect and be affected that have specific durations" (Lorraine, 2011, p. 12). As previously mentioned, the two ores are a transitory heterogenous combination of rare earth elements that are collected from electronic devices. Each of the rare earth elements (gold, tantalum, aluminium etc.) has its own duration, meaning that the dynamic time it is experiencing is unique to the element itself. Each rare earth element that is presented within the artificial ores has its own rhizomes. This indicates that the element is the result of intensities and forces presented at the time of its formation. Yet, this formation is not unique to one spot on the earth, rather

it exists as a resource in different environments; but its chemical composition is the exactly the same. In the unique case of *H/AlCuTaAu* and *B/NdAlTaAu* the chemical elements are in a heterogeneous configuration with each other. This assemblage consists of different elements that are united on the same journey. This journey starts at their retraction from the earth for the purpose of engineering electronics. Together they are combined to create a functioning device and, in the end, they are discarded in e-waste landfills.

Figure 4. Cohen & van Balen, *B/NdAlTaAu*, 2015¸ Neodymium, Aluminium, Gold, Tantalum, 14 x 9 x 7 cm, Thyssen-Bornemisza Art

The assemblage that Cohen and van Balen have established with *H/AlCuTaAu* and *B/NdAlTaAu* are electronic devices turned inside out. These ores represent the assemblage that electronic devices already are. Each electronic device is a combination of metals and human engineering. *H/AlCuTaAu* and *B/NdAlTaAu* represent therefore an assemblage that includes the intensity of both natural and artificial, a combination of nature and human. Although this assemblage does not necessarily create a different compound, it does generate a new rhizome. Referring once again to example of the wasp and orchid, Deleuze and Guattari state that the

"wasp and orchid, as heterogeneous elements, form a rhizome" (1980/1987, p. 10). This established rhizome then, is met with different intensities and external forces. Parikka states that media never dies. Therefore, together with Hertz, he makes up the term of zombie media. How exactly can we observe the zombie in media within these ores?

Figure 5. Cohen & van Balen *B/NdAlTaAu*, 2015¸ installation view, Thyssen-Bornemisza Art

The chemical compounds that are mined from the earth are processed to fit the requirements of how they are used. The mining of the elements itself is also a process of change as it displaces the rare earth elements from its environment. Once these elements are combined to create the electronic device, the natural or rather raw form of the compound is lost. Yet, natural does not always mean that it is good for the environment because the heavily processed elements—such as heavy metals—start to bleed toxicity into the earth once they are discarded (Pourhossein & Mousavi, 2018). The rhizomatic formation of rare earth elements are "created as an in-between space of zigzagging and of crossing: nonlinear, but not chaotic; nomadic, yet

accountable and committed; creative but also cognitively valid; discursive and also materially embedded" (Braidotti, 2006a, p. 5).

Figure 6. Cohen & van Balen, *H/AlCuTaAu*, 2014, installation view

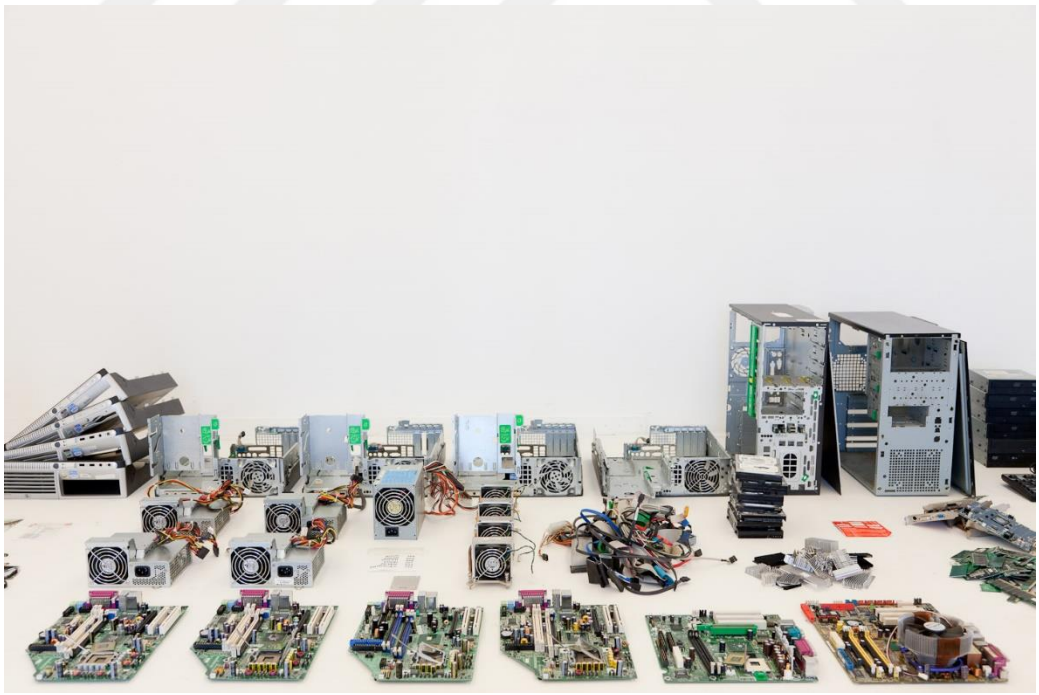

Figure 7. Cohen & van Balen, *B/NdAlTaAu*, 2015¸ installation view

As previously mentioned, the rare earth elements can be argued to be nomads that in the case of the artworks presented above, come together to unite and resist the external oppressions that consider them to be of no value, as waste. “Trash travels,” in this respect the nature of trash is nomadic (Zubiaurre, 2016, p. 17). It is nomadic in the sense that waste is often transported away from the cities, and in some cases away from countries. The following section takes a closer look at the grand scale of electronic waste as photographed by Chris Jordan.

3.3 Landscapes of Mass Consumption with Jordan

Chris Jordan is an American artist and photographer based in Seattle. Jordan’s work is heavily influenced by American mass consumption as he returns to its outcomes in most of his works. His collection of photographs titled *Intolerable Beauty: Portraits of American Mass Consumption* (2003-2005) consists of landscapes of garbage from across the United States. Jordan’s work in general deals with issues of waste, with extra emphasis on cumulated waste. Stating his intention about his collection, Jordan notes that individually we are anonymous yet as consumers we are united in a journey what he calls “a slow-motion apocalypse in progress” (Jordan, 2005). Here the artist emphasizes the question of how long the planet earth and its self-regulating ecosystem can endure the intensities that are inflicted by humans. The theme of a dystopic future in which humans become extinct can be sensed in all of the artworks presented in this chapter. Through his photography, Jordan reaches a critical and political stance concerning the cumulation of e-waste.

Intolerable Beauty: Portraits of American Mass Consumption consists of forty photographs. These photographs capture sceneries of human generated waste as the result of mass consumption. The first six photographs listed on the artists website are of electronic waste. Further the collection exists of images from all sorts of waste: for

example, an artificial yet large hill of sawdust, or stacks of old automobiles. Albeit, to stay within the context, only the photographs of e-waste are included in this study.

3.3.1 The Beautiful Mess of Modernity

The collection of photographs in *Intolerable Beauty: Portraits of American Mass Consumption* have the effect of creating a shock. Garbage is often out of the sight of the global consumer. It is collected and brought to outskirts of cities, and in some cases to other countries; thus, "what is cast off is both out of sight and out of mind" (Feldman, 2009, p. 42). Jordan travels across the States in order to capture these 'junkscapes'—as Zubiaurre (2016) describes. To Jordan the landscapes of garbage represent an eerie dystopic future.

It is widely accepted that the prevention of waste has a greater positive outcome in contrast to current waste management systems such as landfilling and recycling (Gentil et al.,2011, Johansson & Corvellec, 2018). Therefore, by taking the photographs of the landfills, Jordan initially tries to awaken the self-conscious consumer. In a way, Jordan tries to ignite a sense of care in the consumer. Zubiaurre observes that Jordan's *Intolerable Beauty* series represents a "monothematic photographs of carefully separated items, such as discarded mobile phones, circuit boards, phone chargers, spent bullet casings, cigarette butts, diodes, broken glass, crushed cars, and even sawdust mountains" (2016, p. 26). It is my contention that the photographs of categorized waste highlight the sameness of the objects.

The separation of objects has a greater potential to influence a sensation. It represents the scale of the global issue, because in the end "garbage is global" and these junkscapes can observed across the world (Zubiaurre, 2016, p. 34). The cell phones from a junk site in Atlanta provide a context for the amount of cumulation. It is

important to note that this photograph is taken in 2005. Since, the use of mobile phones have risen incredibly. Today, the very young as well as the very old use mobile phones.

Figure 8. Jordan, *Circuit boards #2*, New Orleans, 2005, 44 x 57"

Figure 9. Jordan, *Cell phone chargers*, Atlanta, 2004, 44 x 66"

The landscapes of electronic waste also provide a scope of "just a few of the ways that media technology has contributed to climate change, pollution growth, biodiversity decline, and habitat decimation—the constituents of our global ecological crisis" (Maxwell & Miller, 2012, p. 2). At the same time, these junkscapes also mirror the natural and artificial, the human and non-human factor of this waste. These "landfills are not lunar landscapes, eerie geologies devoid of any human presence, but 'real' and earthbound loci heavily infused with human presence and responsibility" (Zubiaurre, 2016, p. 27). These sites of waste do not solely exist of electronics that no longer have a functionality, or that are broken but rather consist of objects that are in a way "thoroughly defetishized" and that have fallen out of "the realms of desire, exchange, and use" (Kantaris, 2016, p. 54). Volkart argues that "as an inherent but also repressed side of modernity, waste is embarrassing, disrespectful, and something that maintains a deeply ambivalent status" (2017, p. 104). Therefore, it is often globally neglected and ignored by the consumer.

As mentioned previously, trash is initially nomadic especially, in the case of electronic waste. As it has already been established, the compounds of the electronic devices that Jordan represents in *Circuit boards #2* are already an assemblage that exists of individual intensities that are in the flow of becoming-nomad. Once these devices become obsolete, they continue their journey to different junkyards where they are left behind. Becoming itself does not necessarily focus on the physical transformation of the subject instead the Deleuzian-Guattarian thought emphasizes the transformation of the self "which is pressured from all sides by forces" (Sutton & Martin-Jones, 2008, p. 45). The "collective subject, pushed together through environmental, governmental, or social forces" ultimately comes "together in a resistance to these" (Sutton & Martin-Jones, 2008, p. 45). This resistance is a theme

that can be observed in Jordan's photographs. In *Circuit boards #2* the collection of electronic components look in perfect condition rather than incompatible. The metals are thus in unitary resistance against the external forces that mended them as heterogeneous assemblages.

According to Volkart, waste is as a "material, a metaphor, a method, and a medium that mirrors the effects of mechanization on the subject, society, and on art" (2017, p. 104). In a similar tone, Jordan states that he hopes the collection *Intolerable Beauty* "can serve as portals to a kind of cultural self-inquiry" (2005). Volkart emphasizes that "when it comes to dealing with waste today, whether artistically or otherwise, it is important to recognize that we are the ones who produce waste" (2017, p. 104). *Cellphone chargers* creates a relatable example as the charger is a component of communication technologies that is used often by the consumer. On the other hand, *Circuit boards #2* portrays the circuits that are a basic requirement in electronic devices. Not all circuits in discarded media are broken and no longer usable. These photographs then mirror the way in which media becomes obsolete; through planned obsolescence and a fast-paced development in technology. Both *Circuit boards #2* and *Cellphone chargers* represent the abandoned electronics that continue to be functioning, valuable components of the technological industry. In this sense it can be argued that Jordan's series of photographs yield the affective power to influence the deterritorialization of the subject viewing it. This Colebrook states that "what makes *art* is not its content but its *affect*" (2002, pp. 24-25). At the same time, according to Grosz, "art arrests this endless becoming into a becoming of its own: the art object now becomes sensation" (2008, p. 74). It is through the influence of affects—"to do with feeling and sensible experience," that the audience is deterritorialized by the artwork (Colebrook, 2002, p. 12). The act of

deterritorialization and the process of reterritorialization are “always connected” and “caught up in one another” (Deleuze & Guattari, 1980/1987, p. 10).

Feldman states that “in the contemporary developed world, garbage *en masse* only becomes visible when something goes wrong” (2009, p. 42). In a unique manner, “percepts and affects summon up a ‘people to come,’ not a public, an audience, but something inhuman” (Grosz, Chaos, territory, art: Deleuze and the framing of the earth, 2008, p. 77). This means that the selected few who are awakened through artworks such as that of Jordan’s—or any artwork presented in this study—create the so called ‘people to come.’ In a similar fashion, Guattari emphasizes that “this revolution must not be exclusively concerned with visible relations of force on a grand scale,” rather the “molecular domains of sensibility, intelligence and desire” have to be considered as well (1989/2000, p. 28). This indicates that change rises from the needs of the molecular, because actual change can only be observed when the individuals collectively participate in the same behavior. Although Jordan states that he believes that mass consumption inevitably paves the way for a dystopic future, his work still yields hints of hope and desire. The following section focuses on the works of two artists who tackle the possibilities of futures in which humankind has become extinct. Their imagined dystopias explore the meaning of electronic devices once they are abandoned and have become a part of the earth—once again—and what it entails.

3.4 Speculating the Future: A Closer Look at the Artworks of Artists Chatonsky and Behar

The final section of this chapter focuses on the artworks of two individual artists: Grégory Chatonsky and Katherine Behar. The artworks presented by Chatonsky are *Relics II: Mothers* (2010), *Telofossils II* (2015) (collaborative work with artist

Dominique Sirois), *Without Us* (2015) and the exhibition presented by Behar is *Katherine Behar: E-Waste* (2014). The analyses are in conjunction because of the thematic relevance that the works of art share. Both artists depict a future devoid of humans, in which they explore the notion of what it means to be a man-made electronic device. In their work they shift the focus from a human-centered view to the perspective of the abandoned electronic device; the perspective of an inanimate, inorganic, man-made device.

Grégory Chatonsky is a multidisciplinary French artist. His work is heavily influenced by "the telescoping between technological novelty and anticipated extinction" (Chatonsky, n.d.). Thus, he believes that rapid technological advancements and mass consumption will result in the anticipated extinction of humans. Furthermore, Katherine Behar is an interdisciplinary American artist based in Brooklyn. Her exhibition *Katherine Behar: E-Waste* is made up of sculptures and videos that premiered in 2014. The collection is made up of machine-made, handmade and 3D printed sculptures. In the artist's own words this exhibition is inspired by a science fiction scenario in which humans are extinct and "the gadgets are transformed into mutant fossils, encased in stone with lights blinking, speakers chirping, and fans spinning eternally" (Behar, 2014). Hence, Behar creates a multimedia exhibition that speculates a future in which electronics exist and function without human interference. All works presented in this section touch on topics such as the philosophical and environmental implications of such speculated futures.

3.4.1 The Future of Archeology

In the collaborative exhibition *Telofossils II*, Chatonsky and Sirois speculate the future of archeology as the burial site for electronic devices. The installation includes technological components such as the outer case of a computer, a keyboard and a

hard drive. After creating 3D scanned molds of the beforementioned objects the artists fill the molds "with coal, minerals, rare earth elements" to give the objects a fossilized appearance (Mufson, 2015). The chemical earth elements—such as aluminium, tantalum, plastic, etc.—that create electronic devices such as computers and hard drives that as presented in *Telofossils II* are often heavily processed. Chatonsky observes the static state of electronic waste as it is inorganic and non-biodegradable: it often stays unchanged after arriving at landfills. Volkart suggests that computers are merely "geology, sediments, and rocks" (2017, p. 106). Besides existing of geology as Volkart suggests electronics also exemplify an amalgamation of natural and artificial—artificial in the manner that the natural components are processed to such an extend it no longer is natural. Therefore, the mined elements are no longer raw elements. Medianatures is how Parikka describes the double bind between the earth and technology (2015). He states that "it is the earth that provides for media and enables it: the minerals, materials of(f) the ground, the affordances of its geophysical reality that make technical media happen" (2015, p. 13). This double bind becomes trifold when the future archeology that Chatonsky and Sirois anticipates in *Telofossils II* comes into play. The soil henceforth becomes a source for energy—life, resources—cumulated human data and history—human as well as pre-historic. On a more dystopic note, Chatonsky highlights in an interview that obsolete media "will live on longer than any human being" (Chatonsky & Sirois, 2015).

The heterogeneous elements in electronic devices such as computers and hard drives are in constant interaction with each other; together these elements make the device function. The shape of the fossilized computer portrayed in *Telofossils II* has

dedicated slots and chambers for electronic components like the hard drive to be placed. Simultaneously, the chemical elements that make up each component such as the hard drive are in an interaction as well. A hard drive for example is made up of either glass, ceramic, or aluminum. The disk is then coated with a thin layer of metal that can be magnetized or demagnetized. These chemical elements come together to store data. This device for example exists of chemical elements that are resisting the transgression of external environmental forces—this could be external forces while the device is used in daily life, and it also could be the extreme natural conditions it experiences in landfills. In this manner the rare earth elements (metals, plastic, ceramic) are nomadic entities that endure environmental forces through resisting change.

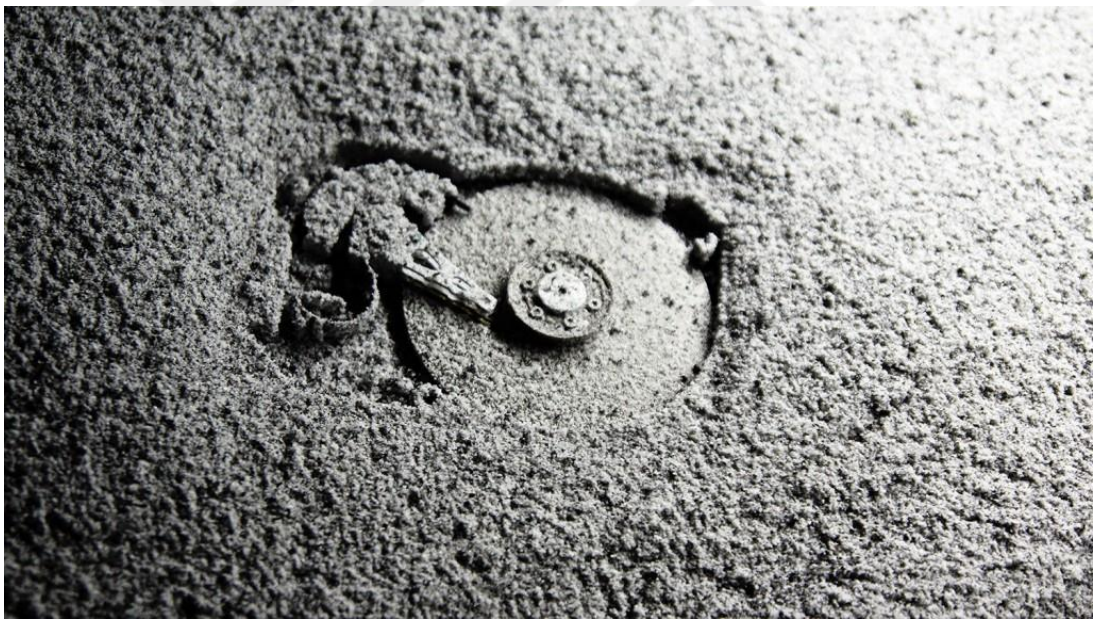

Figure 10. Chatonsky & Sirois, Telofossils II, 2015, Unicorn Art Center, a fossilized hard drive

Another aspect that Chatonsky focuses on in *Telofossils II* is the amount of data that is left in the earth's crust. In a way the hard drive endures intensities and thus protects the stored data. In a world after humans have become extinct, the data that humans have collected in the electronical devices will continue to exist. Future archeology provides a postmortem history of humankind. "*Telofossils* is a project

about time, and it is pitched as an archaeological and archival investigation of the future," Chatonsky emphasizes. Therefore, that the future of archeological excavation will consist of a treasure mine that exists in the form of cumulated information: a data reservoir (Parikka, 2015, p. 112). Everyday memories of people such as tasks, journals, photographs, medical records will continue to prosper even after the death of humans. Chatonsky's speculations have organisms dig the earth and find "the accumulated memories waiting to live again" (Chatonsky, 2015).

Figure 11. Chatonsky & Sirois, *Telofossils II*, 2015, Unicorn Art Center, a fossilized keyboard

Ultimately, Chatonsky's aim in this exhibition is "to put people in this strange and ambiguous position of contemplating their own extinction" and thus to create a sensation that has the potential to trigger nomadic becoming of the subjects interacting (Chatonsky & Sirois, 2015). This leads to an individual urge to demand sustainable practices, to ensure human life on the earth. The earth's layers have proven to be an indispensable site of information. The eras that the planet earth has been through can be identified through the soil. Hence, the statement that geology is not only about the layers of the earth, as it also represents a connection to "the climate change as well as the political economy of industrial and postindustrial

production" (Parikka, 2015, p. 4). Parikka (2015, p. 121) describes the exhibition as follows:

> For Chatonsky, this mix is a necessary way to make sense of the multitemporality of the looming catastrophe: the notion of the fossil addresses the slow stratification of a synthetic layer of technological rubbish. It refers to the aura of the accident that surrounds the technological of past decades and hundreds of years and transposes it to the future.

Thus, it is safe to state that a major theme that Chatonsky focuses on is that "the entire species" will become "extinct at some point" (Chatonsky & Sirois, 2015). In relation to other living beings, humans will inevitably leave behind mass produced waste, which is in some cases—like e-waste—extremely durable. "Until recently, human development had relatively little impact on the dynamics of geological time" (Swyngedouw, 2011, p. 69). Therefore, in Chatonsky's speculated future "the planet will be haunted by these millions of objects" that humans have left behind, and this cumulation is the future of archeology (Chatonsky & Sirois, 2015). The cumulation of waste left behind by humans can be considered as tracing of the technological advancements and achievements. The deeper one digs the more primitive the technologies become. Braidotti argues, *zoe* the non-human life is known to be the "dynamic, self-organizing structure of life itself" (2006, 2011, 2013, p. 60). Although e-waste is non-organic it "does not only accumulate; it also sediments, and can play host to and transport bacteria" (Volkart, 2017, p. 104). This shows that the cumulation of electronics on the soil create a unique ecosystem in which organic matter like bacteria thrive. Marine biologist Rachel Carson (1962, pp. 53-54) describes the continuous change of the soil as follows:

> The soil exists in a state of constant change, taking part in cycles that have no beginning and no end. New materials are constantly being contributed as rocks disintegrate, as organic matter decays, and as nitrogen and other gases are brought down in rain from the skies. At the same time other materials are being taken away, borrowed for temporary use by living creatures.

Carson's explanation of the configuration and re-configuration, the fluidity of the soil can be expanded to the becoming-earth of the planet itself. Deleuze and Guattari emphasize that the earth is the ultimate deterritorialized subject as it "is permeated by unformed, unstable matters, by flows in all directions, by free intensities or nomadic singularities, by mad or transitory particles" (1980/1987, p. 4). The planet earth is therefore life itself or rather constantly becoming in its essence. This signifies that life is innately in the process of configuration and re-configuration as an endless transformation and expansion of itself.

3.4.2 Abandoned and Alone: If Only Computers Had Emotions

In the technologically mediated modern era, electronic devices are inevitably used. It is extremely rare to see a person that does not make use of electronic devices. It can be predicted that as time passes technology will advance further by submerging human life into more technology. As much as a humans love their technological device, it finds its way, in one way or another in a landfill of electronic waste in a foreign country. Therefore, Hertz and Parikka argue that "in the midst of an ecological crisis a more thorough non-human view is needed" (2012, p. 429). This view is established by Chatonsky and Behar, by de-centering the man and approaching electronic devices as entities separate from humans. This view can be scrutinized in the works *Without Us* and *Relics II: Mothers* by Chatonsky and in the exhibition *Katherine Behar: E-Waste* by Behar.

Why is this non-human view so important? Colebrook argues that "there is always more than the actual world", because our human perceptions differ from other animals and beings (2002, p. 126). Put simply, the earth does not revolve around human beings. Sometimes, taking a step away from the situation that is

environmental crisis can change one's perspective. Chatonsky's ultimate aim is to bring forth sensations that will trigger a people to come. Consequently, this is the reason why—along with Hertz and Parikka—Colebrook emphasizes the need for a non-human view.

Figure 12. Chatonsky, *Without Us*, 2015, La Chambre Blanche

Figure 13. Chatonsky, *Without Us*, 2015, La Chambre Blanche

Taking a look at electronic waste from the sole perspective of the device itself still refers back to the human. The electronic device is created by humans for humans, therefore it is almost impossible to think of the device without referring back to its creator. In the case of Chatonsky and Behar's exhibitions, the inanimate device is attributed human traits, such as loneliness, abandonment and loss of purpose. These human traits make it possible for the audience to care for this lifeless object. The obsolete devices that are exhibited in the works of Chatonsky and Behar are depicted as functioning devices that have lost their overall value. This is probably due to the rapid advancements in technology. In *Relics II: Mothers*, Chatonsky covers once favored computer screens with a white cover. This gives the device the aura of a ghost. The images Chatonsky captures promote a sense of abandonment, a longing for human touch or a need for purpose. These devices no longer have a reason to exist without human interaction and as a result their value as a technological device no longer exists.

Relics II: Mothers (2010), depicts three computers that were some of the first personal computers manufactured. Chatonsky states that these devices are Commodore 64, ZX81, Oric Atmos, Apple IIe or Amstrad CPC 464. The white fabric makes the "old machines become invisible", but it also represents their current state as ghosts (Chatonsky, n.d.). By representing the feelings of loneliness, abandonment, and the lack of purpose, ultimately Chatonsky aims at igniting emotions of nostalgia in the viewer.

Figure 14. Chatonsky, *Relics II: Mothers*, 2010

Figure 15. Chatonsky, *Relics II: Mothers*, 2010

Similar to Chatonsky's reasoning of a future planet extinct of humans, Behar also depicts a future in which humans no longer inhabit the earth. What does this mean for electronic devices? In Behar's words these electronics are "transformed into mutant fossils, encased in stone with lights blinking, speakers chirping, and fans spinning eternally" (2014). In the exhibition *Katherine Behar: E-Waste* (2014) the fossilized device with a running text functions as the prologue. The text in the video states that the world is no longer habitable for humans, and continues as follows:

But what of all the gadgets those factories churned out, the always-on armies that once served the human race? Their plastic bodies prove impervious to eventual climate change and sudden catastrophe. Indeed, they hastened this. But without humans to program them, to direct their work and give them purpose, the devices persist in their empty routines. As years go by, the earth beneath them takes pity. The stony ground creeps toward the orphaned gadgets embracing their fragile frames to soothe and brace them for their burden of infinite work (Behar, 2014).

Figure 16. Behar, *Katherine Behar: E-Waste*, 2014, Tuska Center for Contemporary Art, fossilized USB fans

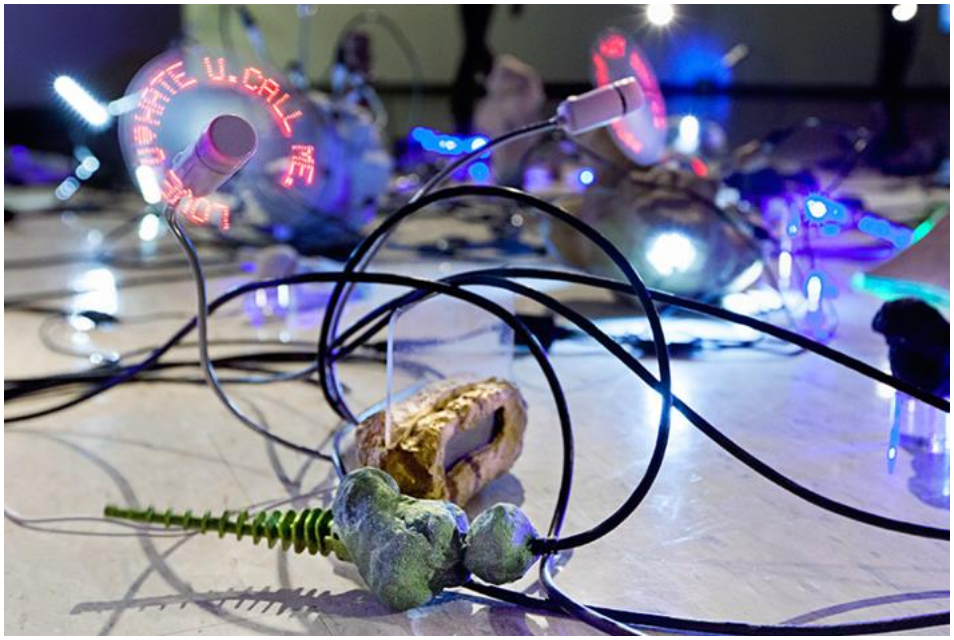

Figure 17. Behar, *Katherine Behar: E-Waste*, 2014, Tuska Center for Contemporary Art, unnamed prologue to the exhibition

The prologue of the exhibition sounds as if it is an excerpt from a science fiction story that depicts an apocalyptic world. In this speculated future, electronic waste has fossilized and become one with the earth once again. Yet, electronic devices that were created for the purpose of something else such as USB fans are bereaved of that purpose. Instead, these electronics are forced to work indefinitely. In some future speculations it can be observed that technological advancements are what save the life of humans on the earth. But Chatonsky and Behar both depict a dystopic future in which globalization and mass consumption cause the end of humankind. Both artists state that it is their intention to provoke some kind of sensation in viewer. They aim at awakening the consumer, to make the consumer conscious of the processes technologies undergo before and after they reach their temporary users.

In the end "computers are a crystallization of past two hundred to three hundred years of scientific and technological development, geological insight, and geophysical affordances" and these affordances are what Behar is particularly emphasizing (Parikka, 2015, p. 137). She reminds the audience that the earth provides all the required materials and energy for electronic devices to work. In this scenario, the devices find a way to attract the required energy to function and as a result they come alive. They portray zombie media in a concrete sense. Electronic devices are often upgraded because they slow down or no longer support new software, thus when the device is discarded it still functions. Behar emphasizes this aspect of e-waste as the electronic objects portrayed in her exhibition all come alive and function. The return to life of these electronic devices is what makes them zombies.

In *Katherine Behar: E-Waste*, the fossilized USB fan states "love u, hate u, call me," yet this text only appears when the fan is functioning. It is my contention that this

exemplifies the relationship between *bios* and *zoe* as humankind tries to dominate nature yet at the same times fears its wrath. It is a love hate relationship. When discussing the artworks presented in this study, the disruption of an ecological equilibrium is inevitably mentioned. Swyngedouw (2011, p. 72) describes this push and pull with nature as follows:

> It is the sort of fantasy displayed in calls for restoring a true (original but presumably presently lost) humane harmony by retro-fitting the world to ecological balance and in the longing for a Nature that functions as the big "Other", the one that suggests the pathway to redeem our predicament. Here, Nature is invoked as the "external" terrain that offers the promise, if attended to properly, for finding a truly harmonious life, but also from which threat of disaster emanates if we perturb its internal functioning.

He mentions that nature has become a fantasy in the minds of humans as a result of globalization. Therefore, it is not really known what is at cost. The ecological equilibrium that needs to be re-balanced is not a balance of natural order but rather an imagined reality. It is in this manner that becoming is especially crucial because becoming-other, becoming-mineral, becoming-nomad expand the perspective of the subject to perceive what nature really is. Behar's exhibition shines light on the geological aspect of media and its connection to nature. Braidotti argues that becoming-nomad ultimately decenters the human and vouches for the triumph of *zoe* (2001). The chemical elements in the fossilized electronic devices are thus decentering the human in favor for the triumph of *zoe*.

To conclude, both Chatonsky and Behar tap into the nostalgic feelings as well as the adoration that humans feel toward their technological gadgets. According to Braidotti a nomadic subject will feel "a sense of responsibility and ethical accountability for the environments she or he inhabits" (2006a, p. 137). Their exhibitions exemplified in this section speculates a dystopic future in order to arouse a sense of responsibility in the consumer. It can be said that the works by these artists have the potential to

trigger a nomadic-becoming in its viewer and as a result trigger a more responsible manner of consumption of electronics.

3.5 Conclusion

The political, philosophical and environmental critique of each artworks presented in this chapter have the power to affect its viewer. Cohen and van Balen create the political and ethical argument on the fluidity of value in the case of raw earth elements. They point out the paradox of what is considered waste and what is not; they establish an argument for the sake of the other: the laborer and the rare earth elements. Further, Jordan captures the junkscapes that are the result of a consumer-oriented society. Jordan's photographs are invaluable because they represent a side to mass consumption that is often neglected. *Intolerable Beauty* presses on the urgency of the cumulation of waste. Lastly, by speculating a dystopic future in which humans are extinct, Chatonsky and Behar emphasize the pointlessness of electronics without human interference. The following chapter focuses on the commercialization of electronic waste through artistic endeavors. The artists utilize electronic scraps and find a way to change the value of what is considered to be waste.

CHAPTER 4

WASTE AND VALUE: COMMERCIAL PRODUCTS MADE FROM E-WASTE

4.1 Introduction

In this chapter the focus is on artistic practices that use e-waste to create a commercial consumer product. By engaging in these practices, the artists use electronic waste as a raw resource that they can mold into desired form. Through disfiguring and re-figuring the obsolete media, the artists prove that the upcycled products can be sold for monetary value once again. The monetary value ascribed to the finished work of art is in this instance quite high. This could perhaps be a foreshadowing of the use of electronic waste as a raw resource, rather than thinking of it as garbage. Upcycling electronics proposes a possible creation of new raw resource namely, obsolete media.

Through the practice of upcycling media, electronic pieces are distorted and thus their initial purpose is changed to something else. For example, the intention behind the creation of a communication device like a mobile phone is to connect humans across the globe. Yet by re-using electronic waste for the purpose of something else like art, eliminates this intention. Artworks presented in this chapter use electronics in a way that distorts this original purpose by creating a consumer product that heavily relies on aesthetic beauty rather than functionality. The aim of this chapter is

to explore the fluidity of value attributed to rare earth elements in electronic waste. It is my contention that the artists presented in this chapter create innovative solutions to the rapidly growing e-waste problem. Thus, the works of art in this chapter engage in the precarious categorization of electronics as waste.

The artworks of the following artists are presented in this chapter: Yuma Fujimaki, Hiroto Ikeuchi, Gabriel Dishaw and Mounou Desire Koffi. The first two artists Fujimaki and Ikeuchi create wearable accessories out of electronic waste. However, the type of accessories they create differ slightly. Fujimaki makes elegant and even luxurious necklaces, rings and broches out of obsolete communication technologies. On the other hand, Ikeuchi uses e-waste to create wearable devices that look as if they belong in science fiction, particularly in a cyberpunk setting. Fujimaki's jewelry therefore, is more fit for day to day use whereas the products Ikeuchi creates are aimed more at a niche. Dishaw and Koffi create decorative accessories out of e-waste. These decorations differ in size, style and type. Dishaw creates sculptures inspired by popular culture whereas Koffi uses obsolete media that he collects from his native country Ivory Coast to create mixed media portraits on large wooden boards.

4.2 The Fluidity of Electronic Waste

The rare earth elements that create the composition of electronic devices are often considered to be valuable. Value proves to be quite fluid in meaning. It is vital to question according to whom and why something is considered valuable. In the case of rare earth elements, their value depends on the amount that exists naturally as well as the difficulty of retrieving it. Depending on how easy it is to retrieve the raw materials—little effort and cost—the less valuable it is. The value of these chemical

elements also varies on how much processing they require to be functional as well as their specific qualifications such as durability.

If discarded electronics have the endurance to be manipulated multiple times why are they considered to be of no value? Value is a fabricated measurement which is determined by a market that is profit driven. The categorization of valuable metals is according to the cost of retracting the raw material and its required processing to get it to the desired state of use. Hence, the market is driven by calculations that consider multiple factors and come up with a value that is extremely fluid and thus changes constantly. These calculations determine that it is much cheaper for manufacturers to mine new resources than to recycle used electronic equipment. This means that a valuable element such as gold can become worthless over time; for example, the gold in electronics are considered of little value and thus not worthy of recycling. Accepting that the market is profit driven and is not heavily concerned with its impact on the environment, the cumulation of electronic waste is not a surprise.

Nomadic philosophy creates the foundation of Braidotti's argument for a sustainable future. How does nomadic becomings play a role in understanding the fluidity of waste then? According to Braidotti, there is a number of manners in which sustainability can be measured. The most crucial way is to test the endurance of the subject or object. Endurance entails the capacity of external forces the subject or object can take (Braidotti, 2006b). Pain, pleasure, or decay can be an example for external forces. The endurance of electronic devices is measured through their resistance to decay. The devices resist external forces such as moisture, air, bacteria etc. Electronic waste does not decay like organic waste instead it endures the forces of nature. This complication leads back to the issue of a profit driven market that does not consider the environmental aspects as a crucial factor. Instead,

manufacturing strategies such as planned obsolescence play a key role in why functioning electronic devices are discarded. However, it is important to note that this is not the only reason but rather a crucial factor. Consequently, the metals in electronic waste represent a collection of nomadic entities. United in the form of electronic devices, the metals resist the natural order of organic decay. The sustainability of these metals questions the categorization of electronics as waste. Through this perspective the flexibility in value attributed to electronic waste is analyzed.

Figure 18. Dishaw, *Fembot*, 2011, copper, adding machine parts, typewriter parts, computer mother boards, fuses, airplane parts, wire and meters

Gabriel Dishaw is an American artist who "specializes in high end junk sculptures ranging from as small as a figurine to larger than six feet tall" (Dishaw, n.d.). Dishaw states that his "mission is to create dialogue and help find creative, environmentally sound ways of re-purposing e-waste" (Dishaw, 2019). He uses new and old obsolete media; this creates a snap shot on how rapidly technology advances. New media devices replace old devices extremely fast. This is not because the devices we use are

broken or no longer functioning, but rather have to do with the psychological and sociological impact advertising has on individuals. The juxtaposition of the old and new also inherently alters the temporality of the electronics. As the media devices refuse to rot or decay in time, this aspect of dead media exemplifies "the temporalities in which machines themselves are embedded and which they impose on the human social world" (Parikka, 2015, p. 7).

Figure 19. Dishaw, *Clone Fembot*, 2013, 44 computer keyboards copper, adding machine parts, typewriter parts, computer mother boards, fuses, airplane parts, wire and meters

Dishaw states that he is "constantly looking for new ways to use old materials" by "showcasing them in a new light" (2019). The gap between old and new technology has become blurred due to increase in consumption. In Dishaw's sculptures *Fembot* and *Clone Fembot,* different parts of electronics are used in the creation of the

sculptures. Dishaw has repurposed electronics and refigured these scrap parts to his liking. Instead of outer design, the actual geophysical aspect of media is brought out into the open. This is the part of media that is resilient, and can be disfigured and refigured however it is desired.

Figure 20. Dishaw, *Apple Vader*, 2015, Mac G4, data cables, USB cords, mice, RAM, heat sinks, wire and other materials, 12.5x18x10.5

On a different note, the sculpture *Apple Vader* by Dishaw is created from the computer Mac G4, in this case the artist has included the outer design of the computer to create a work of art. In *Apple Vader* although the outer design of Mac G4 is difficult to disfigure to the liking of the artist, Dishaw does find a way to incorporate this type of scrap e-waste in his sculptures.

Electronic devices are manufactured in a specific way to fit the requirements of its consumer. A mobile phone is designed and crafted to function as a communication device. Each electronic device has its own functionality and productivity. The devices are especially designed in a manner that is aimed for communication. In *Clone Fembot* the head of the female sculpture is made up of a keyboard. In this

instance the keyboard is no longer used as a form of tool for writing. It serves a different purpose such as that of aesthetic value.

Becoming exists of multiple paths taken simultaneously. Some paths of becoming create a group. Becoming-nomad exists of individuals entities that unite for the goal of sustainability. Nomadic philosophy promotes a bio-egalitarian future—in which sustainability is the ultimate goal—then nomadic subjects undoubtedly form a group. It is difficult to take large steps toward sustainability if activist actions stay solely singular. Braidotti (2006a, p. 94) shines light to this issue by stating that:

> Nomadic subjects are not quantitative pluralities, but rather qualitative multiplicities. The former is merely a multiple of one—multiplied across an extended space. This is the political economy of global capitalism as a system that generates differences for the purpose of commodifying them. Qualitative multiplicities, however, pertain to an altogether different logic. They express changes not of scale, but of intensity, force, or *potentia* (positive power of expression), which trace patterns of becoming.

The sculptural bodies created by Dishaw become nomadic subjects that represent the qualitative multiplicities. Each chemical element in the electronic device is in relation with the elements in the device as well as the other chemical elements that make up the sculpture. Their impact on a societal consumption is not in scale but rather in intensity. This intensity is parallel to their endurance because the sculptures exists out of durable materials that are considered as waste. These sculptures are used as decorations in a variety of locations scattered globally. They represent the trash culture that is the byproduct of modernity.

4.3 Wearing E-Waste

This section takes a closer look at the artworks by Yuma Fujimaki and Hiroto Ikeuchi. Fujimaki is a Japanese jeweler and designer who explores innovative ways in designing jewelry. He creates a variety of jewelry made entirely out of obsolete electronic parts. His approach to electronic waste exemplifies a new perspective in

the classification of electronics as waste. Ikeuchi is also a Japanese artist but he creates Cyberpunk-themed accessories made from electronic waste. Unlike Fujimaki's approach, Ikeuchi paints over the devices to make them look brand new. Had Fujimaki not stated it was made from e-waste, it might have been difficult to understand. Both artists create a statement through their preferences in choosing discarded electronics as their medium, and by doing so they attribute value to something that is considered trash.

Figure 21. Fujimaki, *Green & Gold Circuit Necklace*, 2010, PC Circuit, Au750, Cord, 30×45×14

Fujimaki and Ikeuchi in this sense allow for the metals in electronic waste to continue a nomadic path. The electronic device can be considered as an assemblage, through this practice allows for new assemblages to construct. As Deleuze and Guattari state, "there are only multiplicities of multiplicities forming a single assemblage, operating in the same assemblage: packs in masses and masses in packs" (1980/1987, p. 34). I argue that by choosing electronic waste as their preferred

source the artists allow the multiplicities that create electronic devices to merge and unite. By combining different parts from various electronic devices, the artwork becomes a unique assemblage. In a way these accessories made from electronic waste reflect on consumerism and promote responsibility. The conscious responsibility is a vital factor of nomadic ethics and is explained by Braidotti as "a thin barrier against the possibility of extinction", a way of "actualizing sustainable forms of transformation" (2006a, p. 217).

Fujimaki creates a variety of accessories. For example, he creates rings from PC circuits. In *Memory Chips Ring* (2009) Fujimaki uses black boxes from a PC circuit to create a ring. In *Black & Gold Circuit Ring* (2009) and *Green & Gold Circuit Necklace* (2010) he uses gold from a PC circuit to create a golden ring and necklace. The jewelry resembles an electronic component and, in a way, represents the hybridity of the jewelry that exists both of natural and machinic elements. The *Black & Gold Circuit Ring* for example imitates the traditional ring through its use of gold, this is the natural aspect. The machinic aspect exists of the other metal components as well as its reason for creation that is solely because of its use as a circuit.

The jewelry created by Fujimaki also exemplifies the rhizomatic formation of the e-waste used. "A rhizome is made of plateaus" and plateaus are "any multiplicity connected to other multiplicities by superficial underground stems in such a way as to form or extend a rhizome" (Deleuze & Guattari, 1980/1987, pp. 21-22). As mentioned earlier, the accessories made from e-waste unite in forms of multiplicities. Allowing these elements to form or expand their rhizomes the metals in Fujimaki's jewelry represent the becoming-imperceptible of e-waste. According to Deleuze and Guattari "the imperceptible is the immanent end of becoming, its cosmic formula" (1980/1987, p. 279). Through its use in jewelry, electronic waste stands for the

creation of a novel raw resource. In this way, e-waste has become connected to the earth and soil again. The earth represents the ultimate resource and therefore the electronic waste in the jewelry symbolizes the becoming-imperceptible of rare earth elements. The chemical elements have been through many intensities such as mining processes, changes in purposes and value but eventually returned to the soil and thus to the earth. In this manner, becoming-imperceptible represent the unification of e-waste with its environment.

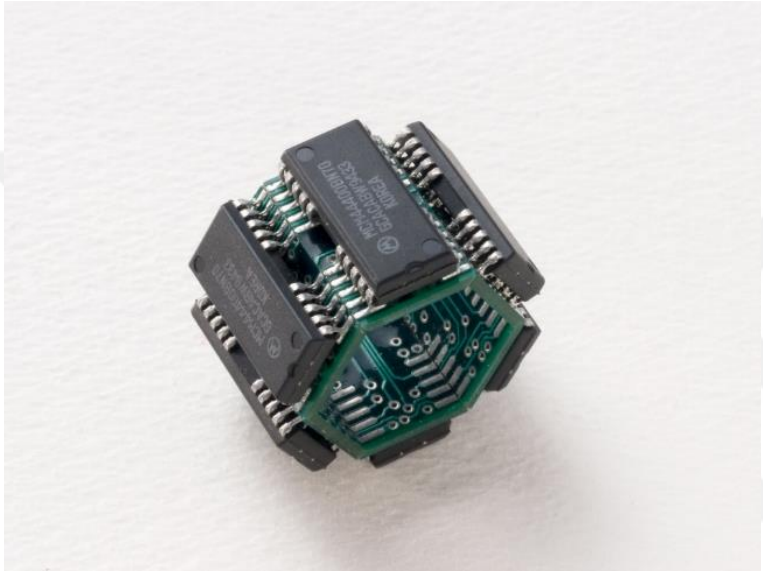

Figure 22. Fujimaki, *Memory Chips Ring*, 2009, PC Circuit, 25×25×18

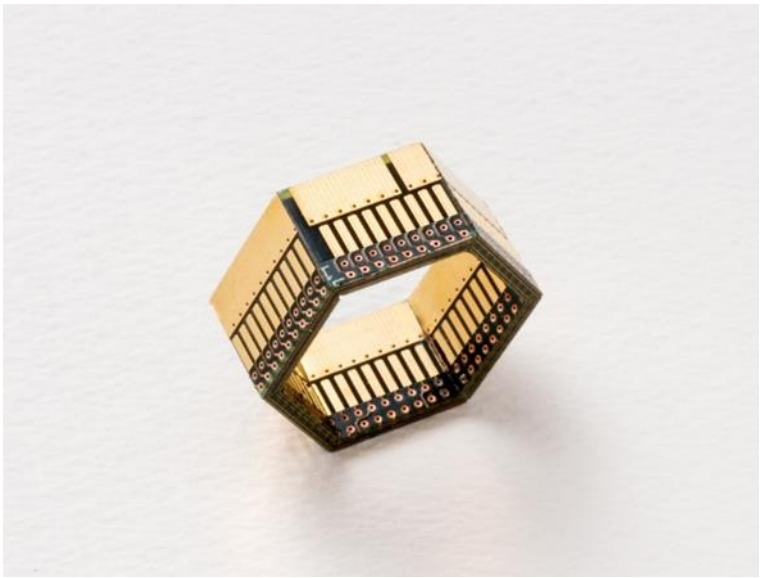

Figure 23. Fujimaki, *Black & Gold Circuit Ring*, 2009, PC Circuit, 25×25×16

In a similar tone to my argument on the artworks of Cohen and van Balen the precious elements present in electronics are considered valuable and at the same time are considered merely as waste. The rare earth elements in electronic waste are thus "materially embedded subjects in-process circulating nomadically within webs of relation with forces, entities, and encounters" (Braidotti, 2016, p. 383). I argue that through such webs electronic waste has a profound influence on its surroundings including, the electronic devices surrounding itself as well as the bacteria and fungi in the soil and air and humans. The influence in the case of Fujimaki's jewelry exceeds the person using it as an accessory. The pieces of jewelry exist as a forthcoming nomadic entity. It is engaged with its environment by symbolizing the waste of technology. Fujimaki crafts a "simple pendant" that was created from recycled PC circuits; although it is described as simple, the necklace is quite complex as it is historically entangled with the deep times of the earth as well as the cumulation of human intelligence in technology. (Mok, 2011). Fujimaki emphasizes the notion that electronics are made of off the earth and that these rare earth elements are extremely durable, therefore they can be disfigured and refigured.

In a way, Fujimaki uses obsolete electronics as a raw resource such as clay. He accepts electronic waste as a novel raw resource that can be disfigured and refigured and attributed monetary value. Fujimaki does not disfigure the electronic component too much, it is still obvious that it is an electronic component. The jewelry continuous to resemble an electronic component in this way it also represents the assemblages that derive from electronics. Instead of polishing the jewelry Fujimaki allows for the raw resource to stay natural in form. Natural in this sense refers to the state in which Fujimaki accepts electronic waste. In order to utilize e-waste as raw resource the state in which it is discarded is accepted as natural. Instead of retracting

the metals from obsolete electronics and refiguring it through extreme processes the artist embraces the form in which the resource is.

As said earlier, electronic waste consists of many heterogonous assemblages. These assemblages make up the device and make it a functioning electronic. These assemblages are not disrupted in the process of jewelry making in the works of Fujimaki, as “assemblages enable us to envisage the way that entities different in kind participate together, giving rise to reality as such” (Roffe & Stark, 2015, p. 11). The *Memory Chips Ring* for example represents multiplicities that have grouped to form a rhizome. Before *Memory Chips Ring* the PC circuit component in the ring belonged to the rhizomatic formation of the circuit. In this way, Fujimaki’s approach to e-waste breaks and creates rhizomes. By utilizing e-waste to create jewelry Fujimaki redefined the PC circuit differently than its original reason of production. In this manner the jewelry is becoming-nomad with the promise of sustainability. This promise comes from the creative reuse and redefinition of e-waste in the jewelry.

4.4 Imagining Future Technologies

Ikeuchi creates wearable accessories from electronic waste. Unlike Fujimaki he creates larger pieces of accessories and polishes the finished product to look like brand new technological gadgets. This means that Ikeuchi’s artworks do not always show its source as e-waste. In this manner the accessories that Ikeuchi creates represent e-waste as an amalgamation of natural resources that have come to exist through ages of environmental changes and the cumulation of human intelligence in the hands of human evolution. The natural machinic formation of e-waste derives from human intensities such as mining, refining and processing. The machinic aspect of e-waste comes from its production as technological elements. The rare earth

elements go through many processes but endure intensities that inflict change on its *self* as rare earth elements.

Unlike Fujimaki, Ikeuchi creates accessories that are not intended for daily use. His niche is geared toward a group that favors science fiction and hi-tech futures such as cyberpunk. Ikeuchi uses "the human power of imagination to overcome the human" by redefining and re-assembling obsolete electronics (Colebrook, 2002, p. 129). In a creative manner Ikeuchi de-centers the human by engaging in sustainable alternatives for the problem of e-waste. In figure 25, an untitled headpiece created by Ikeuchi exists as an amalgamation of various electronic components. The use of dated electronic devices speaks for the array of obsolete media used.

When all Ikeuchi's works are analyzed it can be seen that the objects are created from several types of electronics including hardware and circuits. By bringing together different obsolete media parts Ikeuchi envisions technological devices that augment the human body. Grosz argues that Deleuze focuses on the following question: "what forces run through humans to connect them to animals and plants, to incipient brains, to milieus and atmospheres, to geographical and historical events—that is, what forces make the human exceed itself?" (2015, pp. 18-19). Humans believe that through science and technology they can become superior to nature. At the same time, they are dependent on elements that exist in nature to make technology work. Therefore, humans are necessarily tied to their mortal reality. Tied to the environmental fluidities this connection creates space for becoming-other, -animal, -waste and the like. *Pulse Launcher Unit* (2016) envisions a future of human machine entanglement. This future can only be plausible if the environmental equilibrium exists. The double meaning behind *Pulse Launcher Unit* symbolizes the

becoming-nomad of the multiplicities of chemical elements. In this way the artwork itself communicates with the person.

As mentioned before, electronics already represent the amalgamation of natural and machinic components Ikeuchi includes the human body into this entanglement. In this way, "the human becomes more than itself", but "not by affirming its humanity" but rather "becoming-hybrid with what is not itself" (Colebrook, 2002, p. 129). Ikeuchi's futuristic accessories symbolize a future that cannot co-exist in a world full of e-waste. The untitled headset in figure 27 represents the entanglement of human and machine. This amalgamation also represents the in-betweenness of the subject. The representation of the machinic devices entangled with the human body represent the becoming-other-than-human that is "'in-between' human and machine, organic and inorganic, biological and technological, natural and unnatural, real and artificial, fact and fiction, reality and fantasy, power and desire" (Sotirin, 2005, p. 101).

In conclusion Ikeuchi creates accessories that represent the ambiguous future and its relation to electronic waste. The artist engages in creative manners to represent his idea towards sustainability in technology. Colebrook argues that "we should not seek to uncover what a philosophy or text means" but rather "at what the philosophy does, or how it transforms the problems that in turn transform our thinking" (2002, p. 64). In this sense electronic waste as futuristic devices connects the desire for high technology future to the importance of environmental sustainability.

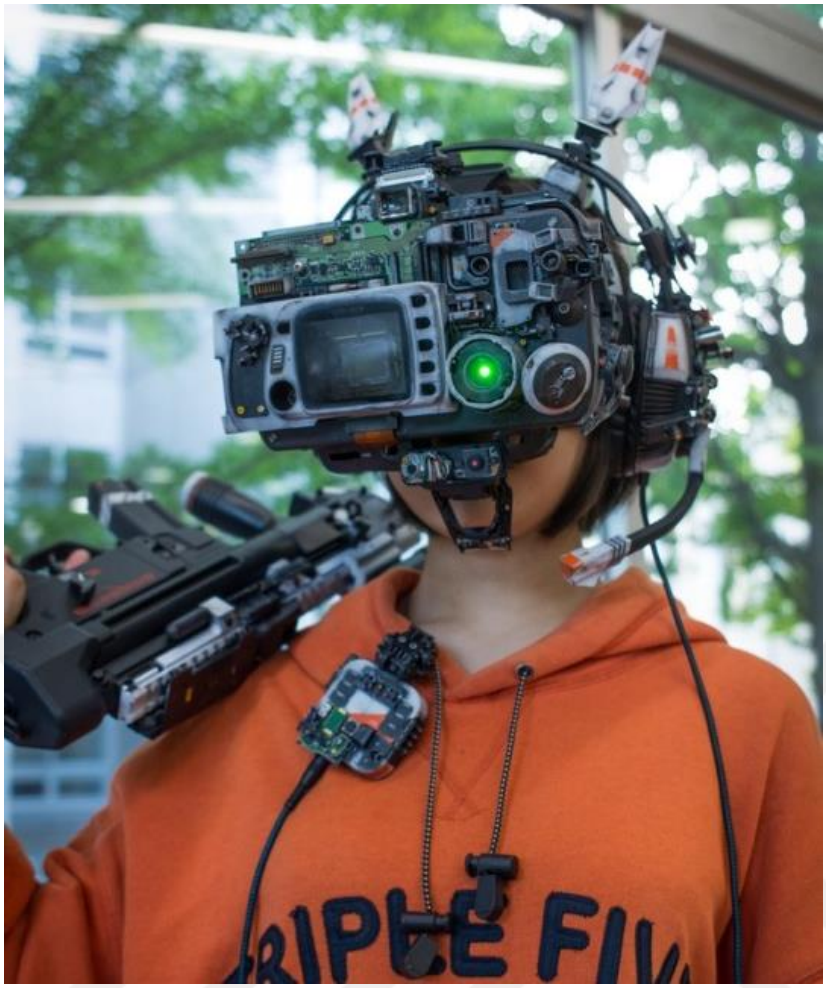

Figure 24.Ikeuchi, no title, n.d.

Figure 25. Ikeuchi, no title, n.d.

Figure 26. Ikeuchi, *Pulse Launcher Unit*, 2016

4.5 From Communication Technologies to Socially Embedded Decorations

Similar to Dishaw, Ikeuchi and Fujimaki, Ivory Coast artist Monou Desire Koffi uses electronic waste as a medium for his artwork. His use of electronics in an innovative way raises awareness to the issue of e-waste in his native country. Placed in the West African coast, Ivory Coast is a small country where electronic waste is sent and collected. The regulations of the country concerning e-waste are non-existent. This lack of control over e-waste landfills allows for hazardous recycling practices that negatively affect the health of the laborer as well as the environment. Koffi uses old mobile phone keyboards to create large tableaus that represent daily scenes of Ivory Coast habitants. He "dismantles the phones with a hammer to pull out the screens and keyboards" in order to use them in his artworks (Coulibaly, 2018). The tableaus made by Koffi are reflect on the colorful culture of Ivory Coast through juxtaposing its problematic issue with electronic waste. In the tableau *La Récréation* (2018) Koffi portrays a cultural event in which two people are dancing in a circle of people. The two people presented in the tableau are created entirely out of mobile phone keyboards. Observed closely, the tableau uses various keyboards and each keyboard represents one mobile phone. Electronic waste in Ivory Coast stands for both the deteriorating health of both the recyclers and the environment. The recycling practices on electronic waste landfills use unsafe methods that use fire. Burning electronics causes air pollution and leaks toxicity to the soil. Koffi's work juxtapose the colorful Ivory Coast culture with the deteriorating effects of electronic waste on its environmental future. Parikka argues that medianatures "crystallizes the 'double bind' of media and nature as coconstituting spheres, where the ties are intensively connected in material nonhuman realities as much as in relations of power, economy,

and work" (2015, p. 14). Thus, medianatures can be observed under "extreme contexts of exploitation and environmental damage" such as "electronic waste, resource depletion, and globally unevenly distributed relations of labor" (Parikka, 2015, p. 14). The medianatures of Ivory Coast are visualized in the tableaus by Koffi as the artworks represent a culture that is entangled with electronic waste in a political, sociological and environmental sense.

Figure 27. Koffi, *Aya's Scream*, 2018, phone keyboards and acrylic on jean fabric, on chassis, 80 x 80

Guattari argues that environmental equilibrium can be obtained "not only through nature" but by including "subjectivity and social relations" (Parikka, 2015, p. 91). This shows that in order to strive for a sustainable future, the societal impact of electronic waste also is an important factor. Landfills dedicated to electronic waste, such as the ones in Ivory Coast, often have people recycling under hazardous conditions. These conditions inflict health detriment for both the recycler as well as the earth. Allowing the citizens of Ivory Coast to work under such hazardous

conditions is not only the responsibility of the country's government. The electronic waste that is transported to the African country is collected from Western countries. This mirrors an ineffective waste management strategy and demonstrates the becoming-other of e-waste, recycler and the earth. Indirectly the consumers in developed countries play a role in the deterioration of the environment. In this manner these practices exemplify how the laborer as well as the environment and rare earth elements are categorized as the 'other'. In the end "nature affords and bears the weight of media culture, from metals and minerals to its waste load" (Parikka, 2015, p. viii).

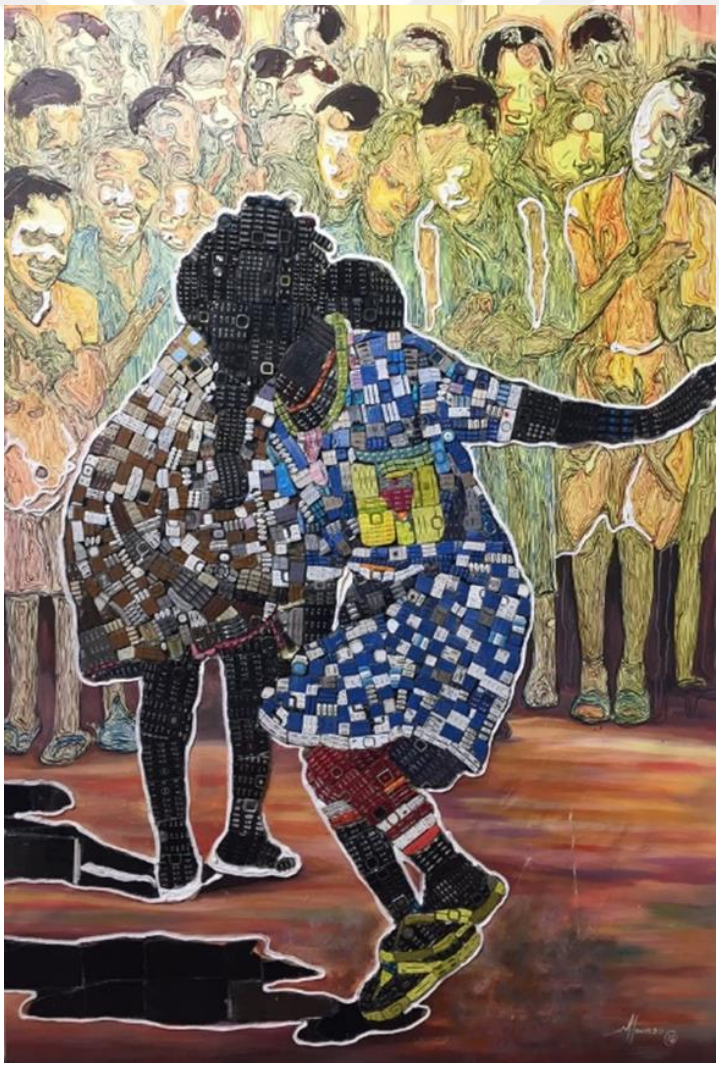

Figure 28. Koffi, *La Récréation*, 2018, Phone keyboards and acrylic on jean fabric, on chassis, 129 x 88

Koffi uses mobile phone keyboard to create part of his work, although his works are created in recent years the obsolete media he uses are outdated. These mobile phone devices have almost become naturally obsolete through practicality and innovation of touch screens. The tableaus make use of various types of keyboards. This represents the vast array of obsolete media in Ivory Coast. According to Braidotti, sustainability "attempts to come to terms with the complex, hybrid structure of contemporary social problems" (2006a, p. 207). The hybridity of the issue stems from its transdisciplinary political sphere. The issues regarding the environmental crisis are interconnected with issues such as advanced capitalism, globalization and rapid technological developments. "In fact art is not politics in the typical—or molar and signifying—sense" (O'Sullivan, 2010, p. 193). Rather, it "comes from this play with matter and with this production of difference" (O'Sullivan, 2010, p. 193). The difference here alters the temporalities of electronic devices, by slowing down their loss in value. In *Aya's Scream* (2018) Koffi uses old mobile phone keyboards to create the portrait of Aya. The child's entire portrait is created from obsolete media. This symbolizes that electronic waste has become tangled with the human body. The effect of e-waste can be seen in the culture, in the clothing, in the health of the human body.

Nomadic ethics actively propels forms of becoming that is "based on the shared capacity of humans to feel empathy for, develop affinity with and hence enter in relation with other forces, entities, beings, waves of intensity" (Braidotti, 2006a, p. 217). Together with altered temporality of electronic waste, the value of these materials can be heightened by a nostalgic affection toward the obsolete devices. This will induce the emotion of care for what makes technologies possible: nature. In this manner, Koffi's use of obsolete media triggers multiple becomings to set forth.

These becomings include both human and non-human entities that de-center the human in favor of *zoe*, which stands for a bio-egalitarian balance. By viewing technologies from this perspective allows for an understanding of the "relationship of technology and nature, but in a strange 'environmentalism'" manner (Zepke, 2009, p. 209).

4.6 Conclusion

In conclusion, this chapter ultimately explores innovative ideas that use electronic waste. It is my contention that this chapter has a unique place in this thesis, because this chapter focuses on commercial products made out of e-waste, highlighting a totally different aspect of the issue. It shines light on the impact electronic waste has on a cultural, environmental and societal level. The artists represented in this chapter utilized electronic waste as a resource. In this way the commercial products reconstruct their value. This practice rethinks waste materials attributes them new meaning. Thus, instead of representing the 'brain' of an electronic device, a circuit board becomes a fashion accessory like a ring. Thus, instead of representing the 'brain' of an electronic device, the circuit board becomes a fashion accessory like Fujimaki's PC circuit rings. Thus, Fujimaki, Ikeuchi, Dishaw and Koffi use electronic waste as a raw resource.

CHAPTER 5

TINKERING METHODOLOGIES, DIY CULTURE

5.1 Introduction

This chapter focuses on practices that use methodologies that can be practiced by any individual. Such practices are concerned with DIY culture which stands for Do-It-Yourself. This culture emerged from the need or desire to fix a broken technological device. The current movement ‘Right to Repair’ is a good example that fits into the DIY culture. This movement emerged from restrictions on hardware made by Apple that made it difficult for the consumer to repair, tinker, re-use or break. DIY culture includes various methodologies such as circuit-bending, tinkering and hacking. DIY methodologies “often traverses through the hidden content inside of a technological system for the joy of entering its concealed underlayer, often breaking apart and reverse-engineering the device without formal expertise, manuals or defined endpoint” (Hertz & Parikka, 2012, p. 426). Conceptually, such “techniques can be related to nomadic, minor practices in the manner outlined by Deleuze and Guattari”, because they break the invisible wall between the consumer, electronic device and manufacturer (Hertz & Parikka, 2012, p. 426). This chapter focuses on artists that use e-waste to create artworks with functioning devices. The Korean-American artist Nam June Paik started creating artworks from functioning televisions in the 1970s. His works are considered to be ahead of its time and heavily influential in media art.

His work is categorized more as video art. The artworks presented in this chapter are from artists Reed Ghazala, Walter Giers and Benjamin Gaulon.

Media devices become rather quickly obsolete because of the business model planned obsolescence. This business model is aimed at "artificially decreasing the lifespan of consumer commodities" by increasing the "speed of obsolescence" which then "stimulates the need to purchase" (Hertz & Parikka, 2012, p. 425). This business strategy creates what Parikka and Hertz call zombie media by which they mean "dead media revitalized, brought back to use, reworked" (2012, p. 425). Therefore, any work of art that repurposes electronic waste essentially creates zombie media. The emphasis of zombie media is especially on the fact that electronic devices are discarded prematurely. Hertz states that according to the "Environmental Protection Agency (EPA) two-thirds of all discarded consumer electronics still work" (2012, p. 174). This inevitably results in landfills full of working electronics. This illustrates the afterlife of e-waste as "dead media creeps back as dangerous toxins into the soil, or alternatively as zombie media recycled into new assemblies" (Hertz & Parikka, 2012, p. 429).

Media materialism in classical media theory refers to "the necessity to analyze media technologies as something that are irreducible to what we think of them or even how we use them" (Parikka, 2015, p. 1). It is concerned with the political, economic and most importantly the sociological impact of media devices. Instead, Parikka suggest that there is another level to media materialism that "focuses solely on machines or even networks of technologies as nonhuman agencies" (2015, p. 3). Parikka argues that media materialism should include the geophysical aspect of media. In this manner, his approach is heavily concerned with the environmental and social impact of the use of media devices.

5.2 What is Circuit-Bending?

Circuit-bending is the practice of manually changing the wires of a technological device. Often this practice uses electronic devices such as radios, children's toys and similar simple devices. It is a practice that promotes the understanding of what compromises a device, and how it functions. American artist Reed Ghazala is widely considered to be a "pivotal figure in the development of what is termed 'circuit bending'" (Hertz & Parikka, Zombie media: Circuit-bending media archeology into an art method, 2012, p. 426). Ghazala started his circuit bending process by accident during his freshman year in high school (Ghazala, Circuit-bending: Build your own alien instrument, 2005). Since then, he has created an art methodology out of this re-wiring processes.

Circuit-bending is a practice that does not require an extensive understanding of electronics. Re-wiring simple technologies is only a matter of curiosity and practice. As Ghazala himself states "the beauty of circuit-bending" is that "anyone can do it" (2005, p. 3). The practice itself is a way of exploring and learning the mystery of the innerworkings of electronics. Hertz states that tinkering methodologies in general are for the "sake of exploring and unraveling the 'black boxed' technological layer of the device that is usually concealed" (2012, p. 174). By meddling with the electronic device, the consumer redefines the device by using it other than it was intended by the manufacturer. The black box no longer becomes a mysterious component but rather a tool to create artistic work. Hertz describes circuit-bending as "reverse engineering without any formal expertise" (2012, p. 177).

5.2.1 Alien Instruments: Unique Sounds

The art of circuit-bending lies in its unique production of sound. Therefore, when thinking of circuit-bending one has to think of "the creative short-circuiting of consumer electronics primarily for the purpose of generating novel sound or visual output" (Hertz, 2012, p. 176). Depending on the complexity of the circuit, the sound will change and become more complex. Ghazala states that as "technology produced more and more complex sound circuits", his collection of circuit-bend orchestra expanded (2005, p. 11). Circuit-bending is simply the re-wirings of different circuits. Each electronics device, whether it is a mobile phone or children's toy, has a circuit. On his official website, Ghazala (anti-theory.com, n.d.) has a section on 'how to circuit-bend' where he explains why the result of bending is an alien device:

> The circuit-bent instrument, often a re-wired audio toy or game, is an alien instrument: alien in electronic design, alien in voice, alien in musician interface. Through this procedure, all around our planet, a new musical vocabulary is being discovered. A new instrumentarium is being born.

In his book *Circuit-Bending: Build Your Own Alien Instrument* (2005) Ghazala writes a manual on how to circuit-bend and its unique relationship with electronics. The reason he describes circuit-bending as creating alien devices is because the results of this method produces unique sounds. Circuit-bending is the "process of creating experimental musical instruments from pre-existing audio

circuitry" and even a small adjustment in wiring can alter the unique sound output.

Ghazala's alien device depicted in *Incantor 3* uses the Speak & Math gadget that was a "popular and revolutionary electronic toy created by Texas Instruments in 1980" (Wikipedia, 2016). The toy's original purpose is to teach children math. The device uses a chip for voice synthesis as it is an interactive toy. Hertz and Parikka state that "Ghazala's *Incantor* is useful as a tool to remind us of sociotechnical issues in

contemporary society, including planned obsolescence, the black boxing of technology and the interior inaccessibility of everyday consumer products" (2012, p. 426). Further, it can be seen that the Speak & Math gadget is in bad shape, but in order to circuit-bend the innerworkings of the device need to be functioning. The case can be replaced by something else.

Figure 29. Ghazala, *Incantor 3*, n.d, circuit-bent Speak & Math

Why is circuit-bending important? Instead of solely debating the issues of electronic waste, art methodologies such as circuit-bending highlight the potential of electronic parts. This practice promotes the idea that, although the gadget itself has become outdated and obsolete, the innerworkings of the device are made up of sturdy material that still yield the potential to function. Therefore, in this instance electronic waste becomes a new object that produces novel and unheard-of sounds. Circuit-bending as a practice then, allows for the consumer to engage in manipulating a device out of its manufactured borders. The regular consumer sees the electronic device as "only an object with a particular input that results in a specific output" the

"mechanism is invisible" (Hertz & Parikka, 2012, p. 428). The Speak & Math device of the 80s becomes a musical instrument in a new era. In his book Ghazala points out the necessary steps to circuit-bending. One of the final steps is to create a project box. This means that once the circuits have been altered with and the desired result have been achieved, the object is placed into its case. According to Ghazala the "best cases open easily for battery access, are nonflexible (sturdy), and have a little more room than you think you'll need" (2005, p. 154). Therefore, the cases of the electronics are not necessarily all that make up the circuit-bend instrument. In the case of *Soundpoem Tank,* Ghazala has blended the original device/case with additions that he saw fit. This indicates that circuit-bending is more than merely changing the wires of the circuits, but rather proves to be a unique experience to become part of the electronic device.

*Figure 30.*Ghazala, *Soundpoem Tank,* n.d

The practice of circuit-bending is in essence a betrayal of consumer/machine territories. The manufacturer does not intend for the consumer to break into the device and tinker with it. Since the rise of DIY culture—and in relation circuit-bending and tinkering—manufacturers are more likely to create black boxes that are difficult to open because "from a design perspective, the technology is intentionally created to render the mechanism invisible and usable as a single, punctualized object" (Hertz & Parikka, 2012, p. 428). Opening the device often equals breaking the device. "In other words, technological objects are designed as a 'black box'—not engineered to be fixable and with no user-serviceable parts inside" (Hertz & Parikka, 2012, p. 426). This practice therefore, is in line with the Deleuzian-Guattarian view of deterritorialization. The person that uses the method of circuit-bending deterritorializes the electronic device. At the same time circuit-bending often uses parts from different electronic devices to combine as desired. In this way circuit-bending also proposes the reterritorialization of the electronic device. Thus, by breaking the electronic devices to pieces and composing a new functioning device exemplifies the act of deterritorialization and reterritorialization. Colebrook states the Deleuze uses the "machine to describe a production that is immanent: not the production *of* something *by* someone—but production for the sake of production itself, an ungrounded time and becoming" (2002, p. 55). The concept of machine in this instance refers to the practice of circuit-bending itself because Ghazala practices circuit-bending for the sake of tinkering and therefore not to achieve a goal or desired end product. The concept of becoming does not have an end product or end destination but the ultimate fusion of the entity with its environment produces becoming-immanent. *Soundpoem Tank* for example is no longer a child's toy but has become an assemblage of multiple electronic devices. The practice of circuit-bending does not necessitate the use of e-waste. In *Soundpoem Tank* Ghazala uses outdated

electronic devices that are part of electronic waste. Through Ghazala's preferences he accepts e-waste to be a resource rather than garbage. *Soundpoem Tank* is the result of de- and reterritorialization. The practice of circuit-bending deterritorializes the obsolete electronic device and explores its innerworkings. Ghazala combines different aspects of various electronic devices, the combination of electronics in *Soundpoem Tank* represent the reterritorialization of the device.

5.2.2 Sound Through Motion

German artist Walter Giers uses circuit-bending to create interactive art installations. His artworks are categorized as electronic art. This is because circuit-bending is a practice not a category; therefore, the works of Giers are categorized as electronic art. The technique Giers explores is the "concept of aleatory music—a form in which some element of a composition is left to chance—as well as the use of self-playing instruments and repetitive loops" (electronicbeats.net, 2017). The installations do not focus on the practice of circuit-bending but rather on the use of electronics to create a unique experience. Whereas, the ultimate aim of circuit-bending or tinkering is not creating an artwork, but rather a practice in itself that breaks down the wall between object and subject.

Giers makes artworks that include spectacles such as light, sound and media. In some installations, Giers uses diverse ways in making the experience for his audience unique. He aimed at creating an interactive artwork that would give each visitor a unique experience. Therefore, the artist developed a randomizer that would create an unpredictable experience for the person, so that the installation does not become monotonous. This randomizer is executed in his work *54 Millionen Jahre* (2004), in which the sound which is the result of circuit-bending repeats itself after 54 million years. An earlier version of this installation was created in 1990 that was repeated in

shorter intervals. *54 Millionen Jahre* utilizes the practice of circuit-bending to affect the sensation of the individual interacting with it. The sound is randomly produced and not on a short loop, this creates a different sensation for each person experiencing it.

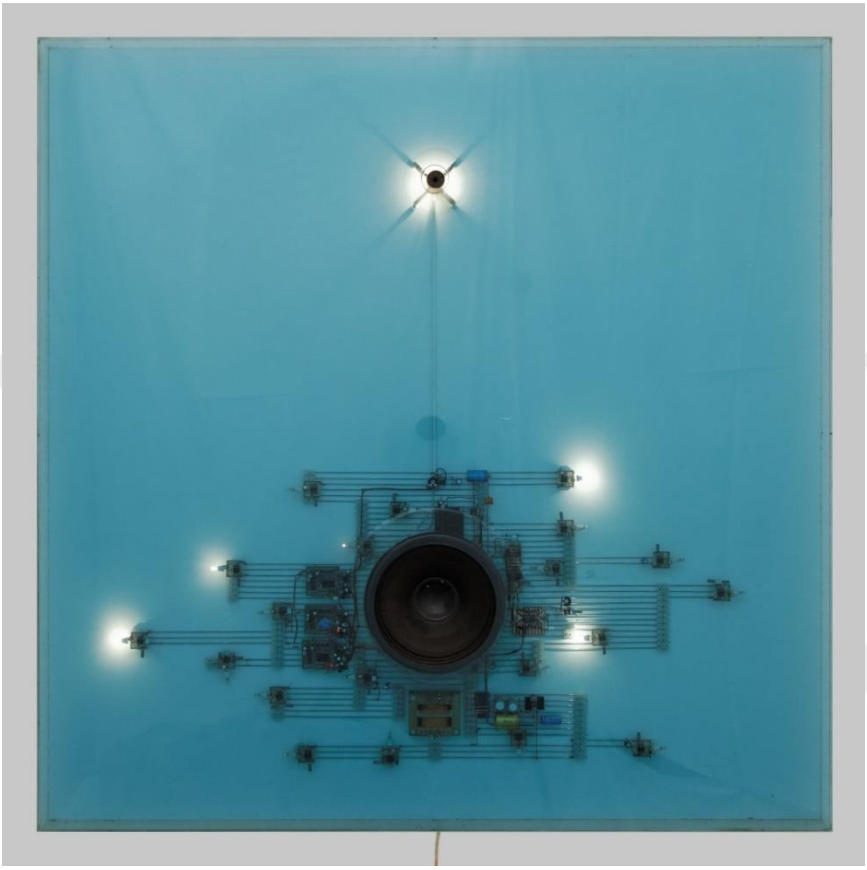

Figure 31. Giers, *PE I*, 1990, Acrylic, circuits, LEDs, microphone, speakers, 120x120x6

The installation *Brustbild* (1981) can be considered as a play of territories. By allowing the electronic object to react according to its environment, Giers allows for shifts in territories. The first territory belongs to the installation itself. The second territory belongs to the person interacting with the artwork. This proximity ignites the forces of territorializations, similar to the orchid and wasp and places both subjects in a brief moment of becoming. In *Brustbild* Giers encourages the audience to engage with the artwork, as touching the work triggers the output of sound. The manner in which the artwork is approached determines the output of the artwork. Both *Brustbild* and the person interacting with the installation are unaware of what

the result is going to be. This shows that in that moment of interaction the subjects experience a moment of suspension in their identities. This suspension indicates a mutual de- and reterritorialization. Giers describes *Brustbild* as follows: “by carefully touching the oversized breasts we hear pleasurable groaning, with rough handling of the breasts, the object switches to 'TILT' (flashing) and is no longer responsive for a certain time” (Giers, n.d.). The response of the installation differs according to the way it is touched; when touched roughly, the sound and the artwork becomes unresponsive for a short amount of time.

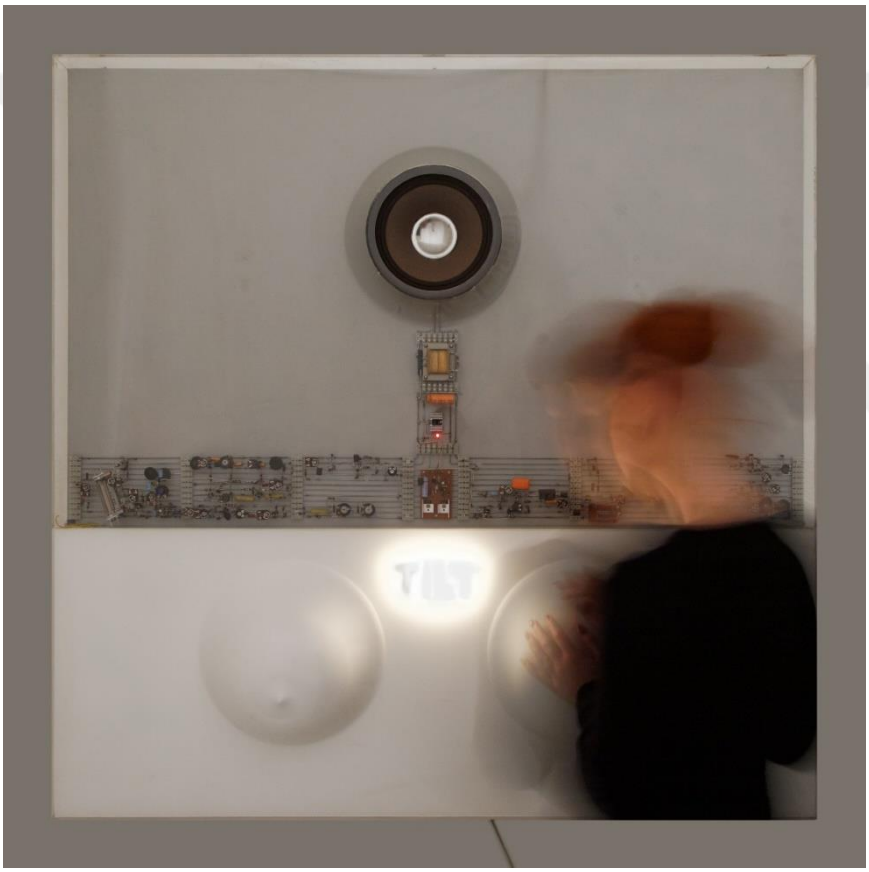

Figure 32. Giers, *Brustbild*, 1981, Acrylic, circuits, light, light emitting diodes, speakers, 120x120x6

These possible outcomes make each interaction unique for both the audience and the artwork. This indicates that the communication between artwork and viewer determines the sensation the work omits. The way the installation is approached results in different responses from *Brustbild*. The installation *Brustbild* does not only visualize the changes in sound through audience interaction it also represents the use

of circuits. It draws attention to the use of electronic circuits. Giers therefore does not create a black box that produces sound but rather exhibits the source that generates sound. In this manner the installations yield the potential for the deterritorialization of its audience through its demonstration of electronic components. *Brustbild* in a way is the presentation of circuit-bending in the form of an installation.

In the installation *PE I (*1990) Giers describes the interactive sound work as follows: "the object continuously records the sounds of the environment and reproduces them, slightly altered by an emotional filter" (Giers, n.d.). This shows that *PE I* is an artwork that is in communication with its environment. This relationship alters the outcome of sound. In *PE I* it can be argued that the installation in this instance is an example of de- and reterritorialization. *PE I* uses an emotional filter, as Giers describes, to produce a sound that is the result of its connection with the environment it inhabits. This form of communication results in the unique experience of both *PE I* as well as its audience.

5.3 Tinkering Methodologies

Tinkering is a similar practice to circuit-bending, yet whilst circuit-bending results in sound, tinkering aims at repairing, fixing, or merely understanding the electronic at hand. The DIY practice of tinkering was originally aimed at repairing one's electronic device. Manufacturers actively try to limit the consumers interference with the devices. This happens on a micropolitical level of design where manufactures consciously make it difficult for consumers to engage in practices such as tinkering, hacking, circuit-bending with the electronic devices. This form of planned obsolescence makes use of "difficult-to-replace batteries in personal MP3 audio players, proprietary cables and chargers that are only manufactured for a short period

of time, discontinued customer support or plastic enclosures that are glued shut and break if opened" (Hertz & Parikka, 2012, p. 426).

According to Hertz and Parikka, tinkering methodologies are vital in addressing the environmental impact of mismanagement in the production and discarding of electronics (2012). Parikka (2015, p. 4) states that

> instead of radio, I prefer to think what components and materials enable such technologies; instead of networking, we need to remember the importance of copper or optical fiber for such forms of communication; instead of a blunt discussion of 'the digital,' we need to pick it apart and remember that also mineral durations are essential to it being such a crucial feature that penetrates our academic, social, and economic interests.

Looking at media from the aspect of geology, as Parikka suggests, there is a "double bind between the relations of media technologies and the earth conceived as a dynamic sphere of life that cuts across the organic and the nonorganic" (2015, p. 12). This geological perspective to media allows for a connection to be established between nature and technology. The plane that exists between nature and technology becomes a ground where environmental ethics appears. Understanding the importance of geological matter in technology allows for a deeper understanding of the technology industry. Braidotti argues that "ethics begins with a responsible and accountable interaction with one's 'natural' habitat" (2006a, p. 121). I argue that a deeper understanding of how nature exists in technology allows for the emergence of a sense of responsibility. This sense of responsibility comes from the desire people have toward technological instruments. In this way "technological artefacts are powerful mediators for affectivity and desire" (Braidotti, 2006a, p. 121). Ultimately, Braidotti suggests there is "an alliance between bio-centred egalitarianism and the ethics of care as a micro-political practice" (2006a, p. 120). "In philosophical nomadism, no qualitative becoming can be generated by or at the centre, or in a dominant position," this indicates that as individual nomads, daily habits result in

vital differences (Braidotti, 2006a, p. 107). DIY practices such as tinkering can change the manner in which a person perceives electronics. The works of Benjamin Gaulon are especially based around tinkering practices.

5.3.1 Bringing Back the Dead

Benjamin Gaulon is a French artist, researcher and educator. His research focuses on "the limits and failures of information and communication technologies; planned obsolescence, consumerism and disposable society; ownership and privacy" (Gaulon, 2019). Therefore, it can be concluded that Gaulon engages in the political and ethical debate of environmental sustainability. His work is in fact concerned with current environmental debates. He is the founder and director of non-profit organization NØ SCHOOL "whose mission is to support and promote emerging art and design research and practices that address the social and environmental impacts of information and communication technologies, in France and beyond" (Gaulon, 2019). Besides, Gaulon organizes workshops where he teaches the DIY methodologies such as circuit-bending, tinkering and hacking. His focus is on the repurposing of electronic waste. Some of the other strategies he engages in and promotes are Tactical Media, Retail Poisoning, Urban Hacking (Gaulon, 2019). These practices are crucial in the light of technological sustainability, as they aim for a more conscious consumer as well as long-lasting or recyclable electronics.

The first installation of the series *ReFunct Media* was exhibited in the Irish Museum of Contemporary Art in 2010 with the name *ReFunct Media 1*. The installation consists of obsolete electronic devices that were "hacked, misused and combined into a large and complex chain of elements" (Gaulon, 2010). In this section I display photographs taken from two *ReFunct Media* installations. These installations are *ReFunct Media 7* (2014) and *ReFunct Media Modular* (2015-ongoing). In the

ReFunct Media installations, it can be observed that Gaulon—at times, with the help of other artists—uses all sorts of media devices. Within the category of electronics, they include old radios, monitors, children's toys, fans etc. Through tinkering with their circuits, they combine and connect the electronic devices as a form of chain to the following device, resulting in an installation that has multiple outlets, and multiple functioning aspects. However, the culminating hybridized form that is created as a result does not function in the traditional or original sense of the electronic. Rather, the screen of an obsolete television shows a glitched image, for example.

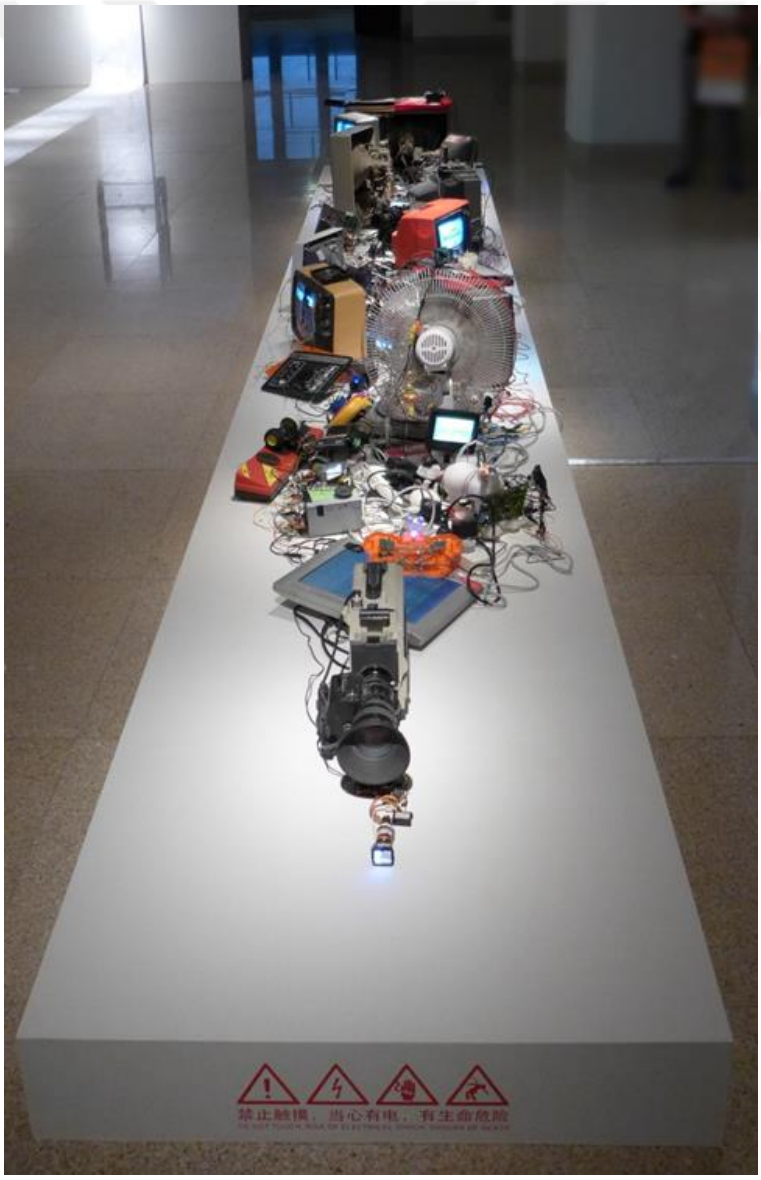

*Figure 33.*Gaulon, *ReFunct Media 7*, 2014, obsolete mixed media installation, 1x10, National Art Museum of China

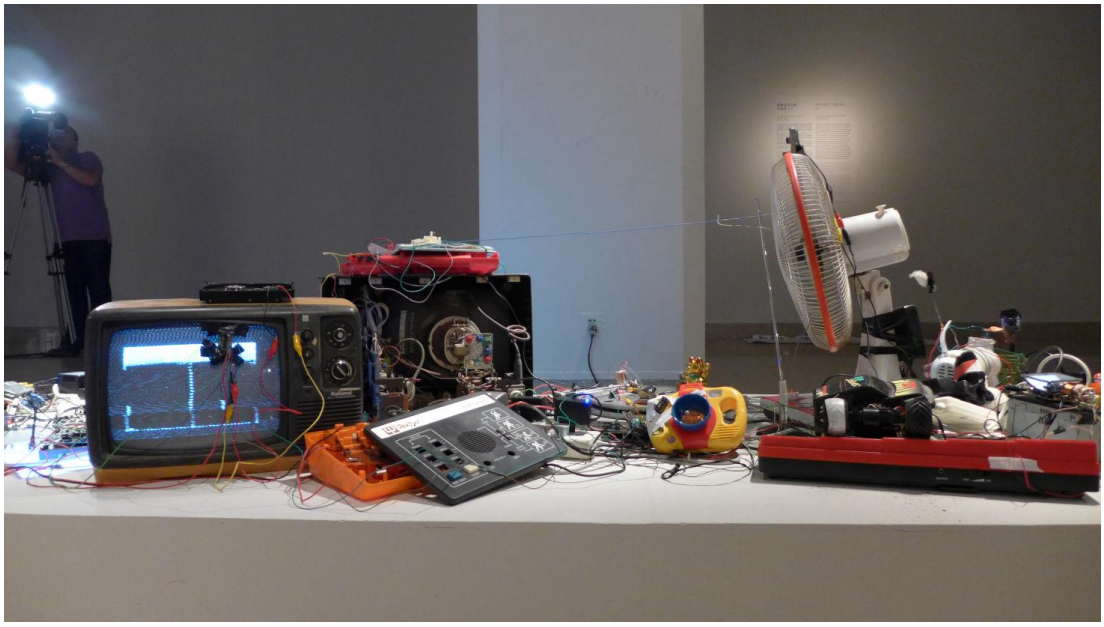

Figure 34. Gaulon, *ReFunct Media 7*, 2014, obsolete mixed media installation, 1x10, National Art Museum of China

Gaulon states that he does not propose a solution to the cumulation of electronic waste, rather he "experiments and explores unchallenged possibilities of 'obsolete' electronic and digital media technologies and our relationship with technologies and consumption" (Gaulon, 2019). It can be said that his ultimate goal is to awake the consumer by exhibiting the various range of technologies an average person is using. On top of that, by combining analog and digital media—old and new—Gaulon presses on the issue of obsolescence, and the rapid pace in which technology advances. This current era is defined by Braidotti as "the technologically driven historical phase of advanced capitalism" (2006a, p. 1). From the beginning Braidotti acknowledges that environmental problems are linked to advanced capitalism. This represents an acceptance of the human factor in climate change. Thus, Braidotti does not approach an anarchistic method of presenting nomadic philosophy. Instead, when "faced with these proliferating discourses, it is not a question of establishing new methodological or political hierarchies of values" but rather the "grounding of different ethical values concretely, historically and geopolitically, so as to be able to account for them" (Braidotti, 2006a, p. 93). Therefore, it is important to avoid

romanticizing philosophical nomadism as “an anarcho-revolutionary philosophy” (Braidotti, 2006a, p. 205). This nomadic path is not aimed at fixing current issues related to advanced capitalism, but rather “about multiple micro-political modes of daily activism or interventions on the world” (Braidotti, 2006a, p. 205). In the installation *ReFunct Media 7* everyday electronic objects are used. In a way Gaulon represents the electronics that are used over the course of decades. He does this by using both old and new media. In this sense, the electronic waste that is used to create *ReFunct Media 7* exists as nomadic objects. Through the re-use of these particular electronic devices that are part of the installation the path to sustainability continues. Nomadic ethics urges for a sustainable equilibrium. The electronic components that are used in the installation are connected to one another to transmit electricity. *ReFunct Media 7* therefore is an installation that brings back dead media and thus allows for the creation of zombie media.

Hertz argues that the problem of e-waste and sustainability “cannot be solved solely through creative repurposing, articulating and exploring the topic of reuse”, yet it is “essential in shifting assumptions of technological advancement, what it means to be innovative, and how to conceptualize electronic surplus as a rich platform for creative development” (2012, p. 182). Such practices of daily activism create awareness and a sense of embedded responsibility. This responsibility is aimed at achieving a bio-egalitarian order, which entails a “planetary responsibility for the future” in which a different perspective is sought (Braidotti, 2006a, p. 206). This perspective then does not assume a consciousness that is innately human but rather inclusive of other life forms. It is vital to accept the idea that “as embodied and embedded entities, we are all part of nature” (Braidotti, 2006a, p. 97). I suggest that Gaulon’s artworks engage in nomadic becomings because they tap into the feelings

of consumers. The installations reflect on the vast array of electronics that dominate people's lives. In *ReFunct Media 7*, a mundane electronic device such as a children's photography toy is used. I argue that this is to attract a feeling of care for a certain device. The children's toy that is placed in *ReFunct Media 7* might connect a person to a memory from childhood. Evoking feelings of care represents the beginning of becoming-nomad. Caring for an inanimate object allows for the de-centering of the human. Following this, sustainable approaches for consumption can be reconsidered.

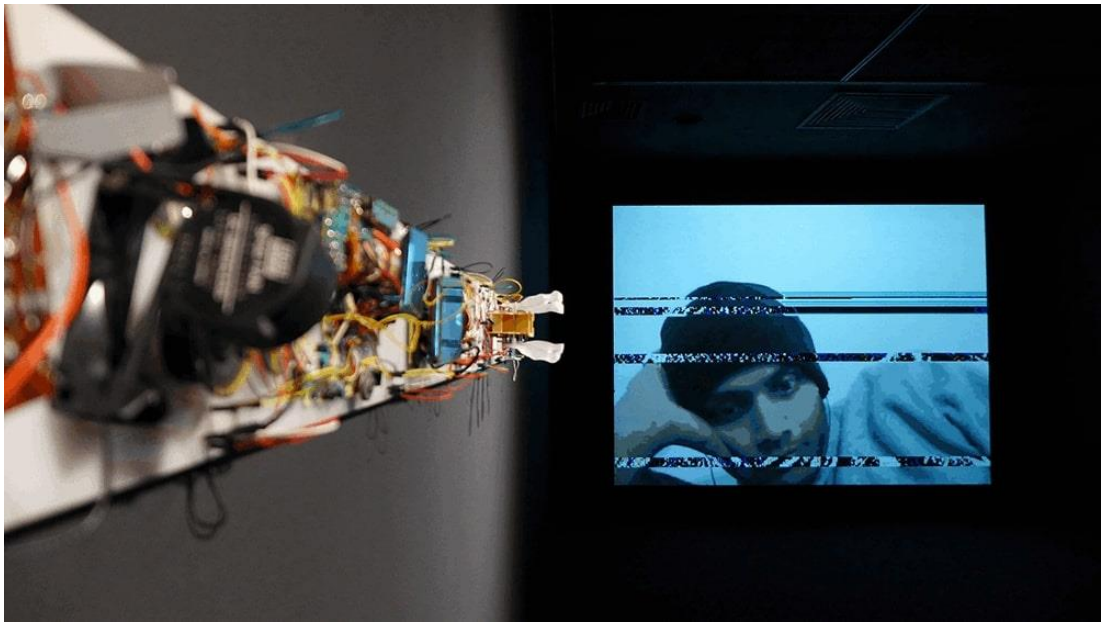

Figure 35. Gaulon, *ReFunct Media Modular*, 2015 (ongoing), e-waste/hardware hacking, 12x25

In *ReFunct Media Modular*, the combination of devices used are not an occurrence of luck. The electronic devices are placed by the artist but they do not propose a carefully design in order. Gaulon allows for obsolete media to come together to form a large assemblage. I suggest that the artworks in *ReFunct Media* installations are assemblages, as "an assemblage is a whole of some sort that expresses some identity and claims a territory" (Macgregor Wise, 2005, p. 77). This assemblage exists as a nomadic tribe. Each electronic device exists of multiplicities, these multiplicities are the coming together of entities engaging in becoming-nomad. In this sense Gaulon's installations can be considered as nomadic tribes that have come together to

represent activist strategies for a sustainable approach toward e-waste. In these installations each device has its own history of manufacturing, belonging to a consumer, and becoming obsolete**.** The history of each component of electronic devices can be considered a plateau that exists of many multiplicities. The electronic devices are constructed in factories this exemplifies a combination of earth elements that come together to function as an electronic device. Further, the coming together of electronic devices in Gaulon's installations exemplify another form of grouping. The plateaus that come with the elements create a rhizome. In this manner, this installation can be viewed as a rhizome that has different starting points.

Why is tinkering an important aspect in the ontological analysis of becoming-other/metal/earth? The practice of tinkering allows the consumer to engage with the electronic devices that dominate the daily lives of people. This practice allows for the consumer to understand, engage, and express curiosity to the innerworkings of electronic devices. It stimulates a curiosity that will inherently relate to the geophysical source of technology. Creating a chain effect tinkering practices ultimately will result in the questioning of the mass consumption of electronics.

Gaulon's installations allow the nomadic entities of e-waste to fight for their own sustainability. It is not about what art presents us, but rather what art can do (Colebrook, 2002). What can the *ReFunct Media* installations do in terms of affect? It is my contention that an installation like this can create the awareness about the number of electronic devices in our life. The ReFunct Media installations use simple electronics from fans to more complex electronics such as computers. The installations use old and new electronics to press on the effects of planned obsolescence that shorten the lifespan of electronic devices.

5.4 Conclusion

DIY cultures such as circuit-bending and tinkering prove to be practices that break down the invisible wall between the subject and the electronic object. Especially, nowadays electronic understanding of the devices among consumers is fading. DIY culture originated to fix broken devices but has become a practice of connecting to the electronic devices that we use in our daily lives. We have come to the point that we trust these devices to collect our data, and to handle important aspects of our lives. At the same time consumers are often not engaged with the construction, innerworkings and origin of the electronic device. Therefore, DIY culture does not only invite people who are interested in tinkering with devices, but also the consumers who are not yet aware of the makeup of media as well as its dominance in every aspect of human lives. DIY culture connects technology with nature by connecting the origin of electronic devices to geology.

CHAPTER 6

CONCLUSION

6.1 Conclusion

The modern era is defined by its abundance in consumer products. As a result, waste is an inevitable aspect that causes environmental problems. In this study, my intention was to expand—as much as this study allowed me—on the idea Parikka suggested: the geology of media. Parikka suggests that in media studies, media materialism should include the actual materiality of media devices. He argues that there is a gap in the study of media. This study aimed at finding a place—even so small—in this gap. I have taken on the issue of electronic waste through artistic endeavors that have used obsolete electronics as their medium.

This study scrutinized different artistic practices through a theoretical scope that combined the ontology of becoming, as proposed by Deleuze and Guattari, with the nomadic philosophy discussed by Braidotti. The main starting point of this study was Parikka's book *A Geology of Media*, in which he argues the importance of understanding the earth that actualizes technological devices.

The artworks presented in this study are on the same path as Parikka because they show the connection between technology and geology. This is achieved by the

reappropriation of electronic waste and through presenting it as a formation of chemical elements. This study focuses on a small issue in the gap Parikka mentions. In *A Geology of Media* Parikka (2015, p. viii) states:

> The relations to the earth are also part of the social relations of labor and exploitation that characterized emerging industrial capitalism of the nineteenth century as much as they characterize contemporary digital capitalism of the twenty-first century from mining minerals, geopolitics of the hunt for energy, and material resources to the factories of production of computational equipment.

Therefore, the issues on media as well as obsolete media can be scrutinized from multiple angles. These angles can be explored through different perspectives as this is an area that calls for further discussion. However, this study focuses on the perspective of already existing electronic waste. The contribution this study offers is its perspective on the variety of manners in which electronic waste can continue to exist.

The three analytical chapters have focused on different categorizations of artistic practices. The theme that groups the artworks in chapter three is their call for a political stance against current electronic waste management practices such as landfilling. The artworks by Cohen and van Balen focus on the flexibility in value concerning rare earth elements. The ores *H/AlCuTaAu* and *B/NdAlTaAu* are the combination of recycled metals from e-waste. The metals were 'mined' from obsolete electronic devices. The artificial ores stand for the potential that stays hidden in e-waste. The series of photographs in *Intolerable Beauty* by Jordan captures junkscapes as the result of mass consumption. I suggested that these photographs presented a flicker of affection and care toward electronic devices. The photographs present the necessary result of a consumption focused industry. This chapter also analyzed the following artworks which approached e-waste from a dystopic angle. Chatonsky speculates the future of archeology in his installations

Telofossils II, Relics II: Mothers and *Without Us*. These installations shift the perspective from human to machine. In the installations the electronic devices are attributed human emotions of loneliness, purposelesness and abandonment. Approaching e-waste from a non-human view allows for the perforation of a human-centered perspective. Chatonsky's installations introduce emotions such as care and sympathy for electronic devices. This creates space for the consumer to feel a sense of responsibility. In a similar tone, the installation *E-Waste* by Katherine Behar points out the double bind between technology and nature. The exhibition *E-Waste* exists of obsolete electronic gadgets that come alive generated by the earth's source of energy. The double bind is that the earth provides for the hardware and enables it. Chatonsky and Behar also focus on the cumulation of data in the soil. Both artists speculate a dystopic future without humans in which electronic devices function and treasure data.

The artworks in chapter four group around the persisting theme of worth and value. All the artworks presented in this chapter consists as a decorative commodity. These products are made of electronic waste. In a way the artworks present the creation of e-waste as a new resource. Dishaw creates sculptures entirely made from scrap electronics. The sculpture *Apple Vader* by Dishaw represents the creative and unique solution to e-waste. This approach allows for the nomadic formation of rare earth elements to form multiplicities. These multiplicities suggest the collective fight of rare earth elements which deny environmental intensities of deterioration. This chapter continues by analyzing the accessories created from e-waste by Fujimaki and Ikeuchi. Fujimaki creates jewelry from obsolete PC circuits and Ikeuchi uses obsolete media to create futuristic cyberpunk-themed accessories. Both artists approach electronic waste as a resource. The accessories created by Ikeuchi suggest a

double meaning between the past and the future. The accessory *Pulse Launcher Unit* by Ikeuchi symbolizes a futuristic gadget that enhances the human body but at the same instance the accessory is created from outdated obsolete media. The accessory suggests a desire for such future and acknowledges its association with current management strategies concerning e-waste. Lastly, Koffi creates tableaus from obsolete mobile phone keyboards. *Aya's Scream* exemplifies the entanglement of e-waste with the inhabitants of Ivory Coast. Koffi internalizes the problem of e-waste and mirrors the impacts of e-waste on his community in his tableaus.

The unifying theme of chapter five is concerned with DIY culture. DIY culture includes practices such as circuit-bending and tinkering. These practices break down the invisible wall between the consumer and device, as well as the manufacturer and the consumer. Ghazala practices circuit-bending through which he creates alien devices. *Soundpoem Tank* represents what Hertz and Parikka call zombie media. Through the reappropriation of e-waste, circuit-bending creates zombie media. These obsolete electronics reject the classification of waste. Most discarded media still work thus are not broken and useless. Gaulon approaches electronic waste from tinkering methodologies. Gaulon creates series of installations titled *ReFunct Media*. The installations include a variety of commonly used electronics including a child's toy, a fan, and a computer. The combination of simple and complex as well as old and new media suggests that the origin of all electronics are the same. The installations connect nature with technology. Technological devices are made from and enabled by the earth.

This study explored ways in which rare earth elements can find value again. The use of electronic waste as an art medium allows for the becoming of each entity to take forth. The philosophical concept of becoming supplied fruitful ground to analyze rare

earth elements in the process of becoming-other/metal/earth. The flux state of becoming and change highlight the simple yet complex process of life on earth. Life in this sense includes inanimate entities such as rare earth elements and obsolete media. The continuous construction and re-construction of entities, groups, ecologies allow for sustainable practices to emerge. Therefore, the reappropriation of e-waste allows for the shift in negative environmental impacts of a technological society. Sustainability is the core motivation that connects all approaches concerning obsolete media. The 'Dead Media Project' was started by science fiction writer Bruce Sterling in 1995. Sterling called out for a compilation of stories concerning obsolete media to create an historical catalogue of the rapidly evolving technologies. Since Sterling's manifesto in 1995, obsolete media has entered into the literature of media studies. This study explored the various manners in which already existing e-waste can be repurposed. However, what calls for further investigation is approaches to design and sustainability before the electronic product reaches its consumer. This study shows the durability of rare earth elements through the perspective of becoming. The process of becoming is separate from a human initiated force and thus allows for a non-human perspective. The artworks presented in this study approach e-waste by de-centering the human factor. In a similar tone, Parikka states that "artworks that actually tap into this geological materialism might be in a key position to open our eyes and ears to something rather different: they offer visuals and sounds of the nonhumans" (2015, p. 67). Therefore, future studies concerning the geological aspect of media might expand the focus from human to a wider ecology. Besides this earthly approach, the processes in the making of electronics such as labor, mining, manufacturing, designing, coding, and the diverse types of waste management can also be explored further. The use of e-waste in artworks suggests an afterlife for electronic waste. Especially artworks that present functioning devices from e-waste

realize zombie media. Media after it becomes obsolete is an area of study that can be further explored through various perspectives.

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