UNIVERSITY OF
FORWARD THINKING
WESTMINSTER⌗

WestminsterResearch

http://www.westminster.ac.uk/westminsterresearch

Hacking Antarctica

Perez, A.

A PhD thesis awarded by the University of Westminster.

WESTMINSTER UNIVERSITY

MEDIA ART AND DESIGN

HACKING ANTARCTICA

Alejandra Pérez Núñez

Supervised by

Dr. Neal WHITE

Dr. Tom CORBY

February 20, 2020

Contents

List of Figures

Author's Declaration

I declare that this thesis has been composed solely by myself and that it has not been submitted, in whole or in part, in any previous application for a degree. Except where states otherwise by reference or acknowledgment, the work presented is entirely my own.

Abstract

Hacking Antarctica is an investigation focused on rendering aesthetic responses to Antarctica beyond normative representations of the sublime and the imperceptible. It is based on fieldwork in polar and subpolar areas over the last 9 years. At its core, the research uses Immanuel Kant's Critique of Judgement as a way of understanding what is meant by the sublime and from that develops a practice that examines what a Kantian lack of access to nature implies.

This key Kantian concept is explained and devised into art works and then tested through concepts such as translation, transduction, infection and representation, using hacking methodologies informed by bricolage (Lévi-Strauss 1968), and diffraction (Barad 2007). The research expands on the taxonomies of the polar to reconsider the Antarctic as a border and periphery, bringing a conjunction of hacking methods and site-specific art that enables a performative causality with which to study the production of site. In other words, a performative approach as Barad and other feminist writers recognize, is questioning the traditional causality of ends and means and observer and observed and rather focuses on processes within discursive practices. Causality is reworked as a local externalization of the intra-acting relations of matter.

Within the overall system of research for Antarctica, technical methods used included; Free Libre Open Source software and hardware techniques, black and white and infrared photography, ultraviolet light sensing, sound recordings, hydrophone recordings, very low frequency recordings, AM radio sensing, error in photography (light leakage, displaced focus), in text (cut-up compositions), in video (glitch) and error in bodies as infections; bio-sensing agents (including yeast and lactobacillus), point-array analysis, translation of images to raw data, and from raw data

to sound, land art performances, spatialization of sound, stereo panning, quadraphonic sound, interactive embroidery, radio broadcast and installations.

Specific outputs include: Antarctica 1961-1986 (2017), an interactive embroidered map of Antarctica showing sites of mineral sources and mineral pollution. The map was installed as an interactive instrument that allowed visitors to participate in the live shaping of the spatialization of sounds recorded in Antarctica. A digital Theremin sensor attached to the map was interfaced with Pure Data software running on a GNU-Linux Debian station. All software was made visible as well as the papers documenting the traces of the plutonium found there.

The research through an experimental set of hacking practices supported the hypothesis that Antarctica can be represented outside the sublime through the polar-site produced by hashes of proxies and the diffraction produced when superposing modes of knowing. The interruption of the spectacle to respond to Antarctica is the result.

Acknowledgments

0.1 Introduction and project hypothesis

My research seeks a new understanding of how Antarctica might be addressed as a problem of representation beyond normative approaches which draw upon traditions of the heroic and the sublime. Can Immanuel Kant's notion of the sublime be used as a lens to problematise current art practices concerning the Antarctic?

Within these historic and existing approaches Antarctica is seen as a region consisting of imperceptible phenomena that are fundamentally unpresentable, thereby problematising more nuanced understandings of how it might be conceived. What aesthetic responses to Antarctica can be produced through art practice beyond normative representations of the sublime? This project seeks to know what is figured about nature and the Antarctic through art practice and producing more heterogeneous responses to Antarctica through practice-based and site-specific art research from a media-art perspective.

Research has been carried out via practice-based art-making as a series of field trips between 2009 and 2017 to remote sites in Antarctica and subpolar regions including continental sections and islands in the Magellan Strait, the Beagle Channel, and the Antarctic peninsula. In order to register nuances in relation to these places, sites in high places like Puyehue volcano were taken into consideration and urban sites like the sewage water pond in Lordship Recreation Ground in Tottenham were also employed at different times. In this thesis and through my art practice, I have developed an extended concept of hacking, that draws from methods of bricolage (Denzin 1994), that is, using research as a process of making (and un-making) working with whatever is at hand and what is suitable to the immediate task. Hacking is considered relevant in this context since it may be looked at as a combination of knowing and not knowing i.e. being open to the relations between ontologies, and that can simultaneously critique and develop new insights from process-driven approaches. These hacking practices will focus specifically on aspects of imperceptibility that correspond to the occlusion of information in Antarctica, thus considering the region not only as a geophysical ontology but also a geopolitical one.

The Antarctic regions are an elusive subject of study, an environment of extreme conditions and an inhospitable site. Contemporary exhibitions, publications and seminars have demonstrated how Antarctica has drawn artists, writers, scientists and other explorers throughout history as a pristine place in which to practice science or as an imaginary site of sublime beauty as an example, *Vanishing Ice: Alpine and Polar Landscapes in Art 1775-2012* [1] (2014) curated by Barbara C. Matilsky and *Polar, the Art and Science of Climate Change* [2] (2007) commissioned by the Arts Catalyst and curated by Kathryn Yusoff at The British Library. Publications have been edited showing the work of artists in Antarctica and the Arctic such as Bipolar, archive fever (Yusoff 2008*b*)(Yusoff 2008a), Far Field, Digital Culture, Climate Change, and the Poles (Marsching & Polli 2012) and Icelab, New architecture and science in Antarctica (Ross & Richardson 2013). Other examples of the history of this discussion are the "Feminist and Scholar Conference" deployed together with astronomer Laura Kay on the Arctic and the Antarctic held in 2008 in Barnard college (Bloom & Glasberg 2011, p120) and also the Anthropocene Feminism Conference held in Milwaukee in 2014 (*Anthropocene Feminism | April 10-12, 2014* 2019). Overall however there is very little sustained research from a practice-based perspective that specifically focuses on problems of representation in the region.

Antarctica has been represented largely through heroic narratives rooted in conceptions of the sublime and is often associated with heroic narratives of discovery linked to conceptions of landscape and the sublime. The sublime is a complex topic the extent of which is beyond the scope of this project, but is known not unproblematically through the writings of Edmund Burke and the transcendental philosophy of Immanuel Kant. Some consideration of this work is given in this chapter as their works touch on issues pertinent to the topic, but acknowledgement is also given to the limitations of a philosophical tradition as considered by feminist philosophical traditions. In "The Concept of the Beautiful in Kant and Lyotard" Cornelia Klinger for example, has argued that Kant's formulation of a distinction between the sublime and the beautiful demonstrates the problem of dualism in his thinking which mirrors the dualism of gender (Klinger 1995, p192). The tradition of the Western sublime in this critique frames it as highly gendered with a tendency to-

---

[1] http://www.vanishing-ice.org/ Last accessed in February, 2019
[2] http://www.artscatalyst.org/polar-art-and-science-climate-change Last accessed in February, 2019

wards violence. Similarly, Hall in "Sensus Communis and Violence: A Feminist Reading of Kant's Critique of Judgment" has noted that Kant's theories were influential in establishing narratives of discovery and conquest within the politics of colonialism which we see as a highly visible phenomena in heroic thematics attached to exploration narratives of Antarctica (Hall 1997, p258). We explore this issue in detail further in this chapter and discuss how alternative thematics and responses to the sublime representations of Antarctica have been developed by women artists in section 1.4.

According to Apsley Chery-Garrand "Polar exploration is at once the cleanest and most isolated way of having a bad time which has been devised (...) I do not believe anybody on earth has a worse time than an Emperor penguin" (Cherry-Garrard 1922, XVII). The heroic era explorers nurtured the idea that the Antarctic landscape is linked to suffering, sacrifice and unrest. The explorers took their bodies to the extreme in a place of inhuman forces in a search that was bordering madness. Sir Douglas Mawson described the continuous hardships attenuating the genuine enthusiasm related to scientific discovery in "*The home of the Blizzard*" (1915) [3].

> Any trace of elation we may have felt at this meteorological discovery could not compensate for the ever–present discomforts of life. Day after day the wind fluctuated between a gale and a hurricane. Overcast skies of heavy nimbus cloud were the rule and the air was continually charged with drifting snow (Mawson 1915, p76).

Similarly, Robert Falcon Scott describes "an awful place" but was later sobered by the news that the Amundsen expedition had preceded his adventure by five weeks. His tragic attempt at the pole reinforced the image of Antarctica as an inhospitable place of sublime beauty, where colonial triumphalism can be crowned. The concept of sacrifice was widespread amongst explorers: for country and science. Scott records:

> to feel the wet clinging dampness of clothes and everything touched, and to know that without there is but a blank wall of white on every side – these are the physical surroundings. Add the stress of sighted failure of our whole plan, and anyone

---

[3]the travelogue of the disgraced Australasian Antarctic expedition (1911-1914)

must find the circumstances unenviable. But yet, after all, one can go on striving, endeavouring to find a stimulation in the difficulties that arise (Scott 2019, p24-25).

Frustration, desolation, limitations are recurrent in the different narratives of travelogues and diaries of the heroic expeditions as well as awe and curiosity when confronting the strange features of the polar landscape. This ambivalence characterizes the first explorations. The ambivalence between, terror, pain and the furious beauty of extreme nature.

Antarctica has been considered an index of the Arctic and nowadays, a reference for outer space exploration. A territory that is the reference of another, it is not "the thing in itself" in Kantian terms. For knowing Antarctica there is always the need for mediation. As it will be demonstrated in the following sections, the sublime is a type of representation that synthesizes the impossibility to access nature and all otherness different from oneself.

The thesis is structured in four chapters. The Contextual Review commences with a definition of site, in order to address visual arts historic issues with ideas of site, space and place. A scope of interpretation is defined to delimitate the problem of research framed as the study of the production of polar-site. This is a framework to understand Antarctica and the production of imperceptibility.

The chapter continues defining terms, out of the need to disambiguate notions that are highly charged in the history of art, specifically landscape and place. These emerge out of the Antarctic continent, out of its history and that of the history of European colonization. Thus, the landscape emerges from the activity of conquering and later out of mapping, Antarctica was constructed with a purpose, that of being mapped, circumnavigated, possessed, objectified and controlled.

The map becomes the image in the case of the Radarsat Antarctic Mapping Project. Developed by the NASA and NSF* (National Science Foundation, USA) it demonstrates its participation in the "third age of exploration", according to the continuum in the heroic periods of Antarctica that Stephen Pyne and others trace. Antarctica is pictured "floating in space", claims Elena Glas-

berg, dismembered from the other continents, with no reference to the planet Earth but to outer space. This visualization marks a transition but also a continuation of the type of representation that is based in the feeling of the sublime.

This contextual review therefore engages with the notion of the mathematical sublime, part of the metaphysics of Immanuel Kant, to analyse the representations enabled by technology with a particular emphasis in cases derived from media art practices. Those works will be triangulated within against the scope of interpretation, the vectors of geopolitics, science and environment producing polar-site. The main critique arises from a relation of distance implied in the sublime and in its enunciation imbued in a witness narrative.

Distance is criticised in another activity that accompanies the Antarctic landscape, that of walking. As it has been a subject that is analyzed along with the embodied mind, it involves a recuperation of the materiality and the end of the distance. It becomes a hint to more contemporary traditions, mainly feminist framed under the ecofeminist perspective that renders some methodologies that are introduced in the practice of this research.

Characteristic of this line of thought is the emphasis on the lack of borders, the return to the body and the bodies and materialities as it also means a decentering of human. The ontology of ice, a term coined by Elena Glasberg helps to describe the sort of relationship with Antarctica that integrates the dimensions discussed before, science, environment and geopolitics.

Finally, the scrutiny over traditional sublime representations imposes the end of the Antarctic simulacrum, as named by the artist Anne Noble, and to any hegemonic representation. The interruption of the spectacle releases conceptions about the Antarctic and the sublime. Out of the analysis of different polar artworks, some methods are listed and a reflection on my methods starts.

Firstly it is stated that lists are the main method. The type of list that is exemplary to this work

is the hash data structure, that derives from lists but is open to incorporate elements, to locate them by the identification of its indexes. Hacking performs a patterning, a hash of different modes of knowing. The way to access site is enabled by hacking through patterning hashes. Thus, the means to know the site also produces it as an abstraction and a list, indexical in nature.

Following this introductions, more descriptive work is then presented and is divided into three categories. Sound cartography, Polar pollution and Non-Site. Sound Cartography englobes the fieldwork in Polar and subpolar areas. Including Greenwich Island and portions in the Magellan Straight reaching up North up to Volcán Puyehue. Polar pollution groups artworks working on peripheries and geopolitical borders to conceive of a new concept of polar that includes extreme conditions as pollution, poverty and geopolitical tensions. Finally, the artwork grouped under the concept of Non-site signal the use of proxies to produce and investigate the site. Non-site is rooted in a conception of non-separability.

Within these contexts, the fieldwork research methods consist of a series of experimental performances in polar and subpolar-sites. The chapter summarizes these methods and demonstrates the possibility of using them simultaneously. This is interesting in terms of experimental structure but also in terms of claiming a non-hierarchy between modes of knowing and modes of being.

Within the contextual review, the sublime enforces a hierarchy, a division between what it is possible to know, and, what it is not possible to know. I have highlighted that in the Critique of Judgment by Immanuel Kant the "aesthetic judgment" is described next to other types of judgment such as the reflective judgment, as a fundamental part of human cognition, that provides the notion of purpose

These contentions are scrutinized in the chapter, Hierarchy. A description of the Aesthetic regime, amply theorized by Jacques Rancière kicks off the chapter that enforces the idea that there is a "position of mastery" entailed in discovery, of making others know what is not known. The notions of the chapter are introduced by the works developed under the taxonomy of non-

site, that emphasizes the hacking practices involving the use of more-than-human-agency. In the end, the chapter will make a comparison between the aesthetic regime analysed by Rancière and the processes of sympoiesis described by Donna Haraway in the context of the Anthropocene. The discursive practices identified by the feminist writers like Haraway and Barad and the ontological inseparability is considered a methodology that is embodied in hacking where the way of knowing is altered by the way of being.

The chapter Hierarchy shapes the critique of the sublime that this study structures and that may be framed under the eco-feminist response to the Kantian sublime. In the end, what is embraced through the work are responses that alter the mind such as laughter and error. One of the artworks, Un sublime asentamiento, will be exemplary of this argument.

This leads to the chapter Analysis, in which different methods deployed in the practice of hacking, performed throughout this research will be demonstrating the use of more-than-human proxies as a hash patterning enabled by hacking. The imperceptible may be interpreted as silent speech. We may say that the fermentation produces not-knowledge and that these actions, performed to study polar-site or the production of imperceptibility, are apparatuses to "dismantle hierarchical orderings implied in representation" (Rancière 2005, p14).

The analysis develops as a diffractive text firstly based on the questions raised by Henry Lefebvre in The Production of Space (Lefebvre 1991), about the nature of space. His writings about rhythm analysis (Lefebvre 2004) were also considered. Secondly, it takes into account the elaborations of Karen Barad and Donna Haraway about diffraction and the implications that the "diffractive grating" has for a theory of science that combines ontology and epistemology. Lastly, the work of Jacques Rancière, on the distribution of the sensible to incorporate his analysis in the realm of logic to the diffractive writing. It does so, by evidencing the orderings implied in representation and the hierarchies involved in the sublime.

As is discussed further, the 'hacking' methodology enables aesthetic access to Antarctica through

the use of measuring agencies and "agential cuts", through the combination of three vectors of analysis: geopolitics, science and environment. As such, techniques borrowed from science but relocated within a field of artistic practice are termed 'proxies'. These are used to mediate the relation with the polar-site through its not-accessing or not knowing. This is considered a multispecies epistemology where modes of knowing and of not-knowing enable access to the imperceptible.

It is necessary to come back to Immanuel Kant and to his notion of imperceptible as that which is not possible to know as it will be contested that the hacking practices enable oscillations of accessing and not accessing the polar-site. I will bring this idea further as to link it to Digital Signal Processing since it enforces an alternation of ones and zeroes enabled by the physicality of a continuous 5 Volt signal.

Patterning is crucial to incorporate at this point. I have equalized several concepts under this rubric, like discursive apparatuses and discursive practices. It directly alludes to the work of Donna Haraway on string figures and how the string figures produce matter. In this sense, the discussions on discursive practices argued by Donna Haraway, for example, fermentation, digital signal processing, transduction, pain, hashing are indentified.

At this point, it becomes necessary to also introduce the notion of apparatus to enforce a relationship with technology as well as with theory and experimental designs. The apparatus is absorbed in the notion of patterning, engaging with Barad's intra-mattering between the experimental design and matter and enquiring the dynamism of space-time-mattering.

The use of an intermediary was used in different instances, when using sensors to record environmental keys but also when using a fermentation process to study site through rendering a non-site. It can also be found when using the body to study and produce the site. During fieldwork I felt the use of sensors was modulating my phenomenology. I started using my body in close contact with the land and in aberrant postures to defy rational axis. The use of a proxy

ontology was also observed through a skin infection contracted after being on-site.

The proxy is an index or a hash of indexes, in the case of an ice core and it is a non-site since it is made of other sites. A hash of sequences of accessing and not-accessing polar-site exceeds site, it overflows with sites, as in Robert Smithson's mirror experiments, for him space was produced by the reflections. In this case, it is argued that space is produced by the diffractions, the superposition of modes of being since those modes of being are also modes of knowing.

The method that was developed, hacking, can be considered an onto-epistemological engagement, as it produces the polar-site due to the patterning produced by hashes of hacking both devices and the different practices. This thesis therefore takes into account the apparatuses devised for the research as part of the system of inquiry and in the final section of the thesis, these ideas are expanded upon in order to reflect on the contribution to knowledge that this thesis achieves. To this end, it highlights the potential future research that may be followed from these lines of enquiry and points to a corpus of work developed in this research that produces a diffraction pattern through which to investigate the imperceptible in Antarctica.

Patterning as a concept has been used by Donna Haraway and Karen Barad. The latest, enquiring the dynamism of space-time-mattering. In this investigation, patterning counts for apparatus, the dismantlement of truth, discursive practices, hashing, measuring agency and "name of action". It may be seen in the table at the end of this thesis, diverse patterning as forms of accessing, knowing and representing Antarctica. Those patternings are transduction, fermentation, infection, digital signal processing (DSP), glitch, error, cut-up text.

Chapter 1

Contextual Review

1.1   Defining terms: Site

This study relates specifically to Antarctica and the polar regions as remote sites of cultural activity. As an object of study, the concept of site overlaps with many disciplinary areas including landscape, place and space and many forms of artistic site-specific practice, some of which we will review first before moving to the specifics of Antarctica. Environmental issues are touched on, but the scope of this study is not generally inclusive of the vast literature and practices of eco-art or ecological praxis per se except when they directly relate to the poles as a region and in relation to the critique of science raised by ecofeminism. The genealogy of the concept in site-specific art is needed to understand the scope of the term in relation to this research. For Miwon Kwon, from a contemporary art perspective in its earliest modernist formulations 'site' is described as "an inextricable, indivisible relationship between the work and its site" functioning as an aesthetic component in a set of relations between object, locale and the audience's attention (Kwon 2002, p12).

Later conceptual approaches moved on from this spatial and geographic concept to conceive of site as "a cultural framework denied by the institutions of art" (Kwon 2002, p13). This institutional critique attempted to make visible hidden social and material relations of site and to render visibility to "the system of socioeconomic relations within which art and its institutional program-

ming and their possibilities of being" (Kwon 2002, p19). A paradigmatic work of this ilk is Hans Haacke's Condensation Cube (1963-1965). The project takes into consideration the absent aspects of a site, neglected, invisible or occluded, such as the gallery space, rendering otherwise imperceptible phenomena including atmospheric moisture that was allowed to "invade the pristine minimalist art object (a mimetic configuration of the gallery space itself)" (Kwon 2002, p14). Rosalind Krauss's radical theoretical approach highlights works that operate in a "neuter axis" as they are "not landscape, not architecture" (Krauss 1979, p37). The phenomena of site derives from the postmodern condition "within the situation of postmodern practice [that] is not defined in relation to a given medium - sculpture - but rather in relation to the logical operations on a set of cultural terms, for which any medium - photography, books, lines on walls, mirrors or sculpture itself-might be used" (Ibid., p42). As for example in the works of Agnes Dean, Richard Serra, Richard Long amongst others, the artwork is both a site materialized in a particular time or place but also a site of discourse (Ibid.).

James Meyer promotes a similarly discursive concept of site by arguing for a distinction between "literal site" and "functional site" (Meyer in Suderburg 2000, p24), with the former an actual location and the latter defined as a set of texts, critiques institutional framings. This expanded notion of site is again emphasised by Miwon Kwon who proposes that: "contemporary art practices transform the definition of site from a physical locale to a discursive vector - ungrounded, fluid, virtual" (Kwon 2002, p29-30).

Kwon, in contrast to the formulation of site by Lucy Lippard as a portion of land, including cities, towns and natural environments (Lippard in Kwon 2002, p158) also formulates site specific approaches in art as relational formations that address differences between different social and material agencies. Ultimately when thinking of site, Kwon argues we should consider a typology of different approaches including "site-determined, site-oriented, site-referenced, site-conscious, site-responsive, site-related" (Kwon 2002, p1). Consequently, this consideration of site as a connection of non-visual phenomena, relations and processes, stretched the boundaries between artwork and environment and challenged and blurred the concept of the individual self and the

location it occupied. There is no longer interior or exterior as expressed in Robert Smithson's works on mirror displacements where he reflects upon the idea of the site as "inexpressible limits on the other side of incidents" (Smithson Flam 1996, p124), rather site comes into being as a vector of psychological, sensed and material relations, which in Kevin Lynch's phenomenological mapping of the city declare site "caught in the movement of its being performed" (Kaye & Art 2000, p118). A performative understanding of site also emerged in the work of Robert Smithson in *A Tour of the Monuments of Passaic New Jersey* (1967) and in other works Smithson walks the urban derelicts places of suburbia highlighting a performative dimension of land art that starts with a dialectical practice of mind, walking and site. Nick Kaye explains Smithson's approach as "a dialectical reading of the site" (Kaye Art 2000). Smithson himself described this dialectic as a "back and forth rhythm that goes between indoors and outdoors" (Flain in Kaye & Art 2000, p94).

This conception of site, destabilizes the geographic certainty we come to associate with the term. For Kaprow, the identity of life and art "is uncertain" (1966) describing his own attempts to articulate site as a process of erasure "breaking down towards site" (Kaye & Art 2000, p112). These mobile and uncertain conceptions of site converge into a performative understanding where it is created as it is investigated or exposed, performed or lived. Recent discourse stress site as a more complex set of material, virtual and semiotic agencies, through a rethinking of it as a 'situation'. Claire Doherty (Doherty 2009) proposes a situational aesthetics that emphasize "moment over time, direct experience of multiplicitous complexity over the singular simplicity of distanced reflection" (Smith in Doherty 2009, p13). Thus site in this reading is something to be experienced as fleeting, affective encounters through a performative situation, the site is thus rendered as and through "presence".

Site as process, material and the performative is explored in more contemporary forms in the work by Martin Howse, that combines the booting of computer logics through contact and manipulation of soil. In the *Earthcodes* projects (root 2018), he investigates the "site of execution" or "the point of transition between ... raw material substrate and some kind of inscribed logic which

can be bootstrapped into complex symbolic manipulation (correspondence 2012)" (Whitelaw 2013).

We might ask where is the site in Howse's executions? It seems to drift between geologic, mathematical and electronic logics. Site in this sense functions as an abstract and material performativity, as a multidimensional array of agencies, human, computational, geological, electrochemical. It is this sense of site, that research builds from but set within a specific Antarctic context. Further discussion of the particularities of the Antarctic site are given in the following section.

1.2   Scope of interpretation

1.2.1   Antarctica and polar-site

The following diagram describes the key problem that research seeks to answer and articulates how we might conceive of a "polar-site". Arguably, historic and contemporary art forms seeking to engage Antarctica have not considered or acknowledged that representing it requires a "full spectrum approach" that integrates the three different domains of Geopolitics, Environment and Science represented in the diagram to understand Antarctica beyond normative environmental and 'sublime' representations.
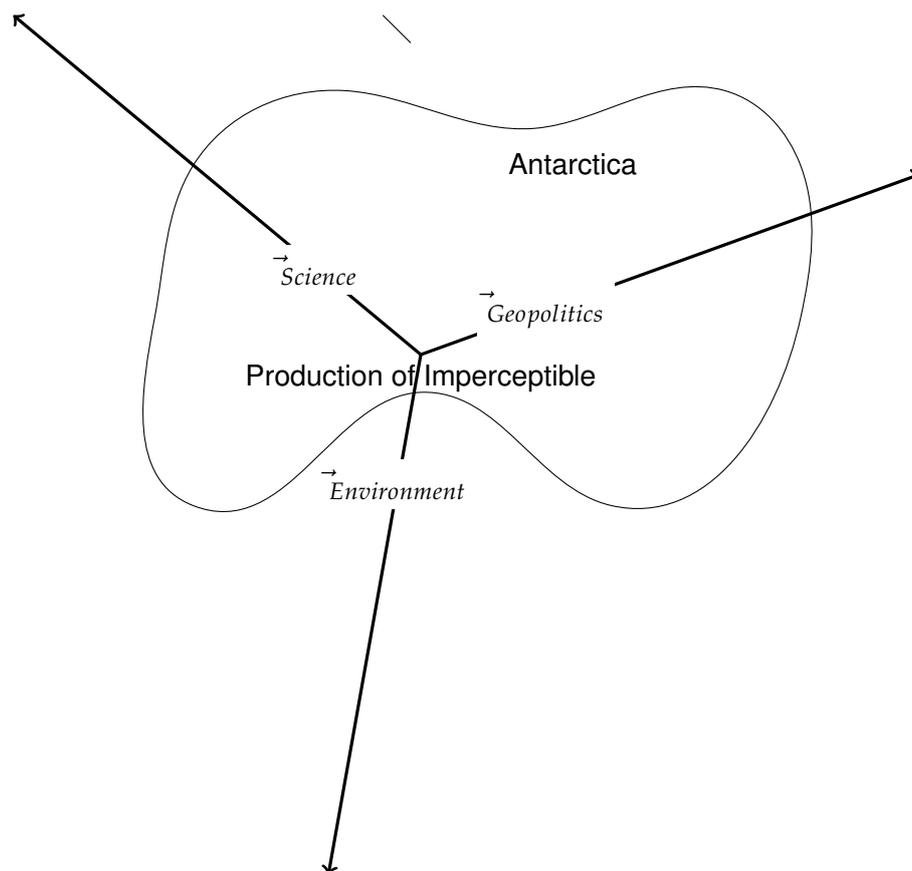
Figure 1.1: Diagram of the polar-site

Before examining historical and theoretical material it is useful to return to practice-based elements of research. I devise overlapping themes to group practice in this research: Sound cartographies, Polar pollution, and Non-site. Sound Cartography refers to work realized in fieldwork initiated in Antarctica extending to subpolar areas of the Magellan region and concerns itself with the concept of 'polar-site' and how to access it. The field trips take an exploratory and experimental form, employing methods of data gathering, apparatus and sensor technology development, different sorts of measuring proxies and documentation including the keeping of a research diary. These approaches take methods from science and technology (e.g. sensor development and data gathering) but deploy them towards artistic, aesthetic and critical ends. Thus, one of the main methodological approaches developed by this study is the appropriation of data sensing approaches from the scientific domain with the intention of exploring their potential to produce cultural responses to scientific truth. This derives from established practices in the media arts (see for example Corby, YoHa and Mongrel) in that science and technology are valued over and above their normative knowledge producing functions and can be deployed to develop critical and cultural insights into contemporary phenomena through integration into art production.

It may be argued that in Antarctica, invisibility occurs as a result of global geopolitical treaties governing the poles, in particular, the International Treaty System, that has neutralized any claims of sovereignty by agreeing on preserving the continent for science. Another space of invisibility may refer to the unknown consequences that climate change has on the polar ecosystems. Invisibility can also be identified as a "technological sublime" characterised by its "dispassionate aesthetic engagement with mass destruction" (Yusoff 2005, p390).

The technological sublime described by Kathryn Yusoff is referring to the uncertainty announced by climate science. A region of invisibility emerges as a stain in an angle where uncertainty in science, the uncertain future of species and the spectre of war converge. Therefore, I argue and show that "polar site" is a production of these various spaces of invisibility depicted in the diagram. The attention of this research is to disarticulate these spaces of invisibility and offer

possibilities for new ways of seeing, thinking and feeling Antarctica.

The spaces of invisibility depicted in the diagram move attention towards aspects hidden behind the representation of Antarctica. These aspects relate Antarctica to colonization as the only "clean example" of colonizing (Dodds 2002, xviii), where nobody had to be murdered as it happened in other extensive areas of the planet. No indigenous population of its own offered resistance and there was no indigenous population that resisted the advancements of the colonization. However, and as Klaus Dodds remarks, this is a narrow view of colonization since it refutes processes of "'subjugation' of non-human" in the territory (Dodds 2006, p61).

For Dodds, Antarctica represents an opportunity to think about the "colonial present" (Dodds 2006, p59) that according to Derek Gregory, denotes a condition of post-colonialism that performs a continuity between the colonial past and the colonial present, responding to the existence of heterogeneous temporalities (Gregory 2004, p7). Antarctica and our conception and image of it is therefore a continuation of larger geopolitical endeavours, a penetration made 'by the imperial-colonial forces' from Europe (Chaturvedi in Dodds 2006, p59).

In addition, I will argue that aesthetic concepts such as the heroic age of exploration and the sublime also produce occlusions of Antarctica in that the concept of the sublime denies access to the actuality of it as a heterogeneous site of law, matter, and social and historical process.

1.2.2   The sublime

The concept of the sublime was rediscovered in the seventeenth century (1674) through the recuperation of manuscripts attributed to Longinus. According to Christine Battersby the original text was written "between the first and third centuries CE" (Battersby 2007, p4) and correspond to a treatise of rhetoric focused on the ability to convince and persuade an audience through speech. According to The Oxford Companion to Art the sublime came into general use in the eighteenth century as a new aesthetic term in contrast or different from the beautiful. The entry ascribes the greatest works on the subject to Burke (Philosophical Enquiry into the Origin of our Ideas of the Sublime and the Beautiful, 1775) and Kant (Critique of Judgement, 1790) which

stipulate the sublime as something attributed to nature as represented in agreement with the arts. Later conceptions of the sublime introduce feelings of terror in nature and "objects devoid of form" or impressions of limitless, thus setting the sublime in relation with the un-representable (Osborne 1970, p1112).

1.2.3   Pain and pleasure

Jean Francois Lyotard suggests to us that the simultaneous feelings of pleasure and anxiety associated with the sublime (Lyotard 1991) may have grown from the particular historical context of revolution within which Burke was writing. In Reflections on the Revolution in France (1790), Burke writing on the French revolution argues that "an irregular and convulsive movement may be necessary to get rid of irregular and convulsive disease" (Burke 1982, p109), namely the terror unleashed by revolution represents a kind of beauty of renewal. Notwithstanding this, he also condemns the rising in France as something barbaric as opposed to the constitutional and civilized order represented by the British constitution. As a royalist, Burke believed in private property and the orderly structure of institutions and as noted by Gregory Claeys, his views on human nature were pessimistic and sceptical, as the passions unleashed by revolution progress naturally from frailty to vice. Manners and civilization distinguished modern from barbaric societies, and depended crucially upon the spirit of the gentleman and nobility, owing nothing to the majority, whom Burke dismissed derisively as the "swinish multitude" (Claeys 2007, p20).

1.2.4   Mediation

For Claeys, Burke's views were conditioned by a sublimation of passions rather than rational constructions, whereby the sublime is experienced as a negative presentation of affect (Ibid.). Kant's observations on this focus on the cognitive forces of the subject, but he also makes references to war as a positive human force if carried out in an orderly way with respect to the individual. Terror and horror are therefore conceived as natural forces linked to the appreciation of war as a productive element of society, Kant makes war proportionally sublime to the dangers the warriors must face and opposed this to a long period of peace which may weaken society's values (Kant & Walker 2008, p122).

The idea of indistinct knowledge versus reflective knowledge (or the mob vs order) is further developed by Burke. Indistinct knowledge is a second-class form of judgement that is subordinated to the superior powers of reflection. Burke links it directly to the French revolution and the functioning of the General Assembly and he underlines this by pointing out that many of its members don't know how to read and to write (Burke 1982, p131). In contrast Burke supported the mediation of the powers on the monarchy and on parliament, calling it a "prescriptive right", freedom must be mediated by order and hierarchy. For Burke then the sublime is mediated by the senses and produces delight when it is distanced, represented and regulated and not immediate. In the contemporary moment we can argue this distancing of passion is crystallized in the problem of critical environmental changes instantiated by the Anthropogenic signature as collated in Antarctica.

One example of this mediating or distancing tendency in relation to the Anthropocene is the map of the RADARSAT Antarctic Mapping Project (NASA 2019). The image [Figure 1.3] aggregates a mosaic made of 45,000 satellite images which are standardized to the same visual values. For Yusoff the map floats "in a sea of darkness" directing a colonizing gaze "toward both Antarctica and outer space" (Yusoff 2005, p384). This particular distancing effect create regimes of viewing confirming the intention of the U.S. to have Antarctica as a model for space exploration. At the same time a fascination for disaster is created, as the view includes "the collapse of the Larsen B ice shelf, a document of global climate change" (Ibid., p382) terror and delight are conflated in a sublime representation of a global climatic disaster.

To summarize, we can argue that the Antarctic landscape is mediated by sublime representations that block us from the actuality of it as a site. This occurs via the aesthetic stories of heroism and polar martyrdom, as well as narratives of national grandeur, and the distancing effects of satellite imagery and imaging techniques. However, the unique configuration of Antarctic geophysics has inspired many artists to diffract the history of Antarctica with imaginary reworkings. What unique sensibilities emerge from engaging the modalities of the Antarctic landscape?

How can an engagement with the specificity of the polar-site enable us to conceive of different modalities of "site" or "landscape" in artistic responses to Antarctica? What performative, media and sonic art practices and methods are appropriate to achieve the above?

1.3   Defining terms: Polar landscape

In the following section, the work of artists exploring Antarctica will be reviewed in a way that explores ideas around objectivity, the regions historic geopolitical status, and its cultural and political imaginary as landscape as filtered through ideas of the sublime. The problem of access to nature that the sublime entails will be assessed against a number of artistic projects that reproduce the logic of the inaccessible or otherwise trespass the threshold of this type of distribution of the sensible.

1.3.1   Mapping Antarctica

Mapping was something inherent to the Antarctic landscape during the eighteenth and nineteenth centuries as a territory to be discovered and measured by a "colonizing gaze" (Yusoff 2005). However, despite the processes of science, accurate mapping proved impossible as the hardships of the territory problematized the continent's contours and borders. Even for contemporary satellites it is difficult to obtain a complete image because the South pole is always covered with heavy clouds.

Antarctica was named in reference to the Arctic as Antarktos, the anti-north (Greek: $\alpha\rho\kappa\tau\sigma\zeta$ arktos, the North), thus Antarctica has been named as opposite or indexical to the Arctic. Consequently, it has been argued the military occupation of the Arctic has been repeated in Antarctica (Dodds in Yusoff 2008*a*) as seen in the Sector Map [Figure 1.2] where Antarctica is represented as a sort of "Pie chart" (Glasberg 2012) or index of global power. The region is also considered an index for outer space exploration, with the recent discovery of bacteria in Don Juan Pond in the Dry Valleys employed as a proxy for how life might be discovered on Mars (Ballard in Marsching & Polli 2012, p170). Similarly, Antarctic glaciers are investigated as archives of an-

cient times and ice cores are curated as indices of the weather of the last glaciation.

An example of artistic work focused on the indexical representation of Antarctica are the photographic series of the New Zealander Anne Noble. She has been interested in the depiction of material culture in Antarctic bases and ideas of the heroic discovery. In White Shadow White Shine she explores the "ghosts history of Antarctica" where she references historic photographs, its past history of heroic exploration but blurs, darkens and alters their visual form to make them feel ambiguous in a way that echo a distant narrative. Additionally, as Ian Wedde argues, Noble's photographs go beyond a focus on the heroic but rather deal with the phenomena of perception as "her pictures of Antarctica are not about Antarctica at all [but] about consciousness" (Wedde in Noble et al. 2011, p101). Perception, as we shall see later, is one of the issues raised by artists working in the Antarctic field.

Tim Ingold describes landscape in terms of the "interlocking of cycles" (Ingold 2000, p193) and the emergence of the embodied mind in the activity of walking and writing the landscape. However, to some extent a phenomenological approach to Antarctica offers tensions if considering the problem of perception as it has been described by William Fox, as Antarctic geophysical conditions of the landscape have a tendency to produce mirages, and other extreme body-mind states. For this reason claims Fox, Antarctica is unmappable and to some extent unknowable, therefore producing the same question, is it possible to represent Antarctica if our perception is compromised? (Fox 2011)

The problem of embodied perception echoes in Antarctic art as shown in Dry Valleys (2008), where media artist Andrea Polli, records her embodied experience of the Antarctic landscape. During a six week residency at McMurdo polar base in Antarctica, she conducted interviews with scientists and recorded a soundscape of her visit to the Dry Valleys. In her documentary Ground Truth she notes that the scientists often spoke of the advantages of the human body over sensing technologies as a way to detect weather patterns, noting the importance of the embodied experience as a way of understanding the Antarctic landscape (Marsching & Polli 2012, p102).

Polli derives her ideas on embodiment from Paul Dourish and Nigel Thrift as a "phenomena that expand in space over time like conversations and mutually engaged actions" (Ibid., p96). She develops the idea of "affective data" through sonification of Antarctic landscape (Ibid., p100). Through this work she formulates the body as weather stations in which the human mind is able to combine data modelling simulations with lived experience.

Another example of affective data is seen in Katie Paterson's *Vatnajokull (the sound of)* (2007) which uses a wireless hydrophone placed inside an Arctic glacier connected to a mobile network. Users are invited to "phone the glacier" and have direct access to the sound of its melting ice. While the artwork enables an affective connection between the user and the melting Icelandic glacier, arguably it is contested that the telephone enabled an intimate space (Ibid., p232). It is also noted that the work makes an inadvertent connection between data and transnational capital as it was funded by Virgin mobile with the transnational corporation acting as a mediator of such intimacy, thereby blurring the boundaries between art and advertising.

 For the moment we will return to the heroic period of Antarctic exploration. The impossibility of accessing nature enunciated by Kant can be recognized in the physical martyrdom associated in the conquest of the South pole. It created a teleology whereby Antarctica was an unknown place that existed for men to conquer as an act of heroic self-realization in colonial service to a higher ideal or monarch. However, Antarctica is not limited to the colonial representation. For example, its inaccessibility is also related to the question of the alien, of how can we know something if our perception fails in the encounter? We can argue that this failure was felt by the heroic Antarctic explorers as articulated in Scott's diary:

> The storm shows no sign of abatement and its character is as unpleasant as ever.
> The promise of last night died away about 3 A.M. when the temperature and wind
> rose again, and things reverted to the old conditions. I can find no sign of an end,
> and all of us agree that it is utterly impossible to move. Resignation to misfortune is
> the only attitude, but not an easy one to adopt. It seems undeserved where plans
> were well laid and so nearly crowned with a first success. I cannot see that any
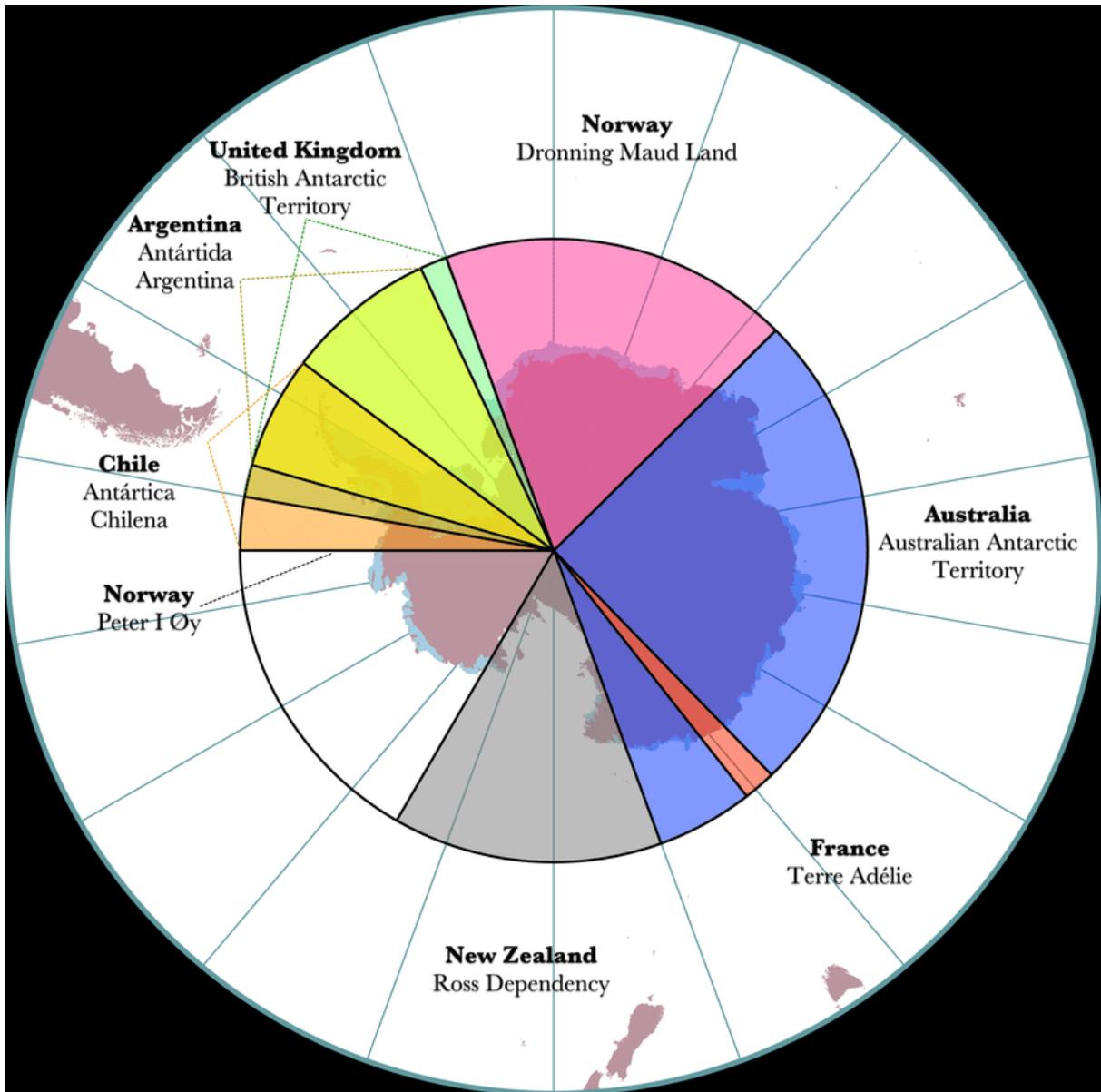
Figure 1.2: Sector map showing national claims of soveregnity (Thompson 2017)
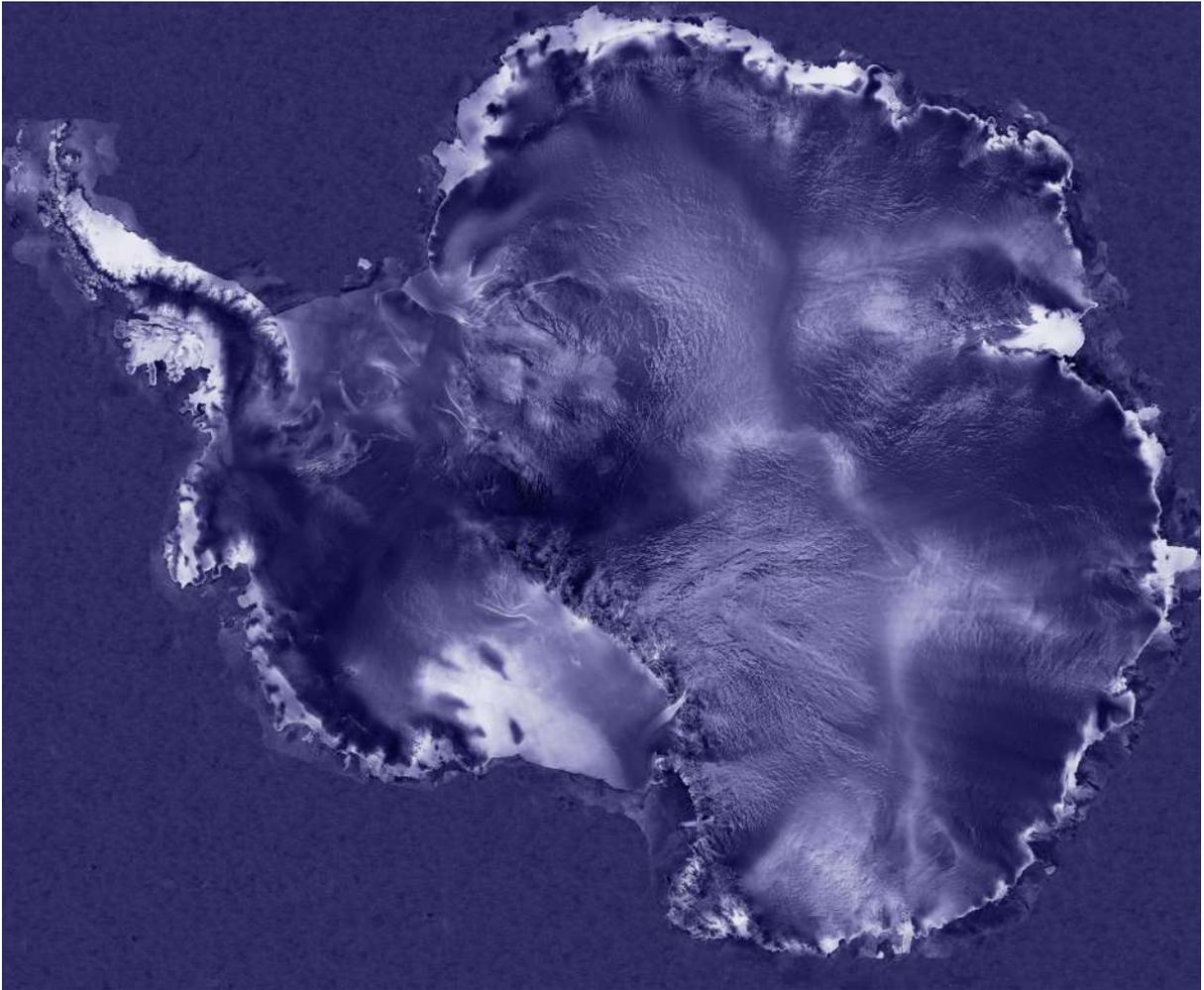
Figure 1.3: RAMP, RADARSAT map (NASA 2019)

plan would be altered if it were to do again, the margin for bad weather was ample according to all experience, and this stormy December – our finest month – is a thing that the most cautious organiser might not have been prepared to encounter (Scott 2019, p21-23).

As noted by Yusoff (2007) the historic polar representations of heroism, depicted in the photographs of Herbert Ponting and Frank Hurley do not manifest the effect that Antarctic landscape produced on the bodies of explorers as pain is absent. They also fail to capture the phenomena of "white-out" where the snow disperses and dim light makes it impossible to see your own body or the person in front of you (Fox 2011, p1). Our historic memory of the continent is therefore both formed and obscured by the stories of heroic representation that ignore the particular cognitive and perceptual issues faced by immersion in the polar landscape. Indeed the mapping of Antarctica was only accomplished in the 1960s, when radio echo soundings were performed during the International Polar Year (IPY) determining that it was one solid continent under the ice. It may be argued that the visual regime failed to attribute totality to such an inscrutable landscape, visual representation was insufficient or perhaps it was, on the contrary, excessive for the accomplishment of objective geography. Commenting on the phenomena of optical illusions, the artist Rachel Weiss suggests, "in Antarctica, these illusions are of such scale and frequency that they deserve to share the appellation "real" with non-illusory events" (Weiss 1984). It was only through an aural regime of frequencies (of the radio echo soundings) and through cold-war science and logistics since the radio echo soundings were developed as a technology to track ballistic missiles (Naylor et al. 2008), that it was possible to render such a fragmented landscape as an objectified totality.

The laws governing Antarctica re-make it as an "exclusive club" as can be seen in the representations derived from the legal infrastructure of the International Treaty System as seen in the previously discussed sectorial map. In the RADARSAT Map [Figure 1.3], Antarctica floats in empty space referring more to outer space than to any nation (Yusoff 2005) and Elena Glasberg suggests comparing the Antarctic Circumpolar Current map with the Sector map which divides the continent according to sovereignty claims. As opposed to the "exclusive group" produced

by the sector map, the Antarctic Convergence refers to the geophysical presence of Antarctica as a water zone. In such terms Glasberg describes an "Ontology of Ice" as an affect in relation to the Antarctic Convergence whose geophysical characteristics elicit an affect. She notes, "the Antarctic Convergence is impossible to place precisely" as a zone of water (Glasberg 2012, p8). She relates the "Ontology of Ice" to a trend in cultural studies known as "the Oceanic turn", that contests for "the decentering of humans" (Ibid., p131) brings the focus to Antarctic materials, using the poem by Chilean poet Pablo Neruda Piedras Antarticas, "Antarctic Stones" originally published in 1961 that praises the loneliness of such an uninhabited landscape that is animated by the liveliness of wind and ice. The "Oceanic Turn" is also involved in a critique against disciplinary boundaries imposed by the expanding colonialism of a "maritime culture". Inscribed in the "Oceanic Turn", the "Ontology of Ice" emanates presence not only from its singular characteristics but also from the technologies of capture and representation that become part of that singularity, as in the artwork of Tom Corby and Gavin Baily, the Southern Ocean is data. Thus, "the Ontology of Ice" is of a mixed nature, biotic, technological and of a geophysical form. It may as well be argued that "the Ontology of Ice" is geopolitical.

The phenomena of white-out, characteristic of Antarctic landscape, may entail a "black-out" as well, as discussed by Glasberg, referring to the "networks of secrecy" [1] surrounding Antarctica. Antarctica was a site of nuclear energy going under the name of "Operation Deep Freeze", that involved the installation and removal after nine years of a portable atomic unit. The PM-3A (1964-1973) standing for "Portable Medium Power" was also known under the name of "Nukey Poo" indicating the number of reported malfunctions, (438, including nuclear leakage). The last polluted soils of it were removed in 1976 (Wilkes & Mann n.d.) while the last "AWS" Automated Weather Station powered by nuclear fuel was removed only in 1996 (Lazzara et al. 2012). The black-out might also be set in relation to what Stephen Pyne recognised as "information sink", in parallel with the ability of Antarctica to cool the oceans or to be a temperature sink (Pyne 2016).

The black-out of information recreates the problem of the sublime of what is not possible to

---

[1]Networks of secrecy, a concept investigated by artist and geographer Trevor Paglen.

know through secret government activity. The imperceptible is then ontological and not only phenomenological. It is not only a matter of the senses but of the "pathos of knowledge" (not wanting to say, saying without saying, refusing to hear and not wanting to know) (Rancière 2007).

Antarctica is portrayed as a body of data with moving geophysical borders in other attempts that map the Antarctic Circumpolar Current. In *The Southern Ocean Studies* Tom Corby in collaboration with Gavin Baily, Jonathan Mackenzie and the British Antarctic Survey (BAS) attempts to demonstrate an "affective dimension" of data of representations of large datasets of "environmental complexity" (Corby in Marsching & Polli 2012, p239). These representations are indexical to the processes found in the environment such as "feedback mechanisms and the modulations of eco-logical interaction" (Ibid.). A work like *The Southern Ocean Studies* (2009) is exemplary since it is using data "on the fly" from sensors in the Southern Ocean and climate models using large ecological datasets some of them "specific to the dynamic of the Antarctic Circumpolar Current". The work merges different sources of data that mediate and translate the Southern Ocean currents, temperature and biodiversity and even though the work is not limited to the scientific context and purpose and furthermore pursues to "develop a sensibility to the dynamics of ecological complexity as pattern and felt experience rather than quantity and measure" (Ibid.). The ontology of Antarctica emerges from such encounters with data, in an aesthetic of systemness. Similarly in Kantian metaphysics, access to nature is not possible but only through a supersensible faculty. Consequently, it may be argued that in this work Antarctica emerges as a mathematical ontology of sublime experience. As Stephen J. Pyne describes:

> The Southern ocean it is the great vortex and heat sink of the worlds ocean, (...) The Southern Ocean works like a slow centrifugal pump that mixes the major oceans of the globe and supplies out of its peculiar ices the bottom waters which layer the abyssal plains of the Pacific, Atlantic and Indian Oceans (Pyne 2016, p33).

The currents, protect the "structural integrity" of Antarctica and "ultimately produce the albedo effect of the region" (Corby in Marsching & Polli 2012, p246). *The Southern Ocean Studies* uses the OCCAM data set, and mixtures of models and data sources, e.g. the "models used by the Intergovernmental Panel on Climate Change (IPCC)" (Ibid., p248), based on sophisticated

equations to study the physical laws producing the climate. In addition to these, other parameters "based on observational data" were set to interact in the depiction of the Southern Ocean: "biotic, chemical and physical parameters (...) arising from material data in the field" and additional live data to the work including salinity, temperature and other ecosystem information such as acidity streamed via sensors from the Southern Ocean". The geophysical elements, material and biotic are translated into the "behavioural and ecological character of installations". What we see in the large size projections are visualizations of trajectories that sometimes are supplemented with the incorporation of other data including "flickering constellations of geobiotic form and intricate lattices of polar wind" (Ibid.).

In a recent installation of the work in the Ambika P3 Gallery in London, it was possible to see a large projection of the visualization together with the data in a printed format. Data corresponded to the visualization or at least to a snapshot of it. Each data node was printed along with its geographical marker. Displayed over tables in stacks of paper, the installation affirms the materiality of the data that is printed. The stacks of paper were set on the tables occupying 1/8th of the surface space of the gallery that is a tall, huge industrial space. A light was illuminating them, suggesting a focus. The materiality of the printed data evidence weight as opposed to the light virtuality of the predominantly white projection. The disposition of the stacks of paper count as an indexical form of the piece. The stacks of data seemed to work as evidence, a non-site representation of Antarctica where the rendered visualization creates Antarctica as a data field.

Corby argues for a "systemness" (Ibid., p249), an affect emerging from the system's dynamics and of the particular interactions of the ecological systems depicted as well as those established once thrown into the data pool of visualization, for example, the public. A character emerges, a type of presence is what the aesthetic representation attempts to emanate. A "machinic ecology" (Guattari 2005), a concept brought into being by Felix Guattari to indicate non-human arrangements that nonetheless instantiate affect through the interlocking cycles of its binding ecologies. The representation renders an entity that is geophysical, biotic and informational, perhaps, what Elena Glasberg describes as "becoming polar" (Glasberg 2012, p131), using a "Deleuzian" ter-

minology to denote the varying condition, the transient being polar, an ontology that traverses ontologies, that is not only data and not the only environment but also is geopolitics. For her, "becoming polar" is something particular to places under "environmental pressure" that has been "polarized" and depicted as "pure" in order "to be devastated; simplified only to be ruined by intervention" (Ibid., p132).
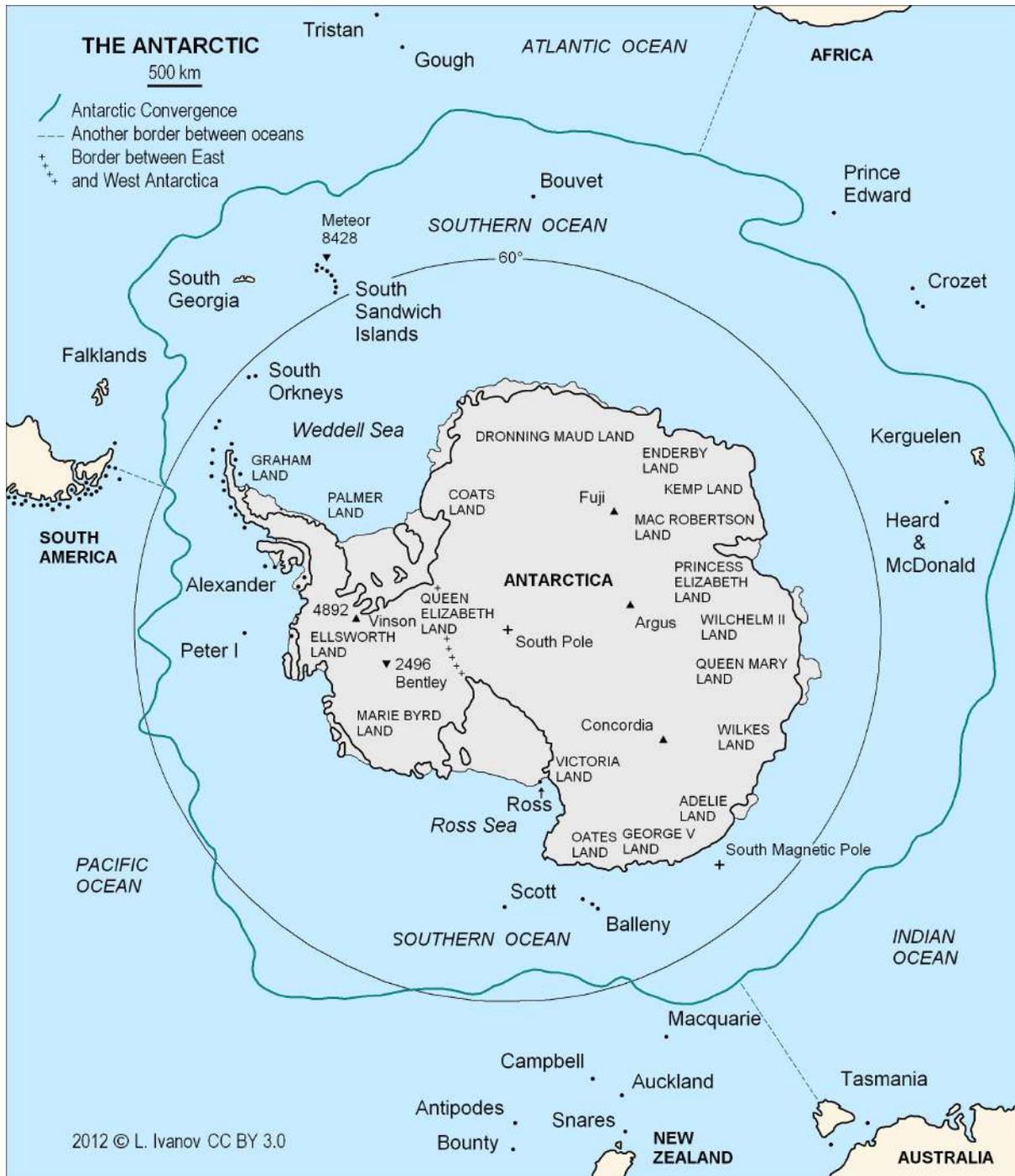
Figure 1.4: Map of the Antarctic Convergence (Ivanov & Ivanova 2014)

Figure 1.5: Military patch of PM-3A crew

1.3.2   The mathematical sublime

I would like to focus on the affective dimension of data acknowledged by Tom Corby that refers to what was described by Kant as the mathematical sublime, a moment in the aesthetic judgement of the sublime feeling. The feeling of the sublime is determined by the "aesthetic reflective power of judgment" (Kant & Walker 2008, p100). Kant divides the analytic of the sublime in two, one mathematical and one dynamic. The first moment of an aesthetic judgment is related to "quantity". The feeling of the sublime involves a "mental agitation connected to the judging of the object" (Ibid., p101), an agitation that may be similar to "a vibration" (Ibid., p115), a rapid alteration between attraction and repulsion (Ibid.). This agitation relates to the capacity for judgment of the object that is recognized as a "subjective purposiveness", referred to by the imagination to either "the cognitive power" or the "power of desire" (Ibid., p101). This implies that the feeling of the sublime refers to an attunement of the mind, regardless of the object that stimulated the subjective responses. The first agitation is of a mathematical kind, the second is called "dynamical" and both are attributed to the object as being "sublime in these two ways" (Ibid., p101). The mathematical sublime refers to the power of judgment to estimate magnitude through concepts that are numerical; these estimations insofar as they are intuitive, are aesthetic (Ibid., p251). The sublime seems to be connected for Kant to the "presentation of quantity". The idea of the sublime is related to what is absolutely large (Ibid., p103) and to an estimation of magnitude of natural things. Kant distinguishes an estimation of magnitude which is numerical and thus mathematical and one estimation that is intuitive or aesthetic concluding that ultimately the estimation of magnitude in nature is aesthetic (Ibid., p107). In the estimation of magnitude, the imagination "performs the combination [Zusammensetzung] that is required to present a magnitude" (Ibid., p110). The mind performs a composite. As the imagination progresses towards infinity it must provide the schema for the understanding in order to guide the progression by means of numerical concepts (Ibid.).

Lyotard explores the sensations of the Kantian sublime asserting that the feeling of the sublime does not result so much from "the greatness in number" but of the progression, that is, the intuitive knowledge of progressing magnitude, and "the progression towards the always greater

which is felt as sublime" (Lyotard 1994, p112). A magnitude that "is not numerable by recurrent addition of a unit of itself" (Ibid., p113). Jacques Derrida speaks of "the collosal" in The truth in painting: "Erhaben, the sublime, is not only high, elevated, nor even very elevated. Very high, absolutely high, higher than any comparable height, more than comparative, a size not measurable in height, the sublime is superelevation beyond itself (Derrida 1987, p124)." According to Lyotard for Kant the sublime is considered a "mathematical synthesis" (Lyotard 1994, p98). Objects perceived as having "insurmountable limits in the extension of its actual intuition" (Ibid., p101). The intuitive failure of comprehending magnitude elicits the emotion of the sublime. Lyotard interprets the sublime as the drama of the imagination whose intuitive measure is exceeded. The sublime appears to arise from such a "fundamental threshold" (Ibid.).

Kant's Critique of Judgment may be recalled to compare the idea of "systemness", of the affect associated to technological ecologies, with that of supersensible reason. Similarly Eugene Thacker describes the aesthetic experience of swarms, recalling the distinction made by Kant of two types of numbers, "a non-human number with no limit" and an "embodied, aesthetic number whose limit is subjective apprehension itself" (CTheory.net 2019). In Thacker's interpretation of Kant, the subject "sinks back" after experiencing the failure between apprehension and comprehension, between two types of numbers "thereby gaining a certain distance" (Ibid.) that allows a sense of measure of that failure. For Kant the sublime arrives through the arousal of the supersensible faculty, of the ability to realize such failure of the imagination, confirming the superiority of men over nature.

It may be worth thinking about the representations of Antarctica closely related to climate change. The focus upon uncertainty of the Anthropocene's interpretation of Antarctica renders a focus on a magnitude that casts a shadow over a geopolitical problem, that of latent war. The representations focused only on the phenomenon are oblivious of the geopolitical dimensions. These contemporary forms of art may be considered aesthetic responses to politics of knowledge and information in the sense Rancière argues about distributions of knowledge and orders of representation in Sophocles' Oedipus, a "certain order of relations of what can be said and

what can be seen" and "a certain order of relations between knowledge and action" (Rancière 2009, p17-18). As a consequence, the visible is restrained to the manifest and cannot present itself as itself.

Rancière describes the intertwining of two logics, one having to do with the forms that take the relationship between presence and absence that correspond to regimes of artistic representation. The second relates to the images themselves and its forms of imitation. The interrelation of these two processes has a very distinctive effect, that of transforming the problem of representative distance into the problem of the impossibility of representation. To disentangle these two logics he distinguishes between aesthesis and poiesis. The first defined as "an economy of affects" and the second as "a way of making" (Rancière 2007, p112). He takes as an example the problem of representation of Sophocles' Oedipus exposed by French dramatist Corneille, as the impossibility to represent due mainly to the excess of vision (Oedipus's gouged eyes), excess of information (too many oracles) and the lack of a romantic plot.

This discussion in Rancière's text exhibit some aspects that are relevant to the question of representation of Antarctica that is under the influence of climate change disaster and an excess of data. Thus, the embodiment that Elena Glasberg and artists like Andrea Polli, Tom Corby and Gavin Baily, or Katy Paterson use, even if exploring embodiment, through binaural listening, data modelling, wireless telephony and remote sensing, refer to virtuality. It is something that is not possible to represent and what we have is the testimony of data, sensors, networks. Technology as a witness of the body of currents, sensors were there in the ocean but the data gathered from them is not the ocean.

1.3.3   The witness narrative

The Antarctic bridge (1980) and *Salon for the South Pole* (1982) are works by Rachel Weiss, scrutinizing the notion of Antarctica as an idealized form. She utilizes projections of cartographic images, maps and images to develop her idea of the Antarctic territory, as a series of contested overlapping spaces, representative of different histories, places and scientific claims. Her ap-

proach is visual and spatial, and her representation enhances invisible aspects of Antarctic landscape, such as the magnetic South Pole. She describes a universal problem, the nature of the poles, emphasizing the existence of Antarctica as an ideal concept pertaining to Greek ideas about symmetry and purity of form, stressing the impossibility of the search for an absolute South. Her installation work suggests geography as a salon, a dialogue of performative geography.

We might speculate that this work argues that in Antarctica the concept of geography is always ambiguous a "sleight of hand¨ and impossible to pin down. This landscape is a moving configuration of global politics on (the) ice, buffered by the katabatic winds,"the flying seas" was the name given to the blizzards blowing from the South Pole" (Yusoff 2008*b*, p9). The impossibility that Weiss points to refers to the plurality of possibilities, of superimposing territorial claims, thus in this case impossibility does not refer to an absence but to a heterogeneous complexity.

Rancière identifies in the sublime a "witness" narrative as a new form of art" (Rancière 2007, p111), this is not so much about telling a story or describing an event but about "witnessing about a there was' that exceeds thought". He recognises that the ability to exceed thought does not belong only to the thing in question but to the "there was" in itself. This effect of images alluded to by Rancière is related to the origin of these images and its destination which as a problem is also reflected in Rachel Weiss's work. She describes the problem as "troubled perception" while witnessing a tension between the three different poles projected on the map in the gallery space and "the necessity of an axial centre" that she relates to a platonic tradition of thought that imagined Antarctica as complying with the philosophy of symmetry. Such a troubled perception mentioned by Weiss might be associated to the "representative distance" that Rancière claims is taken as the impossibility to represent.

The freezing of the claims of sovereignty in Antarctica creates a witness, we are here but it belongs to nobody as in *the Southern Ocean Studies* where the sensors are the witness of the oceanic current, as they mediate its visualization. The witness affect has been considered as

one of the characteristics of the sublime feeling (Rancière 2007). It is a narrative that implies a separation, between the observer and the observed, it implies objectivity, a virtue not easily achieved in rarefied environments.

The awareness of the limitations of perception against extreme geophysical conditions seemingly operates within the Kantian sublime. The mind becomes the subject of the conditions of hardship, for those trying to make sense of landscape. Here is the explorer Sir Douglas Mawson, his companion Xavier Mertz has passed away after a delirious journey across the Beardmore Glacier:

> For hours I lay in the bag, rolling over in my mind all that lay behind and the chance of the future. I seemed to stand alone on the wide shores of the world and what a short step to enter the unknown future! My physical condition was such that I felt I might collapse in a moment. The gnawing in the stomach had developed there a permanent weakness, so that it was not possible to hold myself up in certain positions. Several of my toes commenced to blacken and fester near the tips and the nails worked loose (Mawson 1915, p168).

1.3.4   Walking Antarctica

Fox describes in *Walking in Circles, Cognition and Science in High Places* (Fox in Cosgrove & Della Dora 2008), peculiar conditions proper of isotropic space or a space that looks the same in all directions. Commenting on the case of volcanoes, of walking in circles inside the crater rim as in Mount Erebus on Ross Island, Antarctica. All the perceptual laws are broken and inevitably the experience is that of being lost "to walk somewhere and yet get to nowhere" (Ibid., p20). As the crater rim is circular the beginning is quickly absorbed by the walk. The absence of other physical landmarks make it difficult to situate one's location, "our natural navigational abilities begin to fail", because of a missing sense of scale (Ibid., p20,24). We feel lost precisely because "there is no sense of squaring off with the landscape" (Ibid., p24). Is the landscape a phenomenon that may be attributed to the activity of mapping? To Fox, the Antarctic landscape is so isotropic that "even that supreme cultural extension of our neurophysiology" collapses (Ibid., p21).

Vast territories and unique conditions of visibility make the Antarctic landscape rarefied for perception. What happens when the practice of walking is summoned up with disorientation? Disorientation and walking was for Henry David Thoreau a practice altogether, of walking into the unknown as a way to disturb the relations of object-hood.

The landscape is a practice of walking to the unknown in Walking (1851) (Thoreau 2006). The landscape is not something fixated but more a phenomenon appearing as the walker walks into unknown realms. Thoreau, the precursor of phenomenology aligned his walking with an activist perspective in which he questioned the separation between subject and object.

Doreen Massey alludes to an experience of landscape mediated by topologies that appear contiguous: "The touched, smelled and heard proximate material world is thereby woven into the walker's sensory field, leading him or her to experience the landscape as a topological realm of contiguous places (Massey 2013, p84)." How can the walker experience a realm of contiguous places where all contiguous places look the same? Is Antarctica a landscape devoid of places? What William Fox contends is that when our perceptual abilities are compromised it "becomes essential to deploy cultural means such as cartography" (Fox in Cosgrove & Della Dora 2008, p20). The idea that landscape emerges through the process of walking (in)to the unknown may be brought in to think of the Antarctic landscape, as a place where binocular vision is rarefied. Disorientation is a feature of this landscape.

In *Sur. A Summary Report of the Yelcho Expedition to the Antarctic, 1909-1910* by Ursula K. Le Guin (Guin 1984), a group of South American women travel to Antarctica in a secret anonymous expedition organized by a group of friends. They inhabit Antarctica during Austral Spring and Summer dismissing the settlements left by previous male expeditions. Theirs was a secret non-heroic expedition that followed the most documented areas of Antarctica in the nineteenth century. They carved their camp in the ice in concentric worm tubes around a stove that they had carried along together with hay, and dried fruits to survive the winter. They named the places in

their base site and on the way to the South Pole after places in their home cities, a glacier was "La Pampa", the centre of their igloo construction was called "Buenos Aires". They explore and leave no traces when arriving at the South Pole, to not upset the following future heroes. Their mode of dwelling is particular of their kind of travelling, adventurous and non-heroic, with the "simple ambition of go and see" (Ibid., p267). How is the Antarctic landscape in the eyes of Le Guin? A landscape emerging out of the relation between women that combine a "goal limited to exploration and observation" (Ibid.), play and taking care of each other and future visitors and seemingly practice a focus on invisibility, as they left no footprints even (Ibid., p284), remain anonymous, show no intention of publishing the report (Ibid., p265) promise not to tell anyone. Theirs is a performative geography of invisibility.

Le Guin argues against one of the aspects of Antarctica's paradigm of representation, that of heroism, introducing a gender element[2]. Antarctica is a place for "utopic visions", argues Yusoff (Yusoff 2008*b*, p62). Heroism is put into question and contrasted with the freedom of anonymity in *Sur*. The expedition would not have leaders unless facing an urgent danger:

> if a situation of such urgent danger that one voice must be obeyed without present question, the unenviable honour of speaking with that voice should first fall upon myself: if I was incapacitated, upon Carlota: if she, then upon Berta. We three were toasted as 'Supreme Inca', 'La Araucana', and 'The Third Mate' (Guin 1984, p269).

But instead, they celebrated that the roles were never executed, they worked together without any need of "orders given by anybody" (Ibid.).

Le Guin introduces various alternative variations to the imperial route of Antarctica. They are nine women, they are vegans, they are South American, Chileans, Peruvians and Argentinians, they depart from Chile on a "Chilean Government boat, Yelcho", supported by a secret benefactor from Valparaiso (Ibid., p265,268). They describe daily details, as their food or their periods, they considered their diet as one of the factors responsible for their success "I am sure that the

---

[2]One notorious absence of this thesis is Mary Shelley's Frankenstein (1818). This work has not been included in this review since it is considered as operating in the sublime register and represents problems derived from the sublime aesthetics, the monster, the inhuman and the thought without a body.

fifteen per cent of dried fruits in our pemmican helped prevent scurvy; and the potatoes, frozen and dried according to an ancient Andean Indian method, were very nourishing yet very light and compact – perfect sledging rations" (Ibid., p276). According to Elena Glasberg, Sur by Le Guin challenges the dominant role model of the experience of Antarctica (Glasberg 2012, p225) and the anonymous narrator declares it boldly:

> The backside of heroism is often rather sad; women and servants know that (...) achievement is smaller than men think. What is large is the sky, the Earth, the soul. They made their boat to be anchored in Arrival Bay as they "went ashore in the ship's boat". When they touched the ground they described familiar feelings "I felt elation, impatience, gratitude, awe, familiarity. I felt I was home at last" (Ibid., p271).

Their narrative contrasts with heroic descriptions that are alluded to here as "melodramas and minstrel shows in the long winter night" (Guin 1984, p272). Ursula Le Guin confronts the heroic paradigm with a narrative trope, "time travelling". Through time travelling, the story is devised as an overlapping territory to the official-male dominated, heroic landscape of Antarctica. *Sur* was originally written in 1982 as a short story published in The New Yorker. Through a literary device, Le Guin makes the protagonists meet for the first time in Punta Arenas in August 1909 (Ibid., p268). They "planned to sail West to the Ross Sea, which Captain Scott had explored and described, and from which the brave Ernest Shackleton had returned only the previous autumn " (Ibid., p270). They go to Antarctica on board the Yelcho (Ibid.), a boat that under the command of Captain Luis Pardo rescued Shackleton's Trans-Antarctic Expedition in 1916. Time travelling is the narrative trope that renders *Sur* possible.

The walking to the unknown is rewritten by expeditionary walking, an activity where the unknown is subsumed in heroism and depicted in heroic pictures. However, as Yusoff argues, pain is not visible in the pictures, which do not offer a complete index of the landscape, the pictures do not correspond to that kind of "punctum", of pain from frostbite or blinded vision from overexposure. "Antarctica presents itself on and through the body beyond representation, as a place unresolved and potentially unmappable (Yusoff 2007, p220)".

If the geographies of pain might be visible they might correlate with the material geography at every instant, but these geographies remain silent. Instead, the body is depicted in the pictures as Shackleton's phrase "a body in battle", strained, overwhelmed, marked. Antarctic landscape imposes thresholds of "bodily fragmentation". Yusoff argues that excess might be a "method-ological recuperation" "that disrupts the heroic narrative of a contained and purposeful body in the landscape" (Ibid.). Her analysis of the tragic Australasian expedition of Mawson (1911-1914) where an agonizing Mertz offers a perception of the landscape where the body is expelled and collapses in dissolution. The diaries of expedition describe on the contrary:

> the attempt to preserve the integrity of the body, to keep warm, to maintain sanity,
> to detect the distinction between the real and hallucination, to keep moving forward,
> to keep coming, to be present, in time and not to be frozen, absorbed, erased or
> distracted from the essential meaninglessness of the journey (Ibid., p228).

Explorers according to Yusoff were confronted with the tension between marking the landscape and being marked (by wounds, madness and loss), that "locates the explorer at the threshold of representation and place" (Ibid., p218). Representation then may be seen as a reworking of the contradiction of being in an unmappable place. Excess, for her may act as a recuperation, as Mawson, stripping himself bare naked in the middle of the Antarctic plane, to be comforted by sunlight, declaring himself as a sun worshipper, for Yusoff, it was a Bataillean reaction that for Mawson meant the construction of place (and perhaps his salvation) as a "non-productive approach" to landscape exposure.

Excess may be comprehended within a performative understanding of landscape. Excess is purposeless but active, it transforms reality. Mawson, living the abnormal experience, that of be-ing wounded by frostbite and overcoming it through the anomalous experience of direct contact with the sun. The body in pain being touched by the sun makes landscape emerge.

Tim Ingold relates this to a notion of landscape as "a sort of remembering" of the embedded meanings codified through experience onto the environment. From his phenomenological per-spective landscape appears as an unfolding of relations where there is no interior or exterior.

The landscape is experienced through walking, through immersion within it. Landscape as performed implies the impossibility of apprehending landscape as a whole or as something seen from a singular perspective. This can be framed within a phenomenological approach that operates as a critique of objective accounts of nature, landscape or experience.

For Ingold landscape is related to the dwelling. And there are different sorts of dwellings, that of the hunter, that of the archaeologist (Ingold 2000, p190), that of a group of scientists, that of the heroic expeditionary or that of a group of women that go anonymously on an expedition as in the case of Le Guin's *Sur*. The landscape is perceived in movement or in some dynamic activity of grasping for it, like for instance, remembering, writing or walking. Thus, the landscape is a phenomenological experience, one that is produced as a lived experience.

Ingold understands landscape as an embodiment of a "series of interlocking cycles, which builds itself into the forms of the landscape" (Ibid., p193). It includes all cycles associated with an organism. Ingold understands the organism plus the environment as one indivisible totality. The landscape is experienced within, the form is emergent in the life process. The mind and landscape are interwoven. Ingold cites Whitehead to express his agreement with his conception of mind as "creative advancement to novelty". For Ingold mind is "the cutting edge" of a life process. In this way, cultural forms would be encoded in the landscape, and the landscape would be constituted by a record and a testimony, thus the landscape may be understood as a story and as a chronicle.

Mapping for Tim Ingold occurs in a process of system of differences, where one is mapped onto another system of differences. From one plane of ideas to a plane of physical substance. A landscape occurs as an interlocking of processes, thus a sentient ecology emanates presence from a pre-objective and pre-ethical stance. Take Mawson as an example, his own experience of excess giving him the means to inhabit an unmappable landscape. Place as inhabited landscape emerges in the case of the explorer as a dwelling of excess.

Would it be possible to assert that hallucination is a productive psychic reconstruction of place? Might hallucination be a sort of dwelling?

1.4 The ecofeminist perspective

I suggest we analyse the work of artists and theoreticians doing work about Antarctica within an ecofeminist framework. Ecofeminism may be understood as an ethic that deals with the oppression of women and nature and the comprehension of women and nature as powerful forces. At the same time it advocates for the suppression of all kinds of domination since the domination of nature stems from the domination of men on men. "Philosopher Karen Warren's ethics of care and Australian philosopher Val Plumwood's "ecosocial feminism" are likewise built on a fundamental critique of hierarchies in society and dualism in thought" (Merchant 2012, p207). These key characteristics of ecofeminism may be set in motion to observe the practice of artists that reformulate in their methodologies the lack of access to Antarctica.

In *Pages from the Book of the Unknown Explorer*(2008-2012), Judit Hersko investigates affective data rising from non-existent and speculative data. She combines narrative, photography and pH indicator dye (Bromocresol Green) as well as silicon casts to represent fictionally the life of the first female Antarctic explorer, Anna Schwartz, a photographer and naturalist who supposedly travelled with Byrd in 1939 and is the mother of the artist. She combines scientific techniques to develop an art of awareness: the story leads to the investigation of Dr Victoria Fabry on the endangered Antarctic planktonic species, the Clione Antarctica (microscopic sea snail) and the Limacina Helicina (microscopic sea butterfly).

Hersko, employs an ample range of devices to deploy an alternative history of Antarctica. She travels in time and mixes real data with fictional data. Similarly, Antarctic landscape renders a myriad of perceptual paradoxes. Polar landscape as material geography contest the foundations of geographical knowledge, the objectivity of vision, of geographical truths and of borders and forms.

In Climates of Sight, Mistaken Visibilities, Mirages and 'Seeing Beyond' in Antarctica (Yusoff 2008*b*), Kathryn Yusoff explores cartographic failures, through the voyages of Charles Wilkes, his failed attempt to reach the Antarctic continent and the speculative geographies he and his crew contrived.

> His concentration on becoming the Antarctic Columbus, on finding the land Captain Cook had failed to sight, made him jumpy...His diary entries during these weeks of searching fog and dodging icebergs indicate that he was a victim of what modern authorities name as polar depression (Henderson in Yusoff 2008*b*, p2).

A distinct "climate of sight" is an essential attribute [that include] "iceblink, exposure, superior mirages, mock suns, phantom displacements, blindings, refractions, auroras and strange weather" (Yusoff 2008*b*, p8). Yusoff also reflects on antarctic mirages, "The mirage most strongly demonstrated the latent possibility of a 'geographical gift' to the normative European history of perception (Yusoff 2008*b*, p5)". Then she recalls the concept of "climate of sight" mentioning Robert Smithson, who had written: "[The] "prevailing conditions of one's psyche" affecting "how [one] views art" "The climate of sight changes from wet to dry and from dry to wet according to one's mental weather" (Smithson & Flam 1996, p108-109)". Yusoff suggests, in her reading of Wilke's expedition, that a particular "climate of sight" deriving from physical phenomena such as Antarctic mirages. She proposes to understand them not as optical illusions, but as "real phenomena of atmospheric optics caused by rays bending in air layers with steep thermal gradients" (Yusoff 2008*b*, p51). Refraction occurs "when light rays pass through air layers of different temperatures, they curve towards the cooler air" (Ibid.). The fact that the mirage is a displaced image, that it appears in a different location to where it was expected, does not make it a false image but, according to the author "an image in the wrong place" (Ibid.). Yusoff criticizes the idea of true geographical positions and advocates for the validity of the refracted image. "A superior mirage means that there is an inverted image above an erect one, hence the image is lifted above the horizon, "intervals of time bring land into view when it is very far below the horizon" (Ibid.)".

Anne Noble portrays the white-out phenomena in a series of homonym photographs. However,

as it was said before, her images not only refer to the visual phenomena but call back on the perceiver, on the specific kind of conscience the material landscape elicits. Antarctica renders a particular "climate of sight" from its mirages, refractions and anomalous weather. It becomes singular in its direct access to deep time through its geology populated with meteorites and its glaciology that engages with an archive of deep time scales. Antarctica also renders a particular "climate of sight" from the turmoil surrounding the geopolitics of fossil fuels.

In *British Petroleum Map* (2005) by Anne Noble she explores the possibility of Antarctica as the major reservoir of fossil fuels. Using the picture of an old game board released by British Petroleum displaying over a map of Antarctica, the routes BP may implement over the territory if the ban protecting extraction of natural resources would be revoked. In the case of Noble, Antarctica is revealed as a latent "world target" (Glasberg 2011, p232).

Elena Glasberg brings to further analysis the work of three female artists, Anne Noble, Connie Samaras and Marina Zurkow to demonstrate artistic methodologies that reinvent Antarctic landscape. She presents them to argue for: "various ways artists create data where there is none or it is somehow controversial or even suppressed in order to counter the post-heroic scientific structuring of Antarctica (Glasberg 2011, p237)".

Elena Glasberg argues that Noble's use of "rephotography" (Ibid.), or a photograph of an existing photograph, in the case of the original game board rediscovered by the artist "in a forgotten archive at New Zealand's Canterbury Museum" (Ibid., p225), is similar to time-travelling, the retroactive action that Ursula Le Guin performs in *Sur*, is a "recuperative act of possibility" (Ibid., p232).

In the installation *White Shadow White Shine* (2013), Anne Noble displays images on the walls of an apparent domestic ambience of bright orange walls. A worn sofa and empty clothes hangers, aligned hanging on each other on two rows. Rephotographs are set on the walls as familiar domestic ornaments. The pictures show Scott's fatal expedition, a phantom-like face and the

tent where the three explorers died. Also it shows a picture taken from the internet, of Mount's Erebus crash of the sight-seeing aeroplane where 257 people died in 1979. She uses these photographic devices to recreate a sense of place that in Antarctica has been constructed through the heroic experience. The memories of Erebus and of the deadly expedition of Scott returning from the South Pole. Histories of heroism, sacrifice and of the cruelty of nature.

Connie Samaras seems to work with this ambivalence and with the gap left by missing data (information). In *South Pole Antennae Field* (2005), the angle of the image, as well as the use of white-out from a natural feature to an expressive regime, and the visible post-human shadows leave an interstice open to speculations. Part of a series called VALIS, an acronym taken from a novel by Philip K. Dick, corresponding to Vast Active Living Intelligence System, this work suggests the incorporation of an extra-terrestrial reading of the landscape that becomes a place for post-human inhabiting. Her picture performs a mapping of the potential forces that are triggered by a gaze that doesn't end in a literal reading. By leaving open the possibility of interpretation or the ambivalence left unresolved, the framework of the image expands. Glasberg describes her work in this image as a process of giving in to white-out (Glasberg 2012, 120).

Glasberg interprets the presence of disconnected footprints on the ice in Le Guin's *Sur* as non-human sequences (Ibid., p235). The footprints are material traces of the heroes, Shackleton and his crew's "last autumn" whose trace was kept frozen in the Antarctic ice. The disconnected footprints go nowhere. Glasberg continues, making a parallel between the heroic western history of Antarctica and the post-heroic art of the Anthropocene. In both cases, Antarctica is imagined as a kind of wreckage. Can Antarctica be engaged otherwise?

1.5   Ontologies of ice

As noted by Yusoff, the hallucinatory nature of experience in Antarctica leads to cartographic failures. A distinct "climate of sight" emerges in interaction with the landscape including "iceblink, exposure, superior mirages, mock suns, phantom displacements, blindings, refractions, auroras

and strange weather" (Yusoff 2008*a*, p8)(Yusoff 2008b, p8). She develops the term"climate of sight" from Robert Smithson, who had written: "the climate of sight changes from wet to dry and from dry to wet according to one's mental weather" (Smithson & Flam 1996, p108-109), namely that's how one feels affects how we comprehend what is in front of us. In her reading of Wilke's expedition she also argues that these hallucinogenic forms are also material external conditions "real phenomena of atmospheric optics caused by rays bending in air layers with steep thermal gradients" (Yusoff 2008*a*, p51)(Yusoff 2008b, p51). The fact that the mirage appears in a different location to where it was expected, does not make it a false or purely mental condition but, according to the author "an image in the wrong place" (Ibid.). In doing so, Yusoff casts doubt on the idea of true geographical location and advocates for the validity of different understandings of geographical precision.

Elena Glasberg brings to further analysis the work of three female artists, Anne Noble, Connie Samaras and Marina Zurkow to demonstrate artistic methodologies that reinvent Antarctic landscape. She argues that these artists find ways to develop different kinds of data resources that are distinct from scientific information in ways that enable alternative voicings and representations of the region. As we have seen Antarctica renders a particular "climate of sight" from its mirages, refractions and anomalous weather. It also is singular in its direct access to deep time through its geology populated with meteorites, and its glaciology that engages with an archive of deep time ice cores and a connecting history related to the geopolitics of fossil fuels. In *British Petroleum Map* (2005), Anne Noble explores fossil fuels by re-photographing an old game board released by British Petroleum (BP) which shows how the company would exploit the region if the international ban on natural resource extraction were lifted. Glasberg describes the game being formally similar to a 'target' with the region entirely conceived as a latent resource ripe for extraction (Glasberg 2011, p232). She also notes that the board game was rediscovered by the artist in archives at New Zealand's Canterbury Museum, and this historical revisiting develops a similar methodology of time-travelling to that employed by Ursula Le in Sur, as it is a "recuperative act of possibility" (Ibid., p232).

Returning to Le Guin's, Sur, Glasberg notes how her women in the story encounter ruin and abandoned detritus on the travels throughout the continent. At Scott's base camp they fine frozen litter, empty cans, broken windows. One of the women suggests setting the base on fire (Guin 1984, p272). We can interpret this perhaps as a symbolic gesture through which to end the history of heroic representation in the region.

1.6   Interrupting the spectacle

It may be worth thinking about contemporary art's sublime representations of Antarctica closely related to the representations of climate change. The focus on uncertainty of the Anthropocene's interpretation of Antarctica renders a focus on a magnitude that casts a shadow over a geopolitical problem. These contemporary forms of art may be considered aesthetic responses to politics of knowledge and information in the sense Jacques Ranciére argues about distributions of knowledge and orders of representation in Sophocles's Oedipus, a "certain order of relations of what can be said and what can be seen" and "a certain order of relations between knowledge and action" (Rancière 2009, p17-18). As a consequence, the visible is restrained to the manifest and cannot present itself as itself.

The photographic series of Anne Noble represent the simulacrum of Antarctic experience, through a series where the subject is the representation of Antarctica in tourism and science parks. She also revised the traditional representations of Antarctica and she re-photographed the photographs of the heroic era. But what is she really doing? Wedde argues that she calls back on our perception (Wedde in Noble et al. 2011, p101), instead of depicting the unrepresentable we may think that she diffracts it, making visible the simulacrum.

The unrepresentable is part of the Antarctic simulacrum, Anne Noble's *Iceblink* (Noble et al. 2011) portrays the Antarctic simulacrum. A series of photographs in a cruise ship to Antarctica and in Asiatic science museums, showing us the materiality of the tourism infrastructure of Antarctica. The photographs are of bright plain colours, showing the bare surfaces, unpolished

corners in murals representing some Antarctic environment, or shiny plastic penguins in museum shops. These are minor perceptions that make evident the Antarctic simulacrum, tourism and its paralysis.

Representation is prone to sequential fictional arrangements argues Rancière. The interpretation of Pierre Huyghe's in *A Journey that wasn't* spoke of a capacity of Antarctica, of being virtual while articulating its mode of existence, manifested in the transduction of signals, light signals, frequency signals that informed the map and the territory and the passage from the desire to reality and also from hypothesis to discovery. Huyghe announces the engagement with invisible cartography, through sound beacons and the existence of Antarctica in the domain of frequencies. And a special machine "to translate the island's shape into a complex sequence of sound and light", in this sense it may be thought that the spectral coordinates were creating the island.

From another perspective, Ursula Le Guin devises *Sur* as a geography of invisibility, that extends the virtuality of Antarctica beyond the reach of colonial dreams of possession. Virtuality is enabled by fiction. Thus, it is possible to argue that Antarctica has seen many forms of practices of fiction in literature but also in the use of fictionalized data. The works by Andrea Polli and Tom Corby are about fictionalising data, Polli combines audification of data with soundscapes and interviews, she argues that this is to create a sense of place, which can lead us to think that fiction is to create place, just like it was previously shown in the descriptions of Le Guin's *Sur*. Fictionalized data is also produced by Tom Corby's *Southern Ocean Studies* in his mixing of non-human as well as human presences, as sometimes his installation work shows the presence of people sensed in the gallery space to be mixed with the moving currents of the Southern Ocean. In this case, fiction is embodied as moving trajectories.

However, the main trajectory that has shaped the Antarctic landscape is the centrifugal expansion of European imperialism. This expansion has also taken the form of fictionalized data, as the logic behind the representation of Antarctica. On one side it imposed rational separation

and on the other the sublime aesthetic.

> above all the concept of the sublime polar region skewed and distorted by creating
> a seemingly fresh location for colonial fantasy apart from Asia and Africa while ex-
> tending orientalism to native populations; by emptying the landscape of any marks
> of the ways it was clearly inhabited by natives and instead envisioning it as proving
> ground for imperial conquering or as wasteland. (...) the sublime made available the
> polar regions to Anglo-European use and appropriation (Bloom & Glasberg 2011,
> p121).

A performative geography may fit best to count for the instability of borders in Antarctica. In *Antarctic 1: Views along Antarctica's First Highway* (2002) an exhibition issued by the Center for Land Use Interpretation in Los Angeles and in the writer William Fox's description of Antarctic 1, a 2.5 mile distribution road from Robert F. Scott's "discovery hut", past airport and seaport through McMurdo's industrial waste to New Zealand's Scott base. Through photographs by several photographers that spent time recently in Antarctica like Stuart Klipper, Josh Landis, Anne Noble and Ty Milford with captions by Fox, a route is made on the gravel road "that travels through McMurdo logistics centre in Antarctica". The photographs show the infrastructure that the primary contractor, one of the U.S's largest defence companies Raytheon, provides to the National Science Foundation. The pictures show as well the Crary Laboratory, "the principal research facility in McMurdo" where research is conducted in the fields of glaciology, geophysics, marine and terrestrial biology, geology climatology and vulcanology. "A live webcam feed from the crater rim of Mt. Erebus, a nearby active volcano, is visible on the hallway screen". William Fox [3]created the exhibit to show the small city of McMurdo in the most remote of places, to interpret the landscape in terms of its uses, as the framework of the CLUI emphasizes. The exhibition, a joint production of the CLUI Polar program and the Independent Interpreter program show a small city of 1200 inhabitants at its peak, where "generators burn jet fuel (which doesn't freeze) in order to produce electricity for the base and to provide hot antifreeze that provides heating for the buildings".

---

[3]William Fox is an independent writer and researcher, specialized in Land Art, he is Director of the Center for Art + Environment at the Nevada Museum of Art in Reno and "has spent several periods investigating Antarctica, in particular, cognition and perception in seemingly empty places" (*The Center for Land Use Interpretation* 2019)

For Rachel Weiss, Antarctica may be represented by "the hoax", "[Antarctica] is at once so un-real, so elemental and so unimaginable" (Weiss in Marsching & Polli 2012, p86). The hoax would replace literality by incorporating strangeness. For example as in the work of Pierre Huyghe *A Journey that Wasn't* (2005) that Weiss uses to illustrate her argument. In her article, a video-still of this work dominates with intense orange of all-weather gear, a group of, presumably scientists, working on something out of the frame. In the article published in ArtForum, the journey of Pierre Huyghe and his collaborators to Antarctica to investigate rumours of a strange white animal is discussed.

For this purpose Huyghe and his companions establish an inflatable research station "to pro-duce aural and light-based images of the island where it was based". He explains how the station had to be abandoned due to dangerous conditions and that the members of the team had "an encounter" with the animal. The enactment of an evocative action is performed by the artist and his team, he leads an operation of mapping through his performative piece that involved the aural regime of frequencies to depict a parallel dimension. The ambivalence of science is made visible through the hoax, that as Weiss contends, devises distance from the subject, breaking the possibility of a literal reading. Thus, an oblique reading is suggested, non-literal, tangential. It is not clear whether the event has taken place in the domain of frequencies or in virtuality as the creature "reveals itself to a sound beacon placed on an ice flow in an apparently inhabited territory". The expedition aims to contact the albino penguin living in a parallel world of black ice; "to document a perilous journey into sublime ecology" where they finally arrived "to a landscape without matter, only light", a science fiction (Ballard in Marsching & Polli 2012, p181).

The work of Pierre Huyghe, *A Journey That Wasn't* is exemplary of the interruption of the spec-tacle that is also taken into consideration by Rachel Weiss's analysis of this work who called it "the hoax" (Weiss in Marsching & Polli 2012, p87), a device that interrupts representation. This interruption of the spectacle may be associated with the "radical uncanniness" a concept by Jacques Rancière that Kathryn Yusoff recalls describing artistic practices in the context of

Antarctica (Yusoff 2008*b*, p17). The un-representability of Antarctica has also been engaged by Kathryn Yusoff, and at the same time, she offers a methodology to enable access to the lack of borders. This methodology of excess (Yusoff 2007), inspired in what exceeds the photographic registration of heroic exploration, pain, madness, hallucination, all phenomena grounded in the body in its relation with what artist Jean de Pomereau names as the "embodiment of absence" (De Pomereau in Yusoff 2008*a*, p90).

The Anthropocene claims the production of the "geological present" in the Anthropogenic signature, for example in the production of the Ozone hole (Denizen in Turpin 2014, p31,33). The geological present demands for an engagment with models of practice that take on the ambiguity and the lacking of borders as the opportunity for multiple responses and representations, instead of claiming the impossibility to represent the ever-changing ontologies such as Antarctica, Climate change or the Pacific Garbage Patch.

My work, seeks to address the need for multi-range methods to access Antarctica as a cultural subject. In the same sense Sarah Whatmore reflects about the necessity of complementing the humanities:

> [And to] supplement the familiar repertoire of humanist methods that rely on generating talk and text, with experimental practices that amplify other sensory, bodily and affective registers and extend the company and modality of what constitutes a research subject (Whatmore 2006, p607).

The proposal of this investigation is to mediate the Antarctic landscape with a site, or a non-site, correspondingly. The site as a configuration of different entities will respond to the encounter with the Antarctic landscape. The site of investigation will include different types of bodies and technological configurations, a "sentient ecology" (Ingold 2000, p25,189) or an "ecology of practices" (Stengers in Yusoff 2008*b*, p16) that will respond to the Antarctic landscape. The site is then performed as an embodied aesthetic response to Antarctica.

Chapter 2

Research Methods

2.1   Introduction

In previous sections, I have described Antarctica in narratives of heroic explorations and as a polar-site. Through the arrangement of elements that various artists have devised to interact with the geophysical ontology of Antarctica, with its fluidity, the lack of borders and its influence far beyond its geographical limits.

The body of work I will present in this chapter is a methodology to access Antarctica through the production of a polar-site. In this section where I will present the methodology of this research in practice, I will contest that the practice of hacking enables aesthetic access to Antarctica through the use and combination of observation and measuring agencies (agential cuts) and through the combination of three vectors of analysis, geopolitics, science and environment to invoke the site of study (i.e. polar-sites).

I will present work where diverse ontologies were used as proxies. This is considered a multi-species epistemology to enable access to Antarctica. Since in Kantian metaphysics, access is used to indicate a relation to judgement, the production of knowledge is enabled through hashes of hacking practices. Proxies were used to mediate the relation with the polar-site through its own not-accessing or not knowing, through growth patternings, through infection, fermentation

and other "names of action", measurement agencies and agential cuts. The hacking practices that will be described include an ample range of devices, including, sensors, text and biological cultures and responses.

It is necessary to come back to Immanuel Kant and to his notion of imperceptible as that which is not possible to know as it will be contested that the hacking practices enable oscillations of accessing and not accessing the polar-site. I will bring this idea further as to link it to Digital Signal Processing since it enforces an alternation of ones and zeroes enabled by the physicality of a continuous 5 Volt signal. The concept of polar-site is of particular relevance, indicating a relation between Antarctica and the Arctic and also to all other "poles". In this sense, the taxonomy presented by Cosgrove and Della Dora in *High Places* (Cosgrove & Della Dora 2008) [1] is used and expanded, widening the scope of the field work that has been realized in Antarctica to subpolar regions, high altitudes, borderlines, urban peripheries, deserts and all that is not perceptible or it is not possible to know because of a lack of access. This lack of access may also refer to phenomenological and ontological conditions. The works or "hacks" discussed here are the series of field works and site-specific performances, Sound Cartography (2009-2017), the series of non-site forays such as the sound installation Antarctica 1961-1996 (2017), and the series of performative explorations of the site of polar pollution such as the visits to the sewage water pond in Lordship Recreation Ground in Broadwater Farm, Tottenham, London.

As it has been explained in other sections of this thesis, Antarctica renders a particular perceptual configuration that demands methods that may perform embodied responses to geophysical systems. The series of performative explorations as it will be described in detail, implemented different modes of knowing, and have been identified generally as hacking devices and practices.

It will be argued that these modes of knowing are onto-epistemological forays, in the sense that the way of knowing is produced by the ontologies. The way of knowing is altered by the way of being. These ways of knowing are sometimes non-human as in the case of the Lactobacillus

---

[1] The Polar as isotropic, as high altitudes, as sacred places. To that categorization it is proposed to include the geopolitical borders, the peripheries of cities and polluted sites.

or the yeast cultures as modes of not-knowing.

The model this research in practice is developing is engaging with computer science and software studies[2] in terms of the utilization of lists as a method.The making of the list was a way to maintain sanity for the Antarctic explorers. In this respect, the geographer Kathryn Yusoff explains what was happening in the diary of Apsley Cherry Garrand,

> The text of *The Worst Journey in the World*[3] constantly highlights the compulsion towards bodily dissolution; the attempt to preserve the integrity of the body: to keep warm; to maintain sanity; to detect the distinction between the real and the hallucinatory; to keep moving forward, to keep consuming; to be present in time and not to be frozen, absorbed, erased, or distracted from the essential meaninglessness of the journey (Yusoff 2007).

The meaning of a list to check while making the journey may be seen as a tool, a sort of technology that has an affective character as that of maintaining rationality. It may be worth looking at the definition of a list as "a fundamental way of classifying and ordering information" (Adam in Fuller et al. 2008, p174).

In computing, Alison Adams asserts that a list is referring to "a data structure that is an ordered group of entities" (Ibid.). In her description of lists, she points out that as data structures they refer to an ample cultural tradition and in general may be comprehended as "a form of knowledge representation that can free knowledge from the limitation of having to be passed down" (Ibid.). In addition, she recalls the "earliest evidence of written language in the form of lists" in "the cuneiform tablets from around the second millennium BC" (Ibid.).

The list as a data structure is present since early history and was used as a technology of time, in

---

[2]This research in practice is engaging with software studies in terms of the development of a "computational aesthetics", in the sense that some computational methods (Neumann et al. 2005) deploy the aesthetics presented through the works as relations of forces are expressed through data structures. As Beatrice Fazi and Matthew Fuller contend, "We understand computation as a method and a force of organization , quantification and rationalization of reality by logico-mathematical means" (Fazi & Fuller 2016, p32)

[3]*The Worst Journey in the World* is a memoir text by Apsley Cherry Garrand (Cherry-Garrard 1922) of Robert Falcon Scott's expedition.

the sense of being able to give information in a future context. It may also be seen as a technology of remote control and by means of this related to military strategies such as tele-controlled missiles. Despite the relation of lists to control technologies, the use of such a structure in the context of this research lists, may be related to a heterogeneous form of defining a determined subject. This is illustrated in Donna Haraway's Modest‗Witness@Second‗Millennium.FemaleMan‗ Meets‗OncoMouse: Feminism and Technoscience (Haraway & Goodeve 2018), in her style she describes "technobiopower" as made of "informatics, biologics and economics- about the kinship of the chip, gene, seed, bomb, lineage, ecosystem and database" (Ibid., p2). As well she refers to the main themes of technoscience in the last quarter of the twentieth century, such as "military needs, academic research, commercial development, democracy, access to knowledge, standardization, globalization and wealth" (Ibid., p8). We may as well argue that her heterogeneous descriptions respond to one of her most important claims, that social relationships are equally heterogeneous and that the ontologies that play on these relationships are of a different nature as "they include non-humans as well as humans as socially (or, what is the same thing for this odd congeries, socio-technically) active partners" (Ibid.). She claims that the offspring of technoscience and capitalistic accumulation are the Cyborgs that are described through another list as "the end-of-the-millennium-seed, chip, gene, database, bomb, fetus, race, brain and ecosystem" (Ibid., p12). They are informed by an implosion of subject and objects and of nature and artifice (Ibid.). The "technoscientific womb" she asserts is of a reproductive character as she identifies "only four horns" giving another list,

1. The apparatuses of twentieth-century military conflicts, embedded in repeated world wars; decades of cold war; nuclear weapons and their institutional matrix in strategic planning, endless scenario production, and simulations in think tanks such as RAND (...)

2. The apparatuses of hypercapitalist market traffic and flexible accumulation strategies.

3. The apparatuses of production of that technoscientific planetary habitat space called the ecosystem.

4. The apparatuses of production of globalized, extraterrestrial, everyday conscious-

ness in the planetary pandemic of multisite, multimedia, multispecies, multicultural, cyborgian entertainment events such as Star Trek, Blade Runner, Terminator, Alien, and their proliferating sequelae in the daily information stream, embedded in transnational, U.S.- dominated, broad-spectrum media conglomerates, such as those forged by the mergers of Time-Warner with CNN and of Disney universe with Capital Cities, owner of CBS (Gabilondo 1991 and Sofia 1992 in Haraway 1997, p12-13).

The lists used by Donna Haraway may be interpreted as tools and approaches to deal with the complexity of the world we live in. The management of complexity through lists may be understood as a coherent form of structuring heterogenous modes of being. We can distinguish two types of lists, one that is sequential and one that is relational.

A list as a sequence is a "constructor type" where the series of elements is of an unknown number and the type of elements is of the same kind (Bal & Grune 1994, p43). However, I have realized many times especially in the realization of the fieldwork that the type of agencies performed are data structures. The visited sites were converted into a signature, a simplified set of coordinate points. I have re-mixed nature in this action of sampling the environment. I have called them measurement agencies, and performed these arrangements of technologies and practices every time, e.g. I have used a sensor unit, that gave me values that I stored in software arrays. I have used my own body as (a site of) pain, infection and vertigo; I have worked with and through photography, pH detection, text permutation, image to sound conversion, fermentation. Thus, the signature was performed with these measurement agencies, the geographies involved include sites in subpolar areas, high altitudes and extreme environments, also in cases of extreme pollution. These sites have served to implement experimental designs, through human and non-human measurement agencies applied to investigate the production of polar-site or the problem of imperceptibility in Antarctica.

The type most often used was a sequence where the index is not exclusive to one value or in other words, the items cannot be addressed linearly by means of one index type, as the index may call many elements of the list. This type of "associative array" (Ibid.) or hash is the

most common form of data-structure used in this research. These data structures are pools of data values, producing relations amongst its elements as well as operations and agencies that may be performed on these values. Hashing requires a structure that provides the means to map the values into a data structure and a management of "collisions" (Stephens 2013). These mappings relate one domain to another (Ibid.). These structures enable new relations since it is possible to open up and map new data directly to arrays (Ibid.). When mapping each record to the hash space, data records with different values may have the same hashing output and therefore can be mapped to the same spot and result in a collision. Collisions are inevitable if there are more data records than hashing spots (Chi & Zhu 2017, p11). A hash function is a mathematical function that maps keys to integers (Skiena 1998). A hashing algorithm is used to efficiently search or identify duplicates, and to achieve rapid data lookup in data retrieval and encryption techniques. One of its variants is perceptual hashing, that uses color histograms and other coefficients of image blocks "as perceptual features" in the composition of a "robust hash" (Jie 2013). "Image perceptual hashing, also known as image robust hashing, is defined as mapping images to a short bit string following the human perception (Ibid.)". Following the psychology of perception, brightness is the main attribute of an image[4].

> The key idea of hashing is to represent a large object (be it a key, a string, or a substring) using a single number. The goal is a representation of the large object by an entity that can be manipulated in constant time, such that it is relatively unlikely that two different large objects map to the same value (Skiena 1998, p92).

This technique uses the appearance of the media object and "it is robust against various digital manipulation[s]" (Gharde et al. 2018, p30816). The type of hashing that this research uses is comparable to the image perceptual hashing method. This is the case of the sonifications rendered from the photographs of the visited sites, which are generated from the relations of brightness and contrast of the image. This method follows a perceptual model of hashing through by obtaining the luma pattern of images that are signatures of the site.

---

[4]The research of cognitive psychology and human visual systems show that the sensitivity of eyes to chroma signal is much weaker than to luminance signal, and that brightness is the main features of the image signal (Jie 2013)

The sites have served to implement experimental designs, through human and non-human measurement agencies and have been applied to investigate Antarctica through the many problems associated with the production of imperceptibility. Many artists have devised methods that have overcome imperceptibility and the lack of access to extreme nature and geopolitical concealment, these methods may be set out as follows:

Time travelling (LeGuin, Huyghe)

Collaborations between art and sciences (Polli, Corby)

Use of sensing devices for non-scientific means (Huyghe, Hersko, Corby)

Cartography and mapping (LeGuin, Poe, Corby)

Speculative fabulation (Noble, Huyghe, Hersko, Zurkow)

Dismantlement of truth and knowledge, end of simulacrum (Noble, Hersko, Zurkow)

Re-photography (Noble)

The art works reviewed in the contextual review chapter lack the combining of the three axes of geopolitics, environment and science (see diagram in Chapter 1 page 16), and are identified as producing Antarctic imperceptibility as I have presented it in the first section of this thesis. The axis of the environment, science and geopolitics are engaged by different artists working in the Antarctic field or in the polar-sites. They usually engage with one of the axes or a combination of two but they do not combine the three vectors.

Throughout the different approaches I have argued that the way of knowing site alters its production and that the practice of hacking enables the introduction of diffraction as the main method. Hacking enables the superposition of ontologies and their epistemologies, leading to novel knowledge, governance and territories. Hacking enables the production of a site, that in the frame of this investigation is polar-site. I will be relating the production of site or non-site to intra-action and the diffraction gratings described by Karen Barad (Barad 2007).

The diffraction gratings consists of an apparatus or "material configuration that gives rise to the superposition of waves" (Ibid., p81). They became emblematic of "the mysteries" of quantum physics, because of the "so called two-slit experiment" (Ibid., p73). Richard Feynmann the Nobel laureate physicist said of these experiment that is "a phenomenon (...) impossible to explain in any classical way" (Ibid). For Barad this diffraction apparatuses that serve to study difference and interference, reveal and make evident the "entangled structure" of the "ontology of the world"."Diffraction gratings are instruments that produce patterns that mark differences in the relative characters (i.e., amplitude and phase) of individual waves as they combine (Ibid., p81)"

In the work *Antarctica 1961-1986* (2016), different fragments of the investigation, such as scientific papers, video documentation and field recordings are combined for the installation. The contiguity of the different fragments seeks to enable a superposition. It has been observed how transient frontiers appear, such as where a conductive thread and a Theremin sensor was used to enable interaction between the sounds and its listeners, in this sense interactivity becomes site or rather, non-site. But where is the border between this thread and the bodies of the visitors of the installation? Non-site is produced thus, interactivity is intra-activity instead.

The access to concealed conditions belonging to a particular moment is an old surrealist idea that is recalled by Henri Lefebvre while characterizing a unitary project to account for space. Lefebvre describes a sequence from L'Amour fou by Andre Breton and observes that Surrealism "sought to decode inner space and illuminate the nature of the transition from subjective space to the material realm of the body and the outside world" (Lefebvre 1991, p18). Breton browses with the blade of a knife through the pages of a book, having decided previously where to focus his gaze, while he is asking whether he will be able to meet his lover (Ibid.). Consequently, the works I have described probe the moment from various perspectives, in frequency ranges, in permuted text, diffracted text, software, site specific work, performances and biological cultures. These concealed conditions of site are imperceptible and they may be considered as the unconscious of (a) site. The unconscious of site may be considered a form of not-knowing.

The operation of performing site involves the creation of site, the definition of a hash of elements that will constitute (a) site. Site is considered then as a declaration. Site is created to be able to study it, which as a problem may be paralleled to what has been described as one of the problems of contemporary science, acknowledged as the effect of the experimental design over the studied problem and as the effect of the observer over the observed. As it has been described in the contextual review of this thesis, site is a concept that reinforces the productive character of art as it devises locales and leaves visible the infrastructure that is part of its production.

2.1.1 Hashing

The hash data structure may be implemented as a hash function that will partition data across clusters. These processes enable the distribution of shard collections into chunks. The sharding operation creates the initial chunks dependent on the configuration of the chunk size. Hash tables can be implemented in any programming language, they are used in compilers, databases, cryptography, caching and associative arrays. A hash function is used to compute an index into an array.

I have used hashes of hacking practices. These are indexed by my aim to measure the polarsite. Hashing is a discursive practice coming from the ethos of computer science. It is related to producing space e.g. a cypto-space and/or a digital space, and in this case, a polar-site. Hashes of hacking practices are producing the site, within the superposition of the ontologies and their epystemologies, the combination of observation and measuring agencies produce site. The hash of hacking practices combines modes of knowing, alternating the human, the yeast, the mineral, the virus and the digital. The hash function assigns a signature to the items. The hash of hacking practices provides a signature to the site of study.

We may argue that the representation of data rendered by a digital sensor is a translation in logical terms of continuous phenomena, providing electronic parameters i.e. the definition of dis-

turbance as continuous variations of voltage sampled with a determinate frequency rate, transforming continuous values into discrete values, continuous changes to binary or hexadecimal representations allowing for the sensing of the world to take place within matrices of zeros and ones. While different, the responses indicated in biological cultures may be considered silent speech as it is not possible to know if the biological culture knows the world. However, there is evidence that it is accessing the world, as we may see changes in growth, colour, density and incorporation of elements of the world e.g. oxygen or hydrogen molecules inside bubbles of carbon dioxide in fermentation processes. These processes, such as fermentation may be considered as forms of not-knowing.

Fermentation as an aesthetic response (and a measuring agency)

How is yeast fermentation constituting an aesthetic response to the problem of Antarctica? How is this approach incorporating a multi-dimensional scope that integrates geopolitics, science and the environment? And how is this approach disarticulating hierarchical narrations in favour of horizontality and a more-than-human, multi-species point of view?

> While displaying arrangements of modes of knowing. How does yeast know? If knowing is direct, outspoken language, or written words, can I at least access what yeast does not-know? Not knowing as the silent speech of minerals, silent speech as growth and crystallization (Research Diary, August, 2017).

In the series of photographs of Beer moulds as an aesthetic response, *Mould (2017)*, pictures were taken of moulds contaminating beer yeast agar plates. The patterns are considered aesthetic responses, since they change imperceptibly, responding to forces. A registration of these changes was documented using a macro lens and digital photography. They were made after experiments with yeast fermentation.

In the lecture performance *Yeast* (2016) I started using yeast as a performative media. I considered the capacity of yeast to incorporate the environment in bubbles of gases during fermentation. The yeast in fermentation moves towards the other and incorporates the environment, it illustrates a form of "not-knowing".

According to Bruno Latour, Louis Pasteur is looking for a definition of an ontology in the process of fermentation (Latour 1993). He is looking to prove the existence of yeast and this proof is developed through "degrees of being", coinciding with the progression of experimental affordances. The scientist modified the experimental apparatus in order to detect degrees of being.

In the same sense the study of site quickly shows paradoxes because the way of approaching the site alters the site itself, for example, if studying a polar-site with digital sensors, the rendered site will be of numerical representations, non-continuous, discrete and mediated phenomena, if the study of site is performed using the body or other bodies or organisms, the rendered site incorporates pain, bio-chemical reactions, changes of states and more-than-human responses.

2.1.2 Hacking

In the book Ontopolitics in the Anthropocene (Chandler 2018), David Chandler introduces to hacking the dimensions of labour, governance and ontology. The relation of the observer and observed determines the type of governance during the diffrerent periods of history. During modernity the relation was defined by mapping, and by sensing in correlational post modernism and to hacking as a new emerging kind of governance. He observes that an abandonment of subjectivity informs the development of neoliberalism as a consequence (Ibid., p60).

The other forms of governance, sensing and hacking, distance themselves from the subject alone, turning themselves towards "ontology" (Ibid.), "through the assemblage approach to the world as multiply constituted through the assemblage approach to the world as multiplying and constituted through differentiating chains of interaction (...)" (Ibid.). For Chandler, hacking is about creating new forms of governance, through the generation of novel types of knowledge that engage with "epistemological problems of perception and projection" (Ibid., p163). The problems of governance that hacking takes into account develop an awareness of "empirical entanglements" (Ibid.) and of those that are intertwined with the Anthropocene.

Hacking is distinctive as a mode of governance in that it seeks to emphasize the

creative and innovative possibilities and potentials of "life in the ruins": life after the modernist construction of the world. Rather than seeking to solve existing problems, hacking seeks to expand the potential for openness and experimentation. Therefore, for hacking, the means and the ends are the process itself, in its unfolding: there are no fixed goals external to the process and no community separate to it (Ibid., p164).

Consequently, life is not separated from hacking, for hacking embraces the potentiality of the present as "stretched out" or "intensified present" (Ibid., p165). This condition separates itself from the discovery model of science since it is not working with a "hidden potential within an entity or a system (as a virtual potential)" but in the present, the actual "of co-becoming or of material inter-relation (as an actual potential)" (Ibid.). This is interpreted by Chandler as an intensification of relationality in the sense Isabelle Stengers indicates on working on processes that are real and "not in protected experimental places" (Stengers in Chandler 2018, p177). In this sense hacking may be seen as a form of onto-politics.

We may argue that the practice of hacking unfolds in not intending to produce truth. Here truth is equated to results, products and commodities whereas the processes hereafter described are more related to reverse engineering than science. In this sense, the works describe the practice of back engineering as the process that is realized with the goal of determining what are the components of a certain product and how they interact with each other.

Hacking shares one crucial aspect with the feeling of the sublime - ambivalence. For some, hacking develops through fixing and destroying or through threat and challenge. However, it operates beyond the "awe", of implementation (Oliver et al. 2011). It is easier to take things apart than to put it back together reads the third rule of hacking (Collins 2006, p8). Hacking moves, it is processual, and "determines methods of influence" (Ibid.). It does not stop at discovery, it continues towards unfolding possible resolutions. Furthermore, in the critical engineering manifesto (Oliver et al. 2011) the black-box is engineered and it is pointed out that the engineered objects re-engineers its users, and they acknowledge influence as part of the design.

Hacking may be related to a particular system of coordinate points, the four freedoms of Free Software, freedom to use, study, share and improve the software. Hacking is a practice related to freedom, related to break into systems, and about "freeing the virtuality of information" (Wark 2004).

The notions of unblocking and of the black-box are related to hacking as it was mentioned by Clément Canonne at the conference Music Hacking: Instruments, Communities, Values 3 at IRCAM in Paris (Pellerin 2017). The action of trespassing the limits of the black-box, in order to render visible its concealed processes may be considered a common pattern in the hacker class. For Mckenzie Wark, this class invents the meeting of the subject and the object "in new forms of expression, rather than in the sad dance of unfulfilled lack" (Wark 2004).

The work here analyzed may be considered as a bricolage approach. The origin of the bricolage concept is in the first chapter of The Savage Mind (1968) by Claude Levi Strauss. In this text Levi-Strauss defines bricolage as "making do with whatever is at hand" (Lévi-Strauss 1968, p17). Objects are related to each other through "congruity" as they in some way go together (Ibid., p9). This congruity relies on the practice of creating collections for no apparent reason than doing (making) the collection itself (Ibid.). It is as if the bricoleur reunites disparate things so that they start to talk to each other. "It is the performance of a point of view" (Ibid.), the bricoleurs point of view is one that discovers the congruity amongst objects, many times assigning to it therapeutic properties. The practice of bricolage may sometimes resemble a scientific practice, but differing from it in purpose, specialization and how they both relate to contingency (Ibid., p17). Thus, the practice of bricolage is "heterogeneous" (Ibid.).

Being exhaustive at observing and making systematic cataloguing are also characteristics of the bricolage although the notion of purpose is not so relevant. The fact that it is rather a point of view, situates bricolage as a non-causalistic practice where there is no separation between the observer and the observed, the knowledge developed is thus displayed as a non-hierarchical

apparatus.

The technologies shared are submerged in the research for the imperceptible in Antarctica. Imperceptibility is the production of space and can be analysed using Karen Barad's elaboration as intra-acting, as the processes that constitute matter in the making. A hash of modes of knowing provides a variety of modalities to access the imperceptible. This problem is similar to the object of inquiry structured by Kant as the problem of access to nature, and for what he argued for and the impossibility of such an access. In this inquiry Kant allocates a structure where he makes a division between what is knowledge conceived as direct perception and what is aesthetic, as indirect, imprecise perception. If viewed under the light of the distribution of the sensible argued by Jacques Rancière this division may be seen as arbitrary. The modalities mentioned above rely on a non-hierarchical distribution that enable the access to nature based on the dismantlement of truth i.e., the distribution of knowledge and not-knowledge. In this sense the consideration of imprecise aesthetic knowledge as a low subject is overpassed and instead it will actively engage in the study of the production of imperceptibility as the insignificant.

The yeast fermentation on a Petri dish may be seen as a form of not-knowing; it is also an apparatus, in the sense that the activity performed together with the fermentation process, changes matter. This is visible in the bubbles and in the biochemical process triggered, that transforms sugar into carbon dioxide. It is also invisible as in the smell of fermentation, and as in the capturing and transformation of molecules, the molecules that constitute the bubble. It is invisible in other processes that are possible to "not-know" such as observing physical patterns. It may also be considered that these forms of not-knowing may be assessed by forms of knowing e.g. electronic microscopy to establish correspondences between the patterns (forms of not-knowing) and the molecular structures and bindings (forms of knowing). It may also be the case of using a digital Theremin sensor (form of knowing) to sense the changes in electronic capacitance (form of knowing) in the fermentation process (form of not-knowing).

Non-site

The works presented here operate outside the paradigm of discovery in the search for the imperceptible, since the focus is set on non-hierarchical approaches such as the use of error and the focus on the daily, the body, the mould or other insignificant aspects as randomized text, bodily infections, and body fluids. The approach will enable the displacement from the human perspective towards the more than human, automata, biological and geophysical and the displacement of a model of truth that allows for conceiving the imperceptible as the insignificant rather than the inaccessible.

The practice here presented is developing a "hybrid" approach to art-making about the site, a method has been developed, accounting for both the critical formations of the site and its material messiness. The method implies the recognition of imperceptibility as the production of space, where imperceptibility is considered in regards to the hegemonic "distribution of the sensible" that relegates matter to silent speech and to not-knowledge. Thus, imperceptibility may be regarded as the production of not-knowledge, or the production of the "silent speech" of matter. These works will be presented in the next chapter, Hierarchy.

Polar Pollution

The works that investigate polar pollution, exhibit the main questions raised in the research of the concept of the polar, and those to be performed in urban environments. This inquiry took the form of the study of a polluted site. In this sense, the pole as opposed to the centre corresponds to a periphery in the city. Periphery for example corresponds to zones of property speculation and to the dynamics that land acquisition imposes on the terrain, such as pollution, high volume noise, the commercial use of the land, modification of local dynamics in favour of the growth of property speculation.

The second source of this angle of research was advanced by travelling to geopolitical borders, between Chile and Argentina and Chile and Peru which was considered in direct relation to the study of the polar in deserted sites. These geopolitical borders were assimilated as polluted

because of the evidence of anti-personnel mines near the border and reports of the presence of poisonous metals in the sand and waters of the Atacama Desert. The geopolitical border and the periphery in cities share also some other characteristics in common with the poles, for example, to be under intense surveillance and to potentially manifest a struggle for the control of space. Opposed to the geopolitical border, the boundary on these sites is undefined and moving, the sands of the desert and the mining slag are blown from side to side by the wind. The moving sands are a moving border, as it was said of the Sahara Desert by Ursula Biemann (Biemann 2006).

The moving borders of a polluted site share this quality with Antarctica, for instance with the Antarctic convergence. In urban sites, the aerial effluvium of polluted water, exceeds the barrier planned by the urban design, and the animal plagues perform another border, always moving, just like the ice of Antarctica that increases and recedes, the same can be said of the currents surrounding it, a water zone and a border that makes Antarctica a moving geography for some.

In order to reach the periphery in the city of London two sites were visited and documented, the Balfron tower and Lordship Recreation Ground, next to the controversial Broadwater council housing Estate known as "The Farm" in the London Borough of Haringey. These sites stand in London in the periphery of social class and of property speculation, being both locations on the border of urban transformation.

What these two not to dissimilar sites share in common is the fragility, on one side, of a place of eventual warfare and the other, the border of the (re)use of land, of eventual, inevitable housing development. Both as a kind of warfare present in the signs of pollution, anti-personal mines, contaminated water, high volume sound and animal plagues.

Two other sites were selected to investigate the idea of the pole as a boundary where latent factors are on display. Two of them have a bridge in common, which is related to the idea of the sublime feeling, since the bridge is a representation in architecture of the border between the

known and the unknown. One is in Moscow, another is in Punta Arenas.

This sets a commonality between these two sites which is considered in this sense as polar. They are non-centralising oscillations collected and subjected to each other within peripheral phenomena (terrain vague elements from across categorical registers). These works will be the subject of analysis in the next chapter, Hierarchy.

Sound Cartography

The objective of the Sound Cartography (2009-2017) is to determine elements involved in the production of imperceptibility. It has covered a geographical area of subpolar and polar regions in the Southern hemisphere. It was initiated in Antarctica and covers over 8000 km up North, encompassing an area that may be considered polar, extreme and Antarctic. In all the different sites of fieldwork, a search for accessing Antarctica has been followed and a series of methods have been designed to investigate the domain of the imperceptible.

The interest in the imperceptible may be traced back to work realized with the Spectral Investigations Collective (Bonaccini, Fourt, Chardronnet, Horia, Pérez) in Riga, Latvia in 2007 and the infography that Bureau d'ètudes designed thereafter (*Electromagnetic Propaganda, 2010 - Bureau d'Etudes* 2015). An electromagnetic propaganda is denounced in the manifesto style declaration of the "industrial dogma". A channelling of power is implemented globally through electromagnetic technologies that enforce biopolitical domination. In the summer of 2007 during the Spectral Ecologies festival organised by RIXC medialab we performed collectively using electromagnetic devices, such as the Theremin sensor, a Tesla coil and Pure Data software. In the performance we used these devices overlapping their frequencies and improvising together on the spectral body of sounds.

In 2008, there was another meeting where some of the members of SIC joined the Peenemunde workshop in Germany in year 2008, organized by Martin Howse and Jonathan Kemp during Transmediale 2008 Conspire! Back then, the questions of the imperceptible and the ghostly

were tested and investigated through a number of technologies together with artists like Kathryn Günter, Ewen Chardronett and Cosmin Horia (Root 2019).

This experience made clear the availability of different means to bring the subliminal, the ghostly, what is not perceived, to the realm of the perceptible. A year and a half later, I travelled to Antarctica to perform Antarctic sound cartography with a VLF receiver built by Martin Howse. I would try a different type of antenna, seawater.

The sorts of topics explored in Antarctic Sound Cartography included writing landscape, an approach that took the form of a diary to give a context to the artistic action, Very Low Frequency detection and hydrophone recordings. The approaches taken included technical development, the use of transducers that may bring to audible ranges otherwise imperceptible phenomena. Water was used to receive signals, using the sea as an Earth magnitude dish antennae. In a visit to the Theremin Centre in Moscow in 2007, Andrei Smirnov told me about using water as an antennae for the digital Theremin, given its conductive properties. Being in Antarctica I wanted to test that possibility. While there is significant evidence of water and sea water being used as antennas (Xing et al. 2015) in electronic engineering the use of sea water was made here to invoke a site.

It may also be stated that a search for the imperceptible is related to the dismantlement of truth. I can describe the nature of this dismantlement by following Jacques Rancière, as a dismantlement of the hierarchical orderings implied in representation, the divisions between "orders and genres" where one is higher and other lower "the Aristotelian superiority of actions over life", and the overpassing of the "traditional scheme of rationality in terms of ends and means, causes and effects" (Rancière 2005, p14). In this sense the practice of hacking may be seen operating in an order of logic, where the main hack is the dismantlement of truth. From this perspective, the inclusion of a "proxy" to access a polar-site and Antarctica is a case of the onto-epistemological practice of hacking, as being one characteristic of such approaches, enabled by its operations outside a regime of truth. The hacking practices enabled by the Sound Cartography produce polar-site.

Figure 2.1: Installation table, *Antarctic Sound Cartography* as shown for the Viva examination at London Gallery West (2019)

2.2   Sound Cartography

2.2.1   Cartografía Sonora Antártica. Greenwich Island, 2009. Base Capitán Arturo Prat. South Shetland Islands. Coordinates: $62°28'42''S, 59°39'55''W$

Cartografıa Sonora Antártica (Antarctic Sound Cartography) was realized in the year 2009 in Base Prat in Greenwich Island, South Shetland Islands in the Antarctic Peninsula, during the summer expedition of the Chilean Navy's Icebreaker Almirante Viel. The project developed as as a passenger of the Chilean Navy. This association might be considered a compromise, but also as a form of hitch-hiking, or double agency and in this way it might be considered a form of hacking Antarctica.

The methods implemented included very low frequency, VLF detection and low frequency underwater sounds recorded with a hydrophone. The very low frequency detection is a field of research done in Antarctica at the Bharati station, the research station of India, where it is used to investigate solar activity (Guha et al. 2017).

> We departed from the city of Punta Arenas on the Magellan Straight and went over Beagle channel down to the Drake Sea. The trip to get to South Shetland Islands took two and a half days. When arriving we descended to the Island on a helicopter and stayed at the Chilean base for two days. The time frame was very short and I spent most of the time on the Icebreaker. However, the two days I could spend on the Island I was able to listen and record imperceptible signals (Research Diary, December, 18, 2009).

These methods were chosen because they make imperceptible frequency ranges available. Both the VLF receiver and the hydrophone transduce an imperceptible signal into an audible spectrum. The VLF receiver transduced very low frequencies in the range of the radio, while the hydrophone transduced sound waves of physical pressure to electrical impulses. The idea of being able to explore one domain through another is relevant to this research, as well as the combination of scales. Seawater was used as an antenna for the VLF receiver, with a cable

submerged in the sea. The use of water as antenna and the fact that the water is the ocean is an invocation of a series of elements, variables and indexes that produce polar-site. The action I was undertaking acquired an Earth magnitude and became geological art, since the ocean was the antennae of the VLF receiver.

Ice, water and other impossible antennas were displayed - impossible as non-viable for science, useless or contradictory, as an intuitive questioning of the primacy of scientific knowledge over other types of knowledge. I arrived to this reflection as I was being confronted to the heavily scientific and military narrative prevalent in Antarctica.

"What makes my work art and in what way it differs from the work of science? Am I celebrating technology and science and being a vehicle to the positive and friendly side of techno scientific dogma? (Research Diary, December 13, 2009)". These reflections were intuitive because I performed it as a reaction against the scientific and military environment of the newly met Antarctica. But it is also linked to the idea of parody that Bataille brings about in his "paradoxical philosophy" (Bataille et al. 1995, p11). The use of technical media in this particular project was performed as a parody, contrasting with the professional signal equipment of the military base. As artistic results I obtained recordings of Weddell Seals and Very Low Frequency radio signals. My goal was to understand the Antarctic site from an oblique perspective, one that would render hidden aspects perceptible. Very Low Frequencies are imperceptible but may be transduced to an audible realm through a receiver that would tune in to 2Hz-30Hz. I mainly recorded Spherics that are radio atmospheric signals corresponding to broadband electromagnetic impulses derived from lightning discharges. These recordings were later processed and listened to at different speeds[5].

I also obtained word taxonomies taken out of the analysis of abstracts from the IV Latin-American Symposium of Antarctic research organised by INACH (Instituto Chileno Antártico) and applied to these statistical software, in this case, latent semantic analysis (LSA), rendering afterwards

---

[5]The algorithm for performing this technique is contained in Audacity Software, it is called change of speed affecting time and rhythm (Vaugham Johnson and Dominic Mazzoni's implementation of Sample rate from Erik de Castro Lopo).

word visualizations, mainly Tag Clouds. The tag cloud showed the most frequent words in the texts, in the form of bigger and smaller captions that served to browse the content that was made available in a website. Latent semantic analysis is a mathematical technique that calculates a semantic distance between words. Using Singular Value Decomposition (SVD), the technique is able to render a semantic space where words are located in relation to one another. Semantic analysis is applied to a corpus of text. In previous projects I had been using Latent semantic analysis open source software.

For Cartografia Sonora I used Open Calais implementation for the content management system Drupal[6]. The idea was to gather taxonomies that were relevant to the Antarctic landscape. The corpus of text was made of scientific papers, the most repeated and most related words being the most intense. This idea originated on the way to Antarctica, thinking about imperceptible forces and unconscious aspects of site. My train of thought led me to think of the latent realm of legal treaties and the corpus of scientific research, all these words might leave a trace or intensity, due to the accumulation of words that obviously have material correlation as the Antarctic treaty bans nuclear testing in Antarctica. These word taxonomy clouds were the first attempt to make the subliminal realm of words visible.

The readings of Henry Lefebvre accompanied the activity of detecting frequencies. In The Production of Space (Lefebvre 1991), Henry Lefebvre, states that the model of frequencies is a viable parallel to study space even though "it should not govern the theory as a whole" (Ibid., p88). I tried to explore the possibilities of discrete ranges of frequencies, starting with Very Low Frequencies.

> How can I detect various ranges of imperceptible signals, at all times during the whole year? Does this detection have anything to do with the production of space? Is not the sensor devising a separation that otherwise is felt as experience? In other words, am I not detecting all the frequencies anyway, as a non-separate being, as a total entity immersed in the nature of being? The act of detection is modulating my

---

[6]http://drupal.org

perception of space (Research Diary. December, 2014)

Following the ideas developed in the speculative essay Writing Landscape, on detecting background word virus radiation in Antarctica (2016) (*Laboratory Planet* 2016), any kind of material can be the basis for inquiring the moment. It could be a radio receiver, a piezo ceramic disk or the textual diffractions performed over written material, through cut-up techniques over texts from the artist-researcher's travelogue to Antarctica. The cut-up text is considered an interface to the unconscious of site.
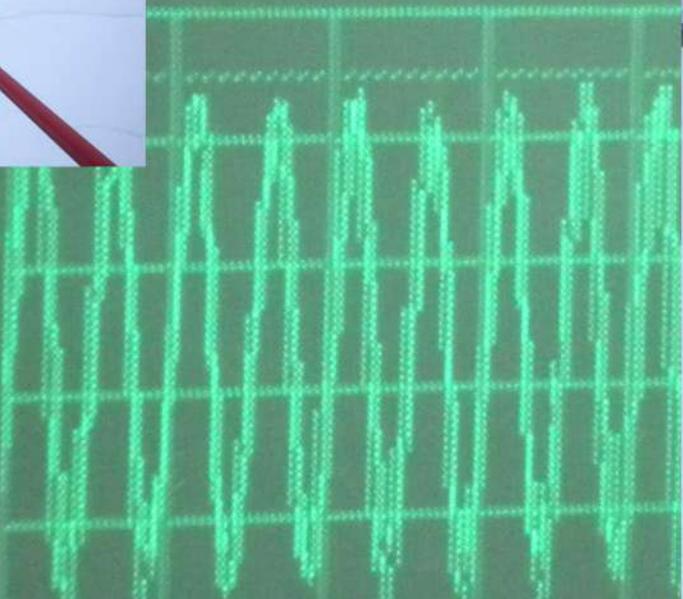
DE AUDIO

kHz Ⓐ INC:

8m   INC:

kHz Ⓐ INC:

8m OFF INC:

FREC:

8m FILTRO:

0µs/DIV

The hydrophone is a transducer device, similar to a piezo electric microphone that works transforming acoustic pressure into electrical impulses. The focus of this field work was to detect imperceptible signals, acknowledging the particularity of the terrain that is unpopulated and thus free from massive artificial electromagnetic very low frequency signals as well as wilderness presence and biodiversity that make it prone to detect otherwise unreachable animal populations.

Digital photography and video were used to document the exploration. The results in the form of sound recordings and the travel journal have been re-processed and have become new works developed to write through text permutations, text analysis using free software modules and radio programming. These works were carried out with the objective of reviewing the work on the Greenwich Island and performing time-travelling as a method of Antarctic access.

In the contextual review of this thesis, the work *Sur* of Ursula Le Guin, is an example of a method that responds to Antarctica beyond the sublime where time-travel is the narrative tool that allows this access. In this sense, it may be worth recalling the notion of space-time and matter that Karen Barad describes. Karen Barad theorizes about intra-action and time as space-time-mattering. She calls it "agential realism",

> On my agential realism elaboration, phenomena do not merely mark the episte-mological inseparability of "observer" and "observed", rather, phenomena are the ontological inseparability of agentially intra-acting "components". That is phenomena are ontologically primitive relations – relations with- out pre-existing relata. The notion of intra-action (in contrast to the usual "interaction", which (...) the prior existence of independent entities (relata) represents a profound conceptual shift (Barad 2003, p815).

The concept of agential cut is of relevance for this study since it provides a context for the term "measuring agency" that is used throughout the thesis. One of the main conclusions of the fieldwork is that the technical apparatuses modulate the production of site. That the measuring agency, such as a sensor or a yeast culture in an agar plate performs site in the same sense

that Barad declares when writing that "the agential cut enacts a resolution within phenomenon" (Ibid., p140). These resolutions might be digital or affective such as in vertigo or pain and they depend on the ontology, whether it is a computer, a sensor or a human.

The different availability of methods to access Antarctica, gives place for questions about reality and truth. Why is there a hierarchical organization of the different activities of a human? Why is there a dominance of actions over imagination? The constraints of the visit to Antarctica pushed the creativity of means to register and expand the information gathered. There is no point to work under the constraints of science. The framework of art liberates the conditions.

2.2.2 UKIKA, turn of the year 2014-2015, Puerto Williams, Navarino Island, Beagle channel. Coordinates: $54°56'00''S, 67°37'00''W$

Ultraviolet detection, luminosity graphs, digital photography. Navarino Island is located on the Beagle channel, on the way to Cape Horn. The trip takes one hour and a half on a small plane. I came there and performed walks around the base exploring the area, making a photographic registration and detection of ultraviolet radiation, light and decibels. The detection is performed using a wireless sensor unit that sends data to a Pure Data patch. The values of each sensor, ultraviolet, luminosity, decibels and temperature are stored in software arrays. Navarino Island is mainly a military base, with a 25 percent civilian population.

My second visit to Isla Navarino was in the end of the year 2015. The idea was to be more concentrated in the forest surrounding the village of Puerto Williams than in the previous visit in 2013 which was focused on the village and the community. The visits were made recording ultraviolet light, temperature, sound and luminosity. But also a sense of landscape was pursued through walks to the forest, searching for antennas for VLF detection in garbage lots surrounding the village. Little or no very low frequencies were detected but the meeting with the space of residues was made visible through photographs. I considered this an encounter with the unconscious of site.

I found obsolete and discarded pieces of ships. No tangible success was attained through this exploration but a sense of place was registered in pictures. I see the need to work with analogue media and the limitations of digital media. The themes and approaches explored included naturalism and detection of imperceptible quanta[7].A naturalist approach was undertaken, observing the area, eating from wilderness and making a photographic registration of the exploration. A technical approach was developed as well, since measurements were taken with a sensor unit.

> I made walks to the surrounding forest and garbage lots in Puerto Williams, some of them in private navy areas. I had technical problems and my data recorded some battery failures. I think I need to return many times. "How can I grasp the sense of landscape without spending time on site?" (Research Diary)

The experience offered insights with respect to the technology used to register environmental variables. The contact with the massive extension of the area of study and the potential for future exploration. In particular the peat bog and the ecosystems in mud. The contact with the naval garbage lot in the forest made me realize the relation between what may be called the unconscious of site, as historical accumulation of garbage. It also made me realize that when confronted with the limitations of my sensing devices, there is always my own experience. I was there despite the unavailability of means to sense and register the moment.

2.2.3 Pali Aike volcanic field. Austral summer 2015. Coordinates: $52°06'00''S$, $69°44'00''W$

I used a technical orientation and deployed the measurements of site, the detection of ultraviolet light, decibels, temperature, luminosity. The approach taken, involved sensor detection and photographic registration. Weather conditions made measuring difficult and the problem of the means of sensing acquired new perspectives. My own means seem insufficient.

---

[7]The notion of quanta is used in this research to indicate a relationship between the hacking practices with the silent discourse of germinal states, intensity and regions of potential. Quanta has been used by Brian Massumi, paraphrasing Gilbert Simondon indicating that "Simondon calls these regions of potential, "quanta" " (Massumi 2002, 34). It refers to an accumulation where there are no clear borders but regions. These potentials are at the same time "abstract as they are actual" (Ibid.). In the context of this research, they are considered as processes, dynamics and accrued indetermined knowledge.

Sensing and detection worked fairly well but limitations began to appear, in terms of energy constraints when confronted with bad weather conditions, like rain. The limitations are basically due to battery duration of the computer that is recording the sampled data into arrays. The computer's battery has a capacity of two and a half hours and I have the feeling that capacity lowers with cold. The sensor unit is also a bit fragile when it comes to harsh rain and strong cold wind, all of these characteristics of extreme landscape. "My equipment is so limited and so is my body in this vastness. I wonder how can I grasp the varied intensities. I look at the lichens, they probably embody the intensities I am after, should I try to detect variations in them? (Research Diary)" I had the experience of being outdoor for the first time with my computer and my sensor device. It was an experience about them, with them, being outside in the rain with the small units. The main insights were about portability of the equipment and the first contact with the conditions present in the moment of sensing.

2.2.4   Exploration to Cerro Sombrero in Great Island of Tierra del Fuego. Austral winter 2015. Coordinates: $54°46''35''S, 69°17'27''W$

The methods used included, black and white photography, ultraviolet and luminosity graphs. Land art, body art performances. In the Winter of 2015, I went to Cerro Sombrero in the Great Island of Tierra del Fuego in an exploratory journey with local performance artist Macarena Perich. The plan was to spend a week in the oil mining town, researching in their library about the history of the place and realizing recordings in the surrounding areas, with a focus on their electromagnetic infrastructure. Ultraviolet light was also measured as well as luminosity, temperature and decibels. The frozen temperature didn't have a visual correlate, only some frozen lagoons that were listened to with piezo microphones.
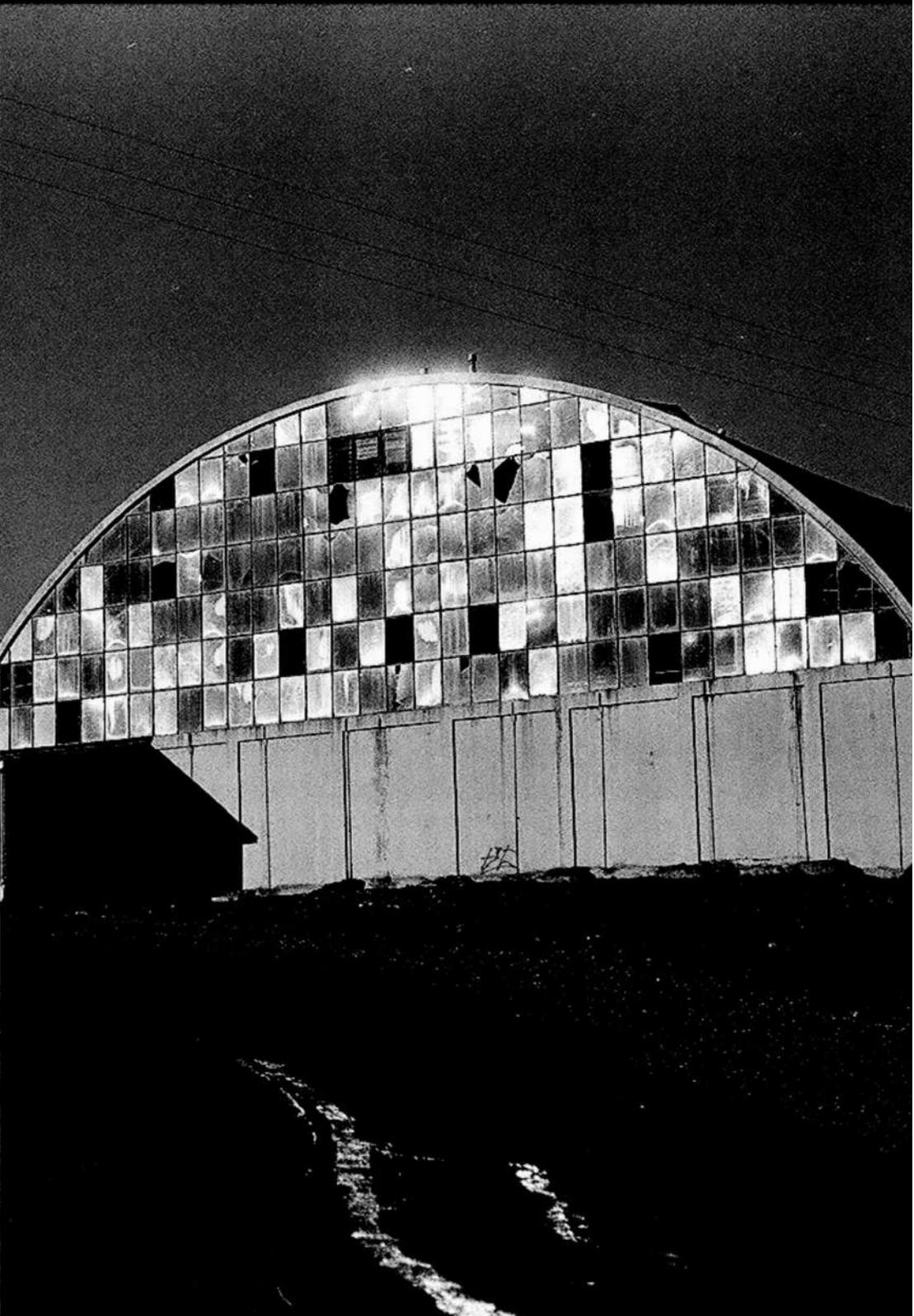
The type of questions that this foray encountered were focused on what is the relation of these measurements and my experience of site? It was learned that the sensor array used was modulating my experience of it. It was a perception of a gap in the Kantian sense, of not being able to access the experience as a totality because of my conscience of the discreet representations of my sensor arrangements. As a reaction and influenced by the study of Land Art and in particular of Robert Smithson and Gordon Matta Clark, I continued developing an investigation where my sensor tool would be my own body and the body-mind states such as vertigo and disorientation.

> I started to put my head inside holes found in the land. Probably the access to animal habitats. The experience was successful and created a perplexing visual effect in the photographs of the performances. It was extremely stimulating to use my whole body to sense landscape, as a direct immediate touching contact. This fact led me into the thinking of a surface, a membrane, a mimetic interface. How can I have sensor tools that will lead me to sense the moment as my body-mind does? My own body has a correlate, my skin reacts, my psyche dreams at night. We stayed a week in the mining town of Cerro Sombrero, visiting the library, joining the shifts at lunch hours, making photographs of the settlement and surrounding area and developed performances in the local surroundings (Research Diary).

Time was limited to conduct the research. Nevertheless, some strategies were deployed to uncover my object of study, polar-site and the detection of the imperceptible in subpolar landscapes. The approaches were first focused on the sensor unit and piezo microphones to register environmental data into software arrays but at the same time, another approach considered more direct and focused on direct perception was taken. In the first place using inverted postures, to defy the orientation axis and metaphorically, to defy the North-South axis. Secondly throwing the body down the slopes was used to induce vertigo and elicit disorientation. These body-mind states, vertigo and disorientation were used as sensors to interface with the site. Both methods keep a tight relation with the production of space since a new perception of the site of investigation is elicited with the method to study it.

Possibly, I should gather data from industrial mining technologies in order to rep-

resent hidden aspects of site. In this way the limitations imposed by my own technologies might be overcome (...) In my body, all possible signals leave an imprint. It is true, I cannot recall a factor of intensity of ultraviolet radiation, but in fact I had sunburn. In fact, my own body senses signals that I am not able to perceive, but quanta affects my tissues and my memory – a sort of tissue. How can I subtract my knowledge about indigenous cultures when I visit remote places and only measure frequencies and radiation? How can I incorporate the centuries of exploitation that came along with the expansion of the British empire and the heroism of its discoveries in remote places? My discrete numbers do not acknowledge memory and history but my body does, and words do. I think I have to use a culture, a biologic organism, something that would have similar qualities to my body-mind or to parts of it (Research Diary).

2.2.5 Exploration to Puyehue Volcano. Austral Summer 2016. Puyehue, Chile. Elevation 2,236 m (7,336 ft). Coordinates: $40°35'25''S, 72°07'02''W$

Very Low Frequency detection, Yeast experiments. Digital Photography. Sound recordings. Following the readings of Cosgrove and DellaDora (Cosgrove & Della Dora 2008) about the relation between high altitudes and polar-site, another type of exploration was pursued, of a volcano of 2236 m of altitude in the subpolar region of Los Lagos in southern Chile. As background to the project, the subpolar explorations and the exercises in environmental detection may be considered.

The themes and approaches explored were imperceptible nature, sublime feelings, heroism. The approach taken was developed through field recordings, Very Low Frequency detection and ultraviolet light detection was pursued as well. The very low frequency detection, in this case, was made using a sheet of glacier ice and running glacier water as antennae. Sound was recorded on one edge of the area that constitutes the most recent crater of the Puyehue Volcano. The commonalities in forest types and extreme distribution of natural elements, high luminosity, low temperatures and sudden changes made the exploration to this volcano a simile of a polar expedition.

We started ascending towards a refuge through a cold forest, the day outside the forest was warm and sunny. It took us five hours to reach the top. I think of the ways I use my body to make a direct contact with the forest. I have to get to know her if I want to climb through her without hurting myself. I am hurting myself, I am carrying too much weight, my knees hurt, and my ankle. I try and touch the forest and lay down where I see a plain spot but everything is a slope (Research Diary).

My equipment for sensing became obsolete in this context, I would happily throw everything down the hill. By the time we reached the refuge we were excited and very warmed up, just on time before the sunset. Some people were there and we were chatting and eating some nuts and we lost the sense of time, until a sharp cold sensation reached our spines. It was too late to cover myself while my body was warm, and now the cold fell upon us. I put every piece of garment I was able to find in my backpack, but it was dark and cold. Suddenly the meaning of sublime started to become a physical evidence (...) I thought it was the coldest night of my life. Cold is inevitable, it dominates the body, again the sensation while in the forest, the ghost is attached to the perceptible, it corresponds unequivocally to it, the ghost of cold is an excess of the physical sensation that penetrates incessantly the skin, the bones, the body-mind.

Definitely I did not have the proper equipment to be in such a place. And I was there and in the middle of the freezing night I thought it was very much like the heroic expeditions to the Poles that I had been reading about. The extreme beauty felt overwhelming, I sensed it as an impairment of the senses. From what I was watching and what I was sensing, when I had to go out of the shelter I saw all possible stars in the most amazing polar dark southern sky. A fine Moon line appeared in one of the sights, fragmentary sights and a type of memory where I sensed a bright light even though I know there was no such a light, perhaps only the cold, like a constant background bright obscure light. A contradictory feeling.

The next morning, I felt heavy and light at the same time. Contradictory, my body felt weary but psychologically I felt satisfied. I had survived the annoyance of cold

and made my way to sleep. I sensed some victory over my body (...) I have to be more prepared for the next night. Perhaps if I heat those volcanic rocks and heat up the tent. The next source of water was 1.5 km away, a natural affluent on the way up to Puyehue, I had nothing to eat and a sip of water, the lightness is pervading everything, as luminosity and softness. And we have gone much too high without finding the spring, the water. Until one of my friends noticed a certain sound - as I noticed some loss of aural capability in myself. We found the right spot to make recordings and drinking water, next to a sheet of ice, in a type of space made naturally in between the soil crevasses. It was a space in a landscape, I felt I could learn to live there. We ate some cherries that we had to sort out of a lot of rotten cherries. Not much and some honey (...) We went up trying to reach the cone of the volcano. As we were ascending the materials changed, at some point, big obsidian rocks and at the top, yellow and red lines carved inside grey and dark grey rocks. We reached the beginning of the cone and made recordings, my companion was feeling a bit sick. I think we were "hotheads" by coming up here without eating properly.

We decided to go back down but before I made some sound recordings at the top. The sound was of an immense bowl of indistinguishable bits, somehow, I sensed the water, I could see far down to the lakes, some mild wind currents, voices? cars? seagulls? (...) On the way down we returned to the spring spot and I made a speculative antennae with a sheet of ice and recorded half an hour of natural radio signals. We are all starving and we have to rush down to our tent and make a fire and eat some eggs. Nothing but enthusiasm fills me up (Research Diary).

The understanding of this sublime feeling is made evident as materialized in this visit. On the one hand the bleak sublime, measured in the night through extreme cold and amazing never-seen-before skies. On the other, the white sublime, immense, bright, uplifting and transcendent of daylight and high altitude.

As we were descending there was a sudden sound and a shadow of an air propelled plane passing over us. A sudden change of time, suddenly we were part of

civilization and aeronautical science – our recording gear somehow was translucent before and it did not count for science or technology – perhaps we consider it part of our extremities and senses, somehow (it seems) the technological objects mediate the relation with the sublime. We made an ascension of 2236m to the Volcan Puyehue cone. We stayed at the shelter with our minimal equipment for two nights even though the plan was to stay overnight. Sound recordings were performed and tests with a speculative sensor, yeast.

The approach included naturalism as in eating wild raspberries or not eating at all, poor equipment. All these factors helped to understand the sublime feeling and the heroic but was on the way of performing a further exploration of the visited area. I am beginning to develop my idea about mimetic interfaces through the use of living agencies. I brought yeast along and poured water into it, I made some photographs, I expect changes but nothing happened but some bubbles of air (Research Diary).

The proportion of involvement with wild nature is inverse to the use of technology. When the research is immersed in the struggle of survival, the media to document the experience becomes obsolete. The experience of survival exceeds itself, recording technology does not match the excess.

2.2.6 San Juan, Punta Arenas. Austral Summer 2017. Coordinates: $53°09'17''S$, $72°07'02''$

The methods involved in this exploration included, black and white photography, specifically the use of unfocused images and mechanical error manifested as light leakage and crystal radio recordings. Following the investigations realized in Tierra del Fuego, during the visits to Cerro Sombrero mining town and lately to Ushuaia, doing mainly sampling of frequencies. At some point, these methods, in particular the sampling of frequencies became obsolete because they embody a scientific approach for the study of nature. Considered as insufficient for the investigation that appears to work outside the production of truth of science. Instead, it proposes to investigate what the other terrains are outside of truth.

The objective of this exploration was to explore the confines of the river, following its stream according to the fisher catch trail. Rio Verde is a river known for its countless accidents where numerous people have drowned in deep waters and complicated root textures that serve as perilous nets. People however enjoy its otherwise peaceful surroundings and the fishing of river salmon and trout. The river shows evidence of geological formations, in particular, cretaceous arenites from the Austral Magellan basin.

For documenting this exploration, a method of sampling was followed, using a Crystal radio, to sample radio frequencies and black and white photography to perform light detection. The actual camera for making the pictures leaked light which was considered a source of mechanical error. This anomaly is considered a possibility of the detecting device, that manifests differences of light leakage, as an aperture to error. Degrees of this error manifest aberrations, that are considered non-truth devices.

The key concepts are non-truth and geology. A series of photographs were taken following a fishing trail along the river course. A rule was followed, to sample the vegetation texture and to perform a register of "moments". These moments were found during the walk in the subpolar forest. Moments are defined as instances, marked by some keys like light, sound, geological configurations or animals that elicit a sense of presence. In this sense the word moment is borrowed from Henri Lefebvre's reference to Nietzsche's "Augenblick" as the instant, in which Lefebvre was interested, opposing the notion of duration (la durée) of Henri Bergson (Lefebvre 2004, x). These "significant times" that challenge existing conventions are considered in relation to site-selection as a practice of land art and site specificity (Smithson & Flam 1996). Two visual devices were explored, the dislocation of focus, as non-focus and as secondary focus or focus on the ordinary. The second visual device is light leakage from a malfunctioning camera. These two visual devices are part of the experimental conditions set by the artist-researcher as part of the experiment to access the imperceptible. A series of recordings using a galena radio and the use of a bridge as antenna failed in the testing but served as the basis for the second series of

radio explorations in the city of Punta Arenas.

A series of black and white photographs were taken developing the above mentioned methods, dislocation of focus, secondary focus and error as light leakage. The possibility to use urban infrastructure as parts of the circuit for frequency detection was realized in this exploration to Rio Verde. The in habiting of moments was also analysed, the confrontation with different temporal scales as in the geological features of the river bed. And the alteration of my own time when confronted with such a scale.

Light leakage was an unconfirmed possibility in this camera. The leakage coincided with a particular photographic situation, that of taking the pictures because there was something uncanny in the visual field. The pictures also served to start thinking of the images as indexes of the moment, thus the image is thought of as arrays of points.

2.2.7 Explorations in Punta Arenas. Austral Summer 2017. Coordinates: $53°09'17''S, 72°07'02''$

The light leakage method was pursued following the idea that the uncanny is found as an affect in the visual field. The method consisted in shooting the picture from a prehension, defined as perception that not necessarily involves cognition. In other words, the shooting was guided by a sensation of inexplicable familiarity. In this sense, the key is to follow the uncanny feeling as the strangely familiar.

In this case the realization of the results was not immediate, but only after two weeks. I had suspected that the light leakage would happen but, as manifested in earlier works, it was not possible to ensure whether it would occur, when and of what type of manifestation it would be. The results coincided with the photo shoot following the uncanny feeling.
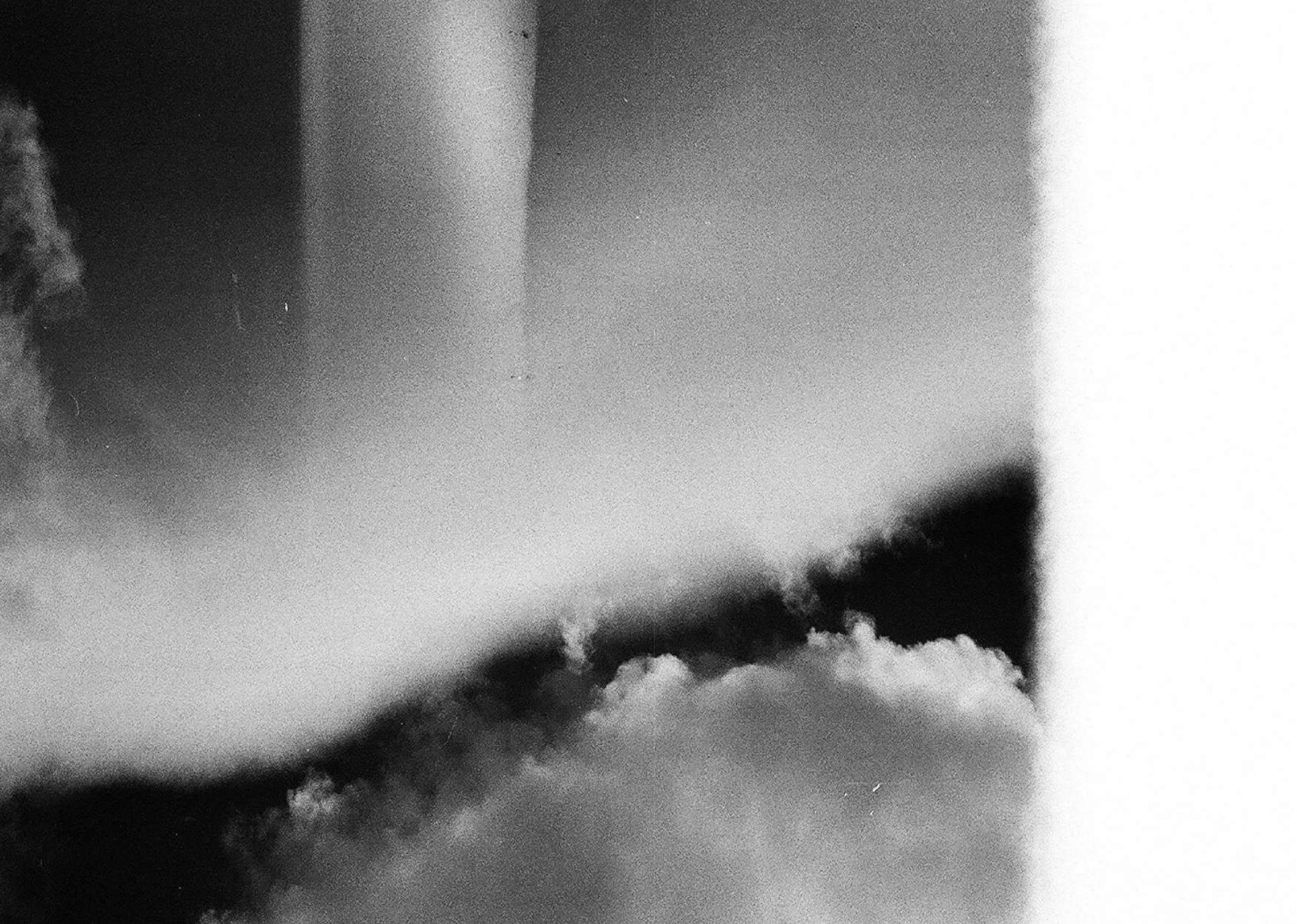
2.2.8 Ushuaia. Austral Summer 2017 Coordinates:$54°48'07''S, 68°18'11''W$. Black and white photography

The methods used included, black and white photography. Ultraviolet detection and graphs. Luminosity detection and graphs, The most prevalent thought of this trip was the luminosity, that in this location seemed so particularly differentiated. The social struggle of the city was also present, something that contrasted with other polar locations where this is suppressed. Perhaps only in Punta Arenas this is similar. Both cities have a past as a prison infrastructure and a location of political exile.

> I travelled by bus from Punta Arenas to Ushuaia, Argentina. I performed there together with Punta Arenas's electronic music band Lluvia Acida and had two days to record luminosity graphs and make a study of the city with black and white photography. In these pictures, I explored the social construction of Antarctica in terms of the image of Antarctica in advertising and tourism. Geopolitical propaganda was found extensively in protest for the events of the Malvinas war in the 80's. I looked for the representations of Antarctica as well in the objects inside the eating places and cafes. Research Diary, 15/01/2017.

DE LA PROVINCIA

DEL FUEGO,

BRA DEL ATLÁNTICO SUR.

LAS DEL ATLÁNTICO SUR.

ANTÁRTIDA E

ANTÁRTICO DE GUERRA DE M

REGISTRATION OF VETERAN OF WAR OF MALVINA

VETERANOS DE GUERRA DE M

PROVINCIAL DE VETERANOS DE

SON Y SERÁN ARGENTINOS"

GEORGIAS SANDWICH DEL S

LAS ISLAS MALVINAS, GEORGIAS SANDWICH DEL ST

MALVINAS, AND SOUTH GEORGIAS AND SANDWICH

ARE ARGENTINE AND WILL BE

2.3   Summary of methods

The 'time traveling' needs a bit more situating. Time-travel is invoked in relation to intra-action (Barad 2007) - as her onto-epistemological thesis troubles western notions of time. Her thesis claims an ethics of responsibility in conceiving time as non-linear. She calls Masahide Koto's argument that nuclear war has been taking place on this earth in the name of 'nuclear testing', since the first nuclear explosion at Alamogordo in 1945 (Barad 2017, p58). Since that time more than 2000 atomic warheads have been detonated (Ibid.). She stresses that the victims of atomic testing have been mainly indigenous people and countries of the 4th world. I would also add the animal kingdom and the ecosphere through the atmosphere and ocean currents.

> Thus history has witnessed the nuclear wars against the Marshall Islands (66 times), French Polynesia (175 times), Australian Aborigines (9 times), Newe Sogobia (the Western Shoshone Nation) (814 times), Christmas Island (24 times), Hawaii (Kalama Island, also known as Johnston Island) (12 times), the Republic of Kazakhstan (467 times), and Uighur (Xinjian Province, China) (36 times). (H-Bomb Guinea Pigs) (Ibid., p58)

Globalism for Barad is tied to the militarisation of time, presenting the invention of the nuclear clock as the key element that controls GPS, telecommunications, and high-speed transfer on internet lines (Ibid.p59)[8] According to Barad, quantum physics understands the nature of time first of all deposing measure as arbitrary and challenging the ideas of closure and totality, exposing quantum indeterminacy as a dynamism rather than a form of unknowingness (Ibid., p62).

The methodology describes a series of observations (cuts) collected around the eccentric, the periphery and the pole. It is a constructivist methodology built around ad-hoc associations as in bricolage. In the following tables the works realized will be listed as well as the methods applied in each one. A justification is displayed along to make available the context of the experimentation. After that a list of research practices is provided, based on the location of the foray and the

---

[8]it took the U.S. government nearly seventy years to acknowledge that it was even worthwhile to do a study of the possible adverse effects on the people who were exposed to radioactive fallout from the 1945 Trinity test, despite the fact that following the test blast, 'American Indians would begin to experience many types of cancers – rare cancers as well as multiple primary cancers' (H-bomb Guinea Pigs.) (Barad 2017, p59).

works developed. These lists are used as an introduction to the next chapter that is focused on probing the notion of hierarchy.

2.3.1 Methods

Method	Justification
Sampling	Capture and archive fragments of visited sites
Very Low Frequency detection	To capture imperceptible signals in the electromagnetic low frequency spectrum.
Hydrophone recordings	To be able to listen to natural imperceptible sounds from animals.
Travelogue and Video Diary	To document the explorations covering dimensions exceeding the recording media.
Text Cut-up	To explore concealed dimensions of text through word permutation
Environmental sensing	To record environmental keys, characteristic of site
Ultraviolet detection	To record environmental keys of South subpolar areas
Electromagnetic detection using coil transducer	To explore different methods to approach the electromagnetic imperceptible
Light detection	To record environmental keys imperceptible because of insignificance
Sound sampling	To record environmental keys imperceptible because of insignificance
Temperature detection	To record environmental keys
pH detection	To document reactions of biological ontologies to the site
Graphs	To record environmental signatures
Black and white photography	To sample a configuration of site in the light spectrum
Infrared photography	To reveal concealed dimensions of site in the light spectrum
Body-land art performances	To explore accessing site with multisensorial forays
Ascensions and walks	To explore accessing site with multisensorial forays
Pollution detection	To access concealed dimensions of urban site
Fermentation	To access site with multisensorial forays
Infection	To access site with multisensorial forays
Lactobacillus cultures in agar plates	To perform visible reactions of biological cultures in site
Image as array of points	To explore visualizing environmental patterns and signatures
Radio sensing	To access imperceptible signals in the electromagnetic spectrum
Error	To access imperceptible dimensions of site as production
Soil Patterns	To access imperceptible dimensions of site
Dislocation of focus	To access imperceptible dimensions of site
Light leakage	To access imperceptible dimensions of site and follow keys to define the uncanny.
Glitch	To access imperceptible dimensions of site as production
Urban infrastructure as part of the circuit	To access the electromagnetic dimension in urban site
Sonification	To translate imperceptible realms to the audible realm
Image to raw data	To explore patterns concealed in site via translations
Raw data to sound	To explore patterns concealed in site via translations
Radio transmission	To translate evidence into affect. Combination of knowledge and not-knowledge. Superposition
Stereo panning	To perform dissorientation. Translation of evidence into affect.
Quadraphonic sound	To translate evidence into affect due dissorientation and the perception of sonorous volumes.
Interactive objects	To translate evidence into affect.
Live performance	To translate evidence into affect. To rise an affect.
Installations	To translate evidence into affect

2.3.2 Research in practice

Project	Description	Site	Detection	Access-Non Access	Discursive practice	Code
Sound Cartography						
Cartografía Sonora Antartica (2009)	To register imperceptible signals	Greenwich Island South Shetland Islands	Hydrophone, sensor unit, Body as sensor, Video	Non-access-Access	Transduction	0 1
Puerto Williams (2015)	Contrasting phenomenal invisibility with ontological presence	Navarino Island	Sensor Unit, Garbage as archive	Non-access, Access, Non-access	Accretion, Sedimentation	0 1 0
Pali Aike (2015-2016)	To inquire about geopolitical borders and the borders between things	Pali Aike (border between Chile and Argentina)	Sensor Unit, Body as sensor, pH, Video, Soil Pattern	Non-access, Access, Non-Access, Non-Access, Access, Non-Access, Access, Non-Access	Translation, Sedimentation	0 1 0 0 1 0 1 0
Cerro Sombrero (2015)	To inquire about the productive forces shaping the land	Tierra del Fuego	Rolling down the slope, Black and white photography, Sensor Unit	Non-access, Non-Access, Non-Access, Non-Access, Access	Touching,vertigo, inversions, imprinting, translation	0 0 0 0 1 0 1
Volcan Puyehue (2016)	Testing the concept of the polar, exploring the feeling of the sublime	Puyehue volcano	Body as sensor, VLF, Yeast as sensor	Non-Access, Non-Access, Access, Non access	Pain, sublime feeling, transduction, fermentation	0 0 1 0
San Juan (2017)	Depicting forms of silent speech	Punta Arenas	Black and white photography	Non-Access, Non-Access, Non Access, Access, Non-Access	Imprinting, transduction, translation, sedimentation	0 0 0 1 0
Punta Arenas (2017-2018)	Explorations of the uncanny feeling	Punta arenas	Light leakage, radio Galena, black and white photography	Non-Access, Non-Access, Non-Access	Imprinting, transduction	0 0 0
Ushuaia (2017)	Exploring the image of Antarctica	Tierra del Fuego (Argentina)	Sensor unit, black and white photography, light leakage	Non-Access, access, non-access, non access	Translation, digital signal processing, imprinting	0 1 0 0
Polar pollution						
Crossing a border with a yeast culture (2016)	Performance, crossing a geopolitical border with fermenting yeast	Chacalluta, border between Chile and Perú	yeast on petri dish	Non-access	Fermentation	0
Lordship Recreation Ground, London (2016)	Frequent visits to the sewage pond	Broadwater Farm, London	Body as sensor, yeast as sensor, black and white photography, infrared photography, Pytiriasis Rosea, sensor unit	Non-Access, non-access, non-access, non-access, access, non-access, non-access, access	Infection, translation, transduction, imprinting, digital signal processing	0 0 0 0 1 0 0 1
River Moskva (2016)	Accessing different space time coordinate	Moscow, Russia	yeast as sensor, Image to raw data, Raw data to sound	Non-access, Non-Access, access, access, non-access	Fermentation, translation	0 0 1 1 0

Non-site

Yeast (2016)	Lecture performance and yeast sonification	Conference Law and the senses	Yeast, Theremin sensor, Performer	Non-access, access, non-access	Fermentation, digital signal processing, performing	0 1 0
Lactobacillus vaginalis as an aesthetic response (2017)	Collective performance	Culture on agar on petri dish	Lactobacillus vaginalis on agarplate	Non-Access	Seeding, fermentation	0
Antarctica 1961-1996 (2017)	Interactive embroidered map of mineral resources and pollution in Antarctica, installation, conductive embroidery, Theremin sensor, four channel sound spatialization	Non-Access, non-access, access, non-access	Intra-acting, diffusing sound			0 0 1 0
A sublime settlement (2017)	Video work produced by a glitching application on a Gnu-Linux station, to document the article The story of Nukey Poo in the bulletin of atomic scientists.	Fiction documentary	Found youtube footage, websites, Video glitch, permuted text, time travelling	Non-Access, access, non-access, non-access	Glitch, time traveling	0 1 0 0 0
Beer Moulds as an aesthetic response (2017)	Changes of mould contaminating yeast on agar	Culture on agar on petri dish	Mould as sensor	Non-access, access	Contamination, symbiosis, Digital Signal Processing	0 1

Chapter 3

Hierarchy

3.1   Introduction

I will be combining discussion on aesthetics, with the Anthropocene and specific artworks that I have developed that demonstrate the methods discussed in the previous section. We return to what Stephen Pyne asserts, about the impossibility of Art in Antarctica and establishing a link between this impossibility and the regime of representation of the sublime. As we have seen in previous chapters, the sublime enforces a hierarchy, a division between what is possible to know and what is not. We have reviewed the Critique of Judgment by Immanuel Kant and have emphasized that the aesthetic judgment is described next to other types of judgment such as the reflective judgment, as a fundamental part of human cognition, and one that provides the notion of purpose. We may consider that this mental power of judgment is as valid as direct perception and logical propositions and shall see it recovering its initial signature as a subject worth studying, and as it started to be investigated in the historical period of the enlightenment.

Its genealogy is recent (Rancière 2009, p5), and is "generally referred to in Baumgarten's Aesthetica" (1850) (Ibid.) and for whom aesthetics had to do mainly with "indistinct knowledge"[1]. The fact that he considered the sensible as cognition enabling the sensitive, may be thought of

---

[1] The philosophy of sensitive knowledge was called *Cognitio Sensitiva* by Baumgarten who had very few adepts due to his cryptic Latin style of writing that may have led to his misinterpretation (Gross 2002, p5). It is worth noting that in Baumgarten's perspective, aesthetics is considered another kind of knowledge. He nevertheless, repeated the hierarchy at the interior of sensitive knowledge since he established a range within the sensitive experience, choosing those that were much more clear to the understanding of it.

as a primitive admission of aesthetics into the realm of knowledge. It was not directly connected to the arts and the beautiful but it was a discipline focused on determining a "cognitive value" of human sensibility (Nuzzo 2006). It attempted to become what we can call an "alternative philosophy of knowledge" (Gross 2002, p403). The study proposed by Baumgarten restricted the range of sense perceptions to be studied (Duncum 2005, p11). This restriction meant that the sense perceptions to be accounted for were characterized by there clarity and similitude with logical thought (Ibid.). Aesthetics was thus considered as a sort of rational thought which used other means for it to be expressed (Ibid.).

Aesthetics on the other hand, in Kant's Critique of Judgment "corresponded to a type of judgment" (Rancière 2009, p6). This judgment was based on pleasure and displeasure, a substrate that connected judgment with the body in a direct but concealed relation with nature. In Kant the aesthetic experience enables the supersensible faculty, a sublimation of the senses that transcends the body. Without necessarily agreeing to his ideas that have enabled us to think other philosophical problems such as the problem of thought without a body (Lyotard 1991), it would be interesting to come back to the meeting of the body and nature.

It may be argued that Kant and Baumgarten thought that aesthetics is a form of embodied knowledge, based on pleasure and displeasure. We may argue as well that aesthetics introduces the non-human in the act of knowing, as they both rely on a common substrate. Humans and nature share a common substrate, satisfaction and withdrawal, felt by humans as an economy of pleasure and pain. This economy has been a subject of enquiry for Sigmund Freud and psychoanalysis as the primary principle of the unconscious (Freud et al. 1954) while other authors such as William S. Burroughs take special note of the kind of circuit that pleasure and pain form, he calls it "the algebra of need" (Burroughs 2007) referring to a cycle between satisfaction and withdrawal. In such a circuitry the energy circulates and maintains homeostasis. The borders however remain unclear. For Burroughs, extra-terrestrial entities (non-human), communicate through "pleasure lines" and execute control using the algebra of need. I will come back to this point later in the chapter on analysis.

To come back to the notion of aesthetic judgment described by Kant in the Critique of Judgment, we may argue that its inclusion in the system of cognitive powers demonstrates the importance of aesthetic knowledge, indicating nonetheless, a division in the hierarchies of the spirit. We can also conclude that the impossibility to access the other (non-human) is based on hierarchical orderings since Kant describes a moment of access in the mathematical sublime, but where the access is indirect and non-verbal. We may see that what shapes a difference is a hierarchical ordering of the experience, in the sense that Jacques Rancière contests in his ideas about the distribution of the sensible (Rancière 2005). The characterization of the aesthetic regime as a redistribution of the sensible by Jacques Rancière will provide a framework to understand the non-hierarchical apparatus that an aesthetic response to Antarctica is. Lastly, the chapter will make a comparison between the aesthetic regime and the processes of sympoiesis described by Donna Haraway in the context of the Anthropocene. The discursive practices identified by the feminist writers like Haraway and Barad are considered a methodology that has been deployed in the practice of this work as it will be demonstrated in the chapter on Analysis. For now, it is necessary to define the terrain of operation within the aesthetic regime.

The sublime representation performs hierarchical relations through the assumption that there is something beyond our capacity to know. Scientific discovery may be seen under this light as well, as it embodies the promise to unveil what is not known. It counts on a hierarchical ordering where what is known as logical and empirical propositions have the privilege over what is not known. As it has been addressed before, the assumption laying under discovery, of being able to make visible otherwise hidden aspects entails, according to Rancière "a position of mastery". In return, he proposes to look into the aesthetic regime as the revolution of the nineteenth century characterized by the multiplicity of representations.

The aesthetic regime is characterized by the primacy of description inherited from the realistic novel declaring the primacy of "the form of the visible that does not make visible" based on the absorption of the "pathos effects" and the "power of ordered distribution" into an "apathetic

pathos" of successive "little perceptions where activity and passivity can no longer be distinguished" and "each of which is affected by the power of the whole" (Rancière 2007, p121).

Following his thesis, there is not such a thing as appropriate representations and that there is a "general availability of all subjects for any artistic form whatsoever" (Ibid., p118). In this regime available since Romanticism, things are not easily transferable to fictional references because they are no longer "characters but foundational myths" (Ibid., p121). The new regime is the aesthetic regime.

A logic of minor perceptions is the main attribute of the new aesthetic regime alluded to by Rancière, that argues for the annulment of the "representative mediations and hierarchies" (Ibid) and the capacity of no event to proscribe representation (Ibid., p129). In *The Aesthetic Revolution and its outcomes*, Rancière explains that the aesthetic revolution is not about the influence of an author but rather of the end of the separations between the spheres of life (Rancière & Murphy 2002, p133).

He renders an account of the aesthetic dimension of politics that considers aesthetics as the core of the revolution of workers rooted in a change in the relation with time (Rancière 2004, p14) and that implies a complete reorganization of experience, in particular the use of the night for other means than sleeping, e.g. enjoyment, writing or organizing. For Rancière, it involved "a process of dis-identification, another relation to speech, visibility and so on" (Rancière 2005, p14). Jacques Rancière analyses the interrupted spectacle of representation as one of the processes propelled by the aesthetic regime in order to dismiss "the privilege of the theatrical space of visibility", the "separate space" that characterizes representation (Rancière 2007, p122). Oppositely, Rancière recognizes the absorption of pathos that may be the antidote to the theatrical representation of the Anthropocene. The absorption of pathos may be placed in parallel with Donna Haraway's call for an understanding of sympoiesis that focus on the relations rather than in the characters or the entities with fixed boundaries. Haraway asks us to be suspicious of the apocalyptic tale of the Anthropocene that results in social conformism rather than in so-

cial change (Haraway 2016). These unprecedented times of looking away may be overcome by learning to live with the catastrophe. Instead of grand narratives, another logic is called to be set in place (Ibid.). In this sense, I suggest that the time of multispecies that Haraway recognizes may be considered similar to the "logic of minor perceptions" described by Rancière as present in the realist literature of Mallarmé for example. The integration of all the spheres of life may be comprehended in an ecological perspective as the non-hierarchy between species.

Aesthetics is defined by Rancière as a "mode of thought that develops with respect to things of art that is concerned to show them to be things of thought" (Rancière 2009, p4-5). Rancière aims to radicalize "confused knowledge", as the identification of knowing with not-knowing. This identity between knowing and not-knowing, between activity and passivity, is the very fact of art in the aesthetic regime; it radicalizes what is called "confused clarity" into an identity of contraries. Beginning from such a framework we come back to the problem of the imperceptible in Antarctica through the aesthetic regime. The question of Antarctica's representation involves a presupposition of a realm that is not possible to know because it is remote and immense, which is related to the problem of the Anthropocene in the same way, as we cannot know what the evolving catastrophe might turn out.

As it has been mentioned earlier, the sublime as what is beyond the ability to comprehend is understood by Rancière as a form of representation, a staging, a plot. But, is there another form of understanding the imperceptible? Is it possible to formulate the imperceptible from what accounts as knowledge, direct thought or experience? Might then, the imperceptible be called not-knowing[2].

Another clarification of Rancière, in *The Aesthetic Unconscious* where he is focused on the description of the unconscious that Sigmund Freud elaborated on, is through an interpretation of art history, particularly in theatre, in the Greek drama of Oedipus. What Freud manages to

---

[2]Yusoff reminds us of the thoughts in "Bataille's and Blanchot's writings", she offers to think of the inclusion of non-knowledge as "the ambiguity" and "the intimacy" of knowledge (Yusoff 2009). For Rancière "non-thought (...) inhabits thought", and "is not simply a form of absence of thought, it is an efficacious presence of its opposite" (Rancière 2009, p32).

prove is that there is no such thing as a meaningless thing, but rather that there is always "something enigmatic in what seems self-evident" (Rancière 2009, p3). For Rancière this approach is a "testimony of a particular relation between thought and non-thought" (Ibid.) that was primarily developed as an aesthetic problem (Ibid., p4), this is why Rancière adduces, that Freud starts from aesthetic examples, in theatre and painting.

Rancière takes us to understand Freud and his re-ordering of experience, where daily details be- came relevant and full of meaning as in the latent content discerned in common expressions. In the same text he traces the distinction between knowledge and not-knowledge, to advert us of the shadow that every word casts over knowledge, the shadow of everything neglected, discarded, discredited, disregarded as knowledge, that which is everything else than knowledge. Rancière calls for the active integration of these strains of non-thought [3].

According to the reading of Rancière (Ibid.), Freud considered the unconscious as the insignificant, the daily, the hoax and describes it as a form of knowledge "that does not know" (Rancière & Murphy 2002). Coincidentally, the unconscious expresses itself aesthetically, that is, throughout systems of forces and relations. Thus, the practice here presented will be suggesting a redefinition of access as non-hierarchical aesthesis. Rather than acknowledging the Kantian distribution of access as direct perception and knowledge related to speech and writing, access will be conceived as the not-access, as responses, changes, accretions, or on Ranciere's terms, as silent speech. "Baumgarten's definition of the sensible as a "confused" idea with Kant's contrary definition of the sensible as heterogeneous to the idea. Henceforth confused knowledge is no longer a lesser form of knowledge but properly the thought of that which does not think" (Ibid., p6). In line with these considerations is the work that will be described in the next section.

---

[3]Bataille named the "nonknowledge" as that which is discarded and considered not being part of knowledge. As Kathryn Yussoff puts it,"is part of the pact that we make with knowledge. This nonknowledge is for Bataille a form of excess that challenges both our thinking and our ethics and it is not simply a matter of admitting we do not know all the difficult answers to living on a dynamic planet. For Bataille nonknowledge is that part of human experience that is excluded or expelled, because it is seen not to contribute to knowledge, even though it is experienced and is thus the most intimate form of knowledge (Yusoff 2009, 1014)

3.2   Non-site

3.2.1   Crossing a border with a yeast culture (2016). Austral Summer 2016

Chacalluta, border between Chile and Perú $18°18'37''S, 70°18'50''W$

The geopolitical border was explored in a visit to the desert between Chile and Peru, it was possible to perform experiments with local bio-cultures and cross the border porting a living device. I consider it as a non-site experiment. On one side the experiment is made on the road, using the condition of transit as part of the observation or "agential-cut". These explorations involved the recollection of local yoghurt and yeast cultures and perform observations such as border-crossing activities with the cultures travelling inside a Petri dish. The aim was to think of a portable biological unit to render non-human observations while travelling. To observe diverse embodied responses, bio-cultures as yeast and yoghurt were used as sensors and as methods of observation.

> The number of issues that this experiment explores multiply, interface, geopolitical borders (...) the variations of temperature are affecting ostensibly the growth of the yeast culture, but is it only affected by temperature? Why do I abstract only one property from a living evolving organism? (Research Diary, 03/02/2016)

> Fresh yeast is used as a sensor open to changes of temperature and to all other possible ranges of frequencies. Sound was recorded using piezo microphones on the base of a Petri dish. Sound waves are recorded when sugar is thrown over the mix, a reaction of effervescence is triggered, and maintained for over an hour. Photographs are taken by intervals. The difference of ebullience are estimates of a measuring of moments (Research Diary, 28/02/2016)

> The methods used included direct observation of living cultures, yoghurt and yeast, high contrast photography were used as part of the method after field work. Sound exploration through the use of piezo sensors on the Petri dishes. In this form I would have sound as a mimetic agent, as a direct, analogue correlate of the biochemical reactions. Other direct observations are annotated as odour and tactile consistency.

> I take photographs of the different changes that occur, in particular those observed
>
> in yeast through reactions triggered with sugar (Research Diary)

The experience had several stages, firstly the induction of a reaction in the culture, through the use of sugar. This agent triggers a reaction of fermentation that manifests as effervescence in the culture characterized by the presence of a variable number of bubbles. Bubbles may as well be considered as memories as the bubble encapsulates a moment of time. Glaciological studies in Polar areas, in particular the study of ice cores are also a simile to this consideration. The bubbles alternate as systems of memories during fermentations. Whereas the bubbles in the ice cores are considered as archives of the atmosphere of ancient time, the bubbles in the yeast culture metabolize sugar and incorporate the present atmosphere.

> Mute writing, in the first sense, is the speech borne by mute things themselves. It
> is the capability of signification that is inscribed upon their very body, summarized
> by the "everything speaks" of Novalis, the poet-mineralogist. Everything is trace,
> vestige, or fossil. Every sensible form, beginning from the stone or the shell, tells a
> story. In their striations and ridges they all bear the traces of their history and the
> mark of their destination (Rancière 2009, p34).

Thus, as a consequence if, "everything speaks", the abolition of the hierarchies of the "representative order" is enacted, dismantling at the same time the polarity between knowing and not-knowing (Ibid.). The bubble "knows" in a silent manner. It incorporates the environment, fixing it through metabolic processes. The bubble has access to the environment, through instances of not-access, as in the molecular exchanges. I may be able to observe changes and patterns, as non-human writing.

I have used sound to inform of the changes triggered during fermentation. How can an aesthetic response relying on sonification acknowledge the problem of ontology? I contest that the diffusion of the sounds addresses the problem of ontology as presences that move. *Antarctica 1961-1986* is presented as a representation of this problem, of the traces left by ontologies that withdraw from visibility.

3.2.2   Antarctica 1961-1996

The pollution of radionuclide isotopes in Antarctica, exemplify a contemporary form of the sub-lime. It is not possible to know how those isotopes got there however we know they are a human trace. Antarctica 1961-1996 is a quadraphonic real time sound installation[4] using Free Libre Open Source Software. It is composed of a network of elements including a handmade map of Antarctica made of a conductive thread embroidery on canvas enabling the visitor to play with the soundscapes recorded in Greenwich Island in 2009. A Theremin sensor connected to the threaded antenna allows for modulations of the soundscapes diffused by Pure Data software. It is a real-time performative instrument that reflect on an speculative period of time. The time between 1961 and 1996 may be considered as the period of atomic activity in Antarctica. 1961 is documented as the year when a reactor unit was built in Antarctica during Operation Deep Freeze in McMurdo base (US) which lasted for 10 years and had atomic failure and leakage (Inc 1978), (May 1990). 1996 is arguably the year where the last Automated Weather Station fueled with radio active isotopes (SNAP units) was dismantled to comply with the ban over atomic activity in the Antarctic Treaty System (ATS) (Lazzara et al. 2012). The speculation inquires into this period considering the geological half life of Plutonium (239Pu 24000 years,240Pu, 6560years), Americium (Am241, 432 years), Strontium (90St 28.8 years) and Cesium (137Cs 30.17 years) present in Antarctic matrixes (Jia et al. 2000).

This work has been realized in 2017 including field recordings of Very Low Frequency sounds and Weddell seal sounds realized in Antarctica in 2009. Antarctica 1961-1996 was created for the exhibition Otros sonidos, otros paisajes curated by Leandro Pisano in MACRO Rome. The intention was to produce a work based on my recordings in Antarctica in 2009 and bring it a step forward into the questions I am currently researching which include interrogating the sub-lime and the imperceptible, as the imperceptible is located beyond the ability to comprehend and presuppose a division of knowledge.

---

[4]Sound in soundcloud:
https://soundcloud.com/elpueblodechina/focas-weddell-comunicacionesvlf-macro-2-canales
https://soundcloud.com/elpueblodechina/focas-weddell-macro-2-canales

These questions develop a notion of imperceptibility that involve ontologies. In example, an invisible trace of a military operation and of technological accidents sedimented as radioactive isotopes in Antarctic ecosystems. Materials employed in the work include, GNU Linux, Pure Data, Raspberry Pi, conductive thread, Theremin sensor and sound spatialization known as quadraphonic sound.

Figure 3.1: Antartica 1961-1996. 100 x 60 cm. Map. Hand made embroidery with conductive thread making an antenna for a digital Theremin sensor. Arduino board, Pure Data, Debian GNU-Linux.
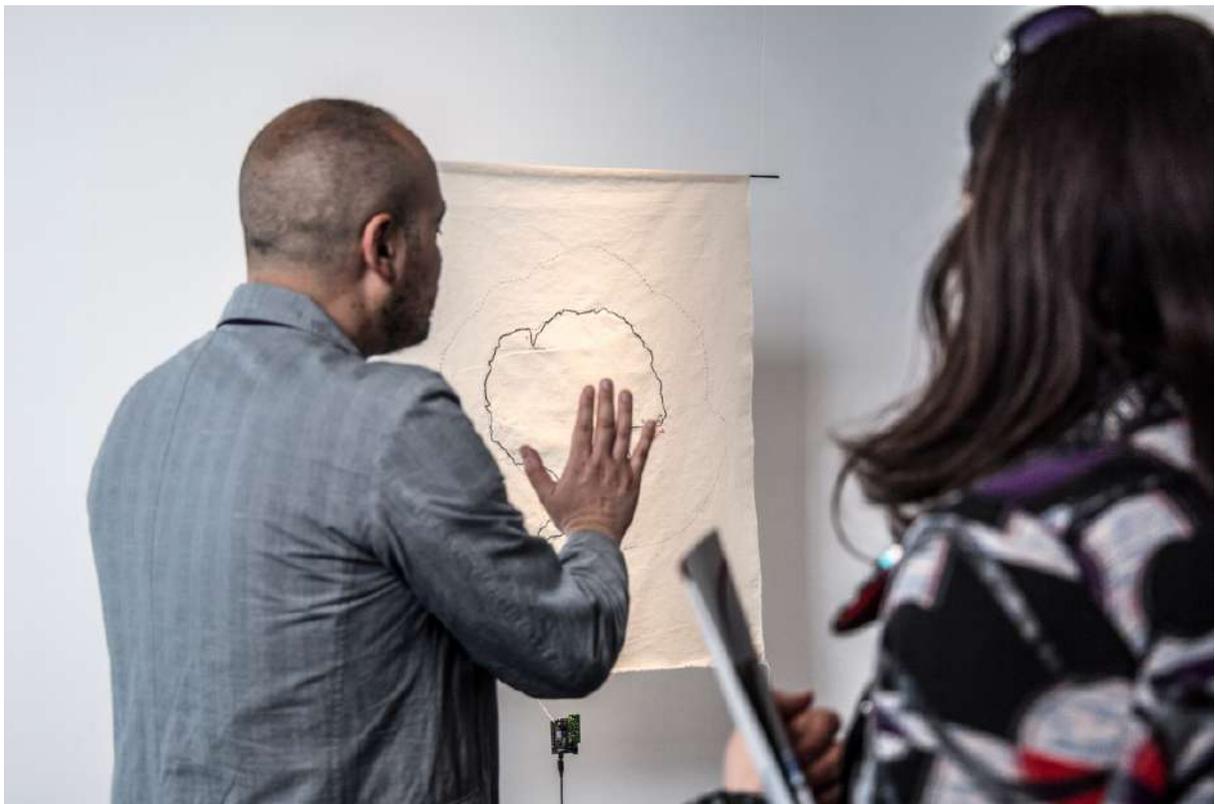
Figure 3.2: Antartica 1961-1996. 100 x 60 cm. Map. Hand made embroidery with conductive thread making an antenna for a digital Theremin sensor. Arduino board, Pure Data, Debian GNU-Linux.

Lactobacillus vaginalis in agar plates as an aesthetic response (2017), was an experiment and an attempt to develop an apparatus that is able to manifest changes independently from the human and that at the same time is very close to the human organism. Similar, to the unintended skin rash experienced during the visit to Lordship Recreation Ground, the Lactobacillus culture present in vaginal fluid is a symbiotic other, implying that it shares a close relation with the human host, of a very tight intimacy but still different from the host.

The experience was realized at the Jardin d'Alice brewery, an autonomous brewery of the local squat in the neighbourhood of Montreuil. The project of the brewery was to cultivate Lactobacillus to add it to the fermentation mixture to brew beer. It involved a queer configuration of the collective production of beer in an autonomous space, considered along the practices of playing gender roles and queer micropolitical activism. The brewery collective project was composed of young activists working in the field of autonomous practices such as fermentation practices, psychedelia, maker culture and queer sexuality. The experience involved the cultivation of various strains of Lactobacillus from six female participants. The cultures were cultivated in agar plates after 48 hours of activation in a rich milieu of yeast extract.

After this period, the original sample activated by yeast extract was transferred to the plates with a seeding procedure. Lactobacillus appeared after 24 hours in the agar plate stored in room temperature of 23 degrees. It proved to manifest visible changes in pattern. After 24 hours it was stored in the fridge. It didn't survive to live outside the fridge and in the trip from Europe to Chile it was colonized by mould. The experiment with Lactobacillus may be seen as a model to experiment sensing with the female body in Antarctica. It can also be thought as a non-site of the human in Antarctica.
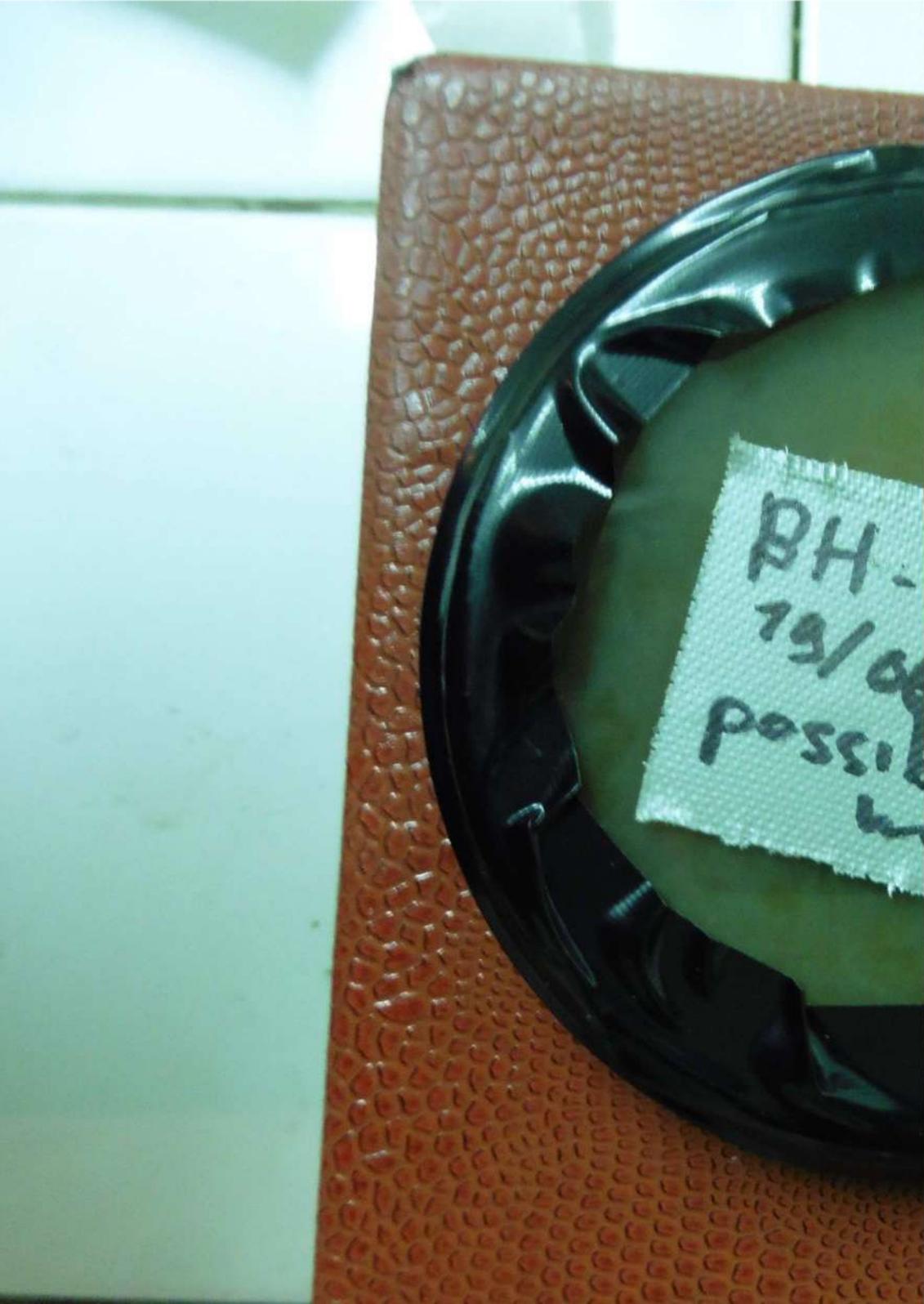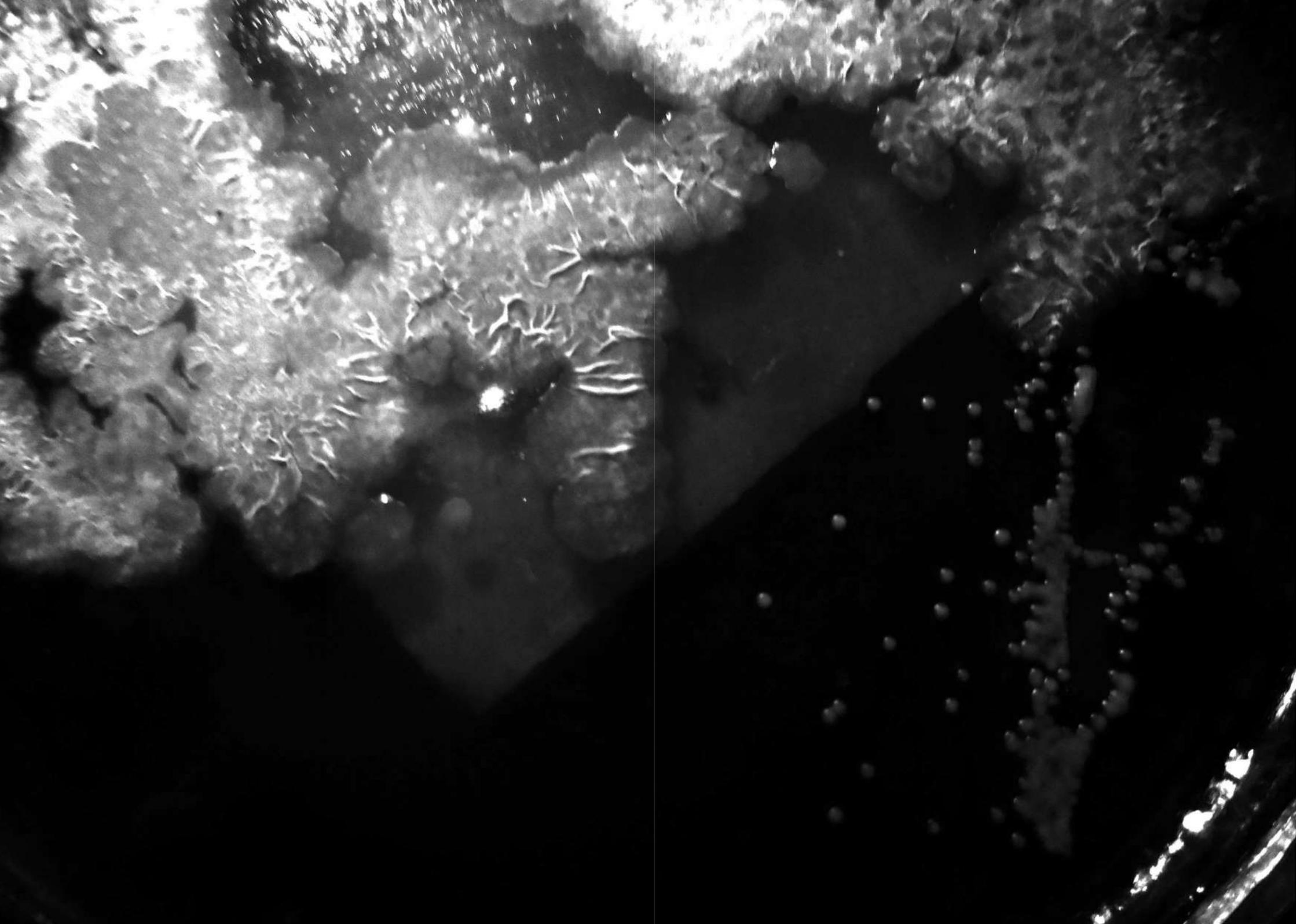
3.3 Polar pollution

3.3.1 The Balfron tower, 2014

The methods used in this exploration involved sound recordings of electronic appliances in the building using an electromagnetic pick up coil. I made these recordings immediately after my arrival to the UK in 2014. The experiments were made under a search for the imperceptible, as the electromagnetic ghosts from the architecture and domestic appliances.

> Measurements of site while living on the 19th floor of the Balfron tower, a "Brutalist" icon of social housing in London. The building was partially inhabited and was being refurbished. The tower is placed in a ring of highways of one of the entrances to London from a subterranean highway. The noise was constant day and night. I became aware of a story of suicide and the spot where the body fell, leaving a trace of the shock. I made a series of recordings with a focus on the imperceptible to be performed in cities. I captured the sound of electromagnetic objects inside the elevator and the electronic door in the building, using a transducer, an electromagnetic coil or "pick up coil" (Research Diary, London, October 2014).

> Electromagnetic sounds were recorded in the hallways and inside one of the apartments, combining public infrastructure with private household electronic appliances. In those explorations a point of view was developed that led to searching for similar urban locations in the periphery of the city. The subject explored was the electromagnetic ghost as pollution in urban site which subsequently led to considering them as extreme or polar-sites (Research Diary, London, October 2014).

3.3.2 Exploration to Pali Aike Volcanic Field and Ana Lagoon, Austral Summer 2016. Pali Aike volcanic field. Patagonia Chile-Argentina $52°06'00''S, 69°44'00''W$

The exploration to Ana Lagoon is considered as a background of the investigation of the polar as polluted since the site is on the border between Chile and Argentina and is surrounded by

anti- personnel mines. The methods used in this exploration included, pH detection of saliva and urine. Yoghurt used as sensor. Ultraviolet light and luminosity graphs. Video documentation.

> We are now in a Pleistocene-to-Holocene volcanic field in Patagonia on the Chilean-Argentinian border. We arrived just on time to pitch our tent and eat, as the winds are very strong. I made sound recordings of the wind and wished to have an anemometer. I woke up very early in the morning to record a video of the sunrise. It was freezing cold and my stiff hands made it difficult to operate the camera. Media objects are unfit for the body in extreme conditions (Research Diary)

> My plan is to perform, ultraviolet detection, decibel detection, sound recordings, luminosity detection, urine pH test, saliva pH test, yoghurt and urine observation and video performance The themes explored are, imperceptible quanta, subpolar exploration, mimetic sensors. The approaches taken are detection and photographic registration, sound recording, video recording, video performance, collaboration, knowledge contamination (Research Diary)

> If I think of my urine, all the experiences, conscious, unconscious or subliminal may have a correlate in the residues contained in my water fluids. I perform detection of its acidity using pH paper. The final insight of my experiments in Ana Lagoon was an iridescent film of urine seen as a sensor.

> Detection and registration as well as observations were conducted in the volcanic land plane as well as in Ana Lagoon. Black and white photography was realized but it contained errors, mechanical errors with a visual signature, nevertheless it will be used as a coherent witness of the experiences undertaken. After developing these photographs I begun to think of error as a sensor, just like juxtaposed/diffracted text may be considered erroneous text and a direct, material method. (Research Diary)

These series of experiments performed in Ana lagoon led me to make a connection between the yoghurt culture and my body fluids. While observing the Petri dish with the yoghurt I was also observing the visible variations triggered by the wind. It is the same with my saliva and my urine, they change in contact with the environment. They are traces of my biological self.

> Observing the urine I realize the formation of structures on the surface of the liquid. Visible reactions as changes of colours are observed. I learned I can use my body fluids as sensors, the manifestation of mineral particles and biological symbionts in my fluids is my nearest experience of the non-human. (Research Diary, Pali Aike, 10/01/2016)

Imperceptible pollution was also researched in field work in subpolar areas using the body as another sensor of the environment. In Pali Aike volcanic field the main activity was to record ultraviolet light and store this information in arrays of data as fluctuations of values. During this process of sensing of the ultraviolet light performed on a windy open air, I felt, my skin was part of a general sensation of luminous pressure. The body was set into direct contact with the land. In addition to the UV recordings, body fluids were utilized such as saliva and urine, to think of these fluids as intra-acting within materiality.

pH measurements were made to these fluids but after obtaining a sample of urine, I noticed the iridescent surface of the urine plate. Could this be a sensor, or a type of interface to this site? The iridescent surface vibrates with the wind. Could this film that is forming on the surface of this body liquid, be informed of this site? Would it contain any material correlate with what I saw on the journey to here? Would it be informed by the signs of mined military facilities in the surrounding areas? Are my body fluids sensitive to the geographical frontier between Chile and Argentina?

> A film of urine was used as a sensor. I made a video performance focused on field detection of landscape through urine. It was the first time to test it and it proved to be reactive. I noticed changes of colour and consistency as the liquid vibrated on the surface with the wind. The surface revealed colloidal textures as a membrane was quickly forming, perhaps reacting to light? (Research Diary, Pali Aike, 10/01/2016)

3.3.3   Lordship Recreation Ground. 2016. Broadwater Farm sewage pond, London. Coordinates: $51°35'40''N, 00°04'55''W$

A site was chosen in an urban location, Tottenham's Lordship Recreation Ground served to test the living sensors on site. A one-acre empty patch next to the council housing Estate known as "The Farm" in the London Borough of Haringey. The Lordship Recreation Ground was meant to serve as a recreation facility for the council housing Estate. The Moselle river goes under the terrain that is historically known for its tendency to flood. Haringey is a Borough that developed along the train lines, hosting generation after generation of workers whose social and housing conditions in the XIX century were deplorable. In the last twenty years, Broadwater Farm has been a site of confrontation between locals and police forces and lately its demolition has been announced several times. The Lordship Recreation Ground is part of Broadwater Farm. In both sites, one next to the other, detection of ultraviolet radiation was executed as well as infrared photography. The visits included walks and detection activities inside the courtyard of Broadwater Farm and in the park known as the Lordship Recreation Ground.
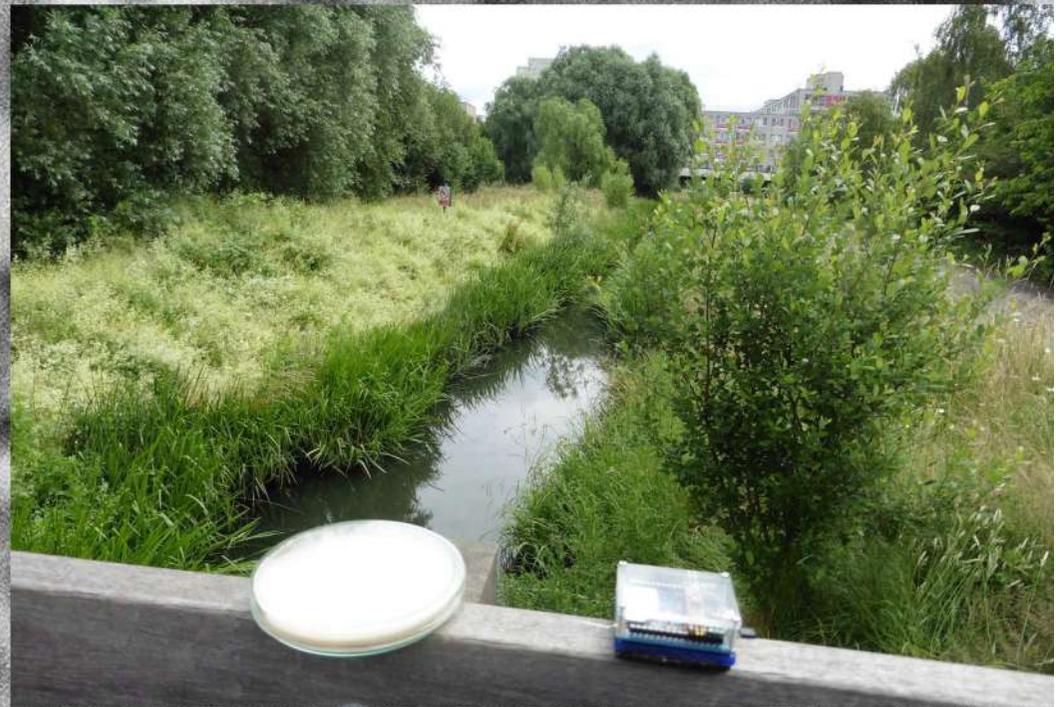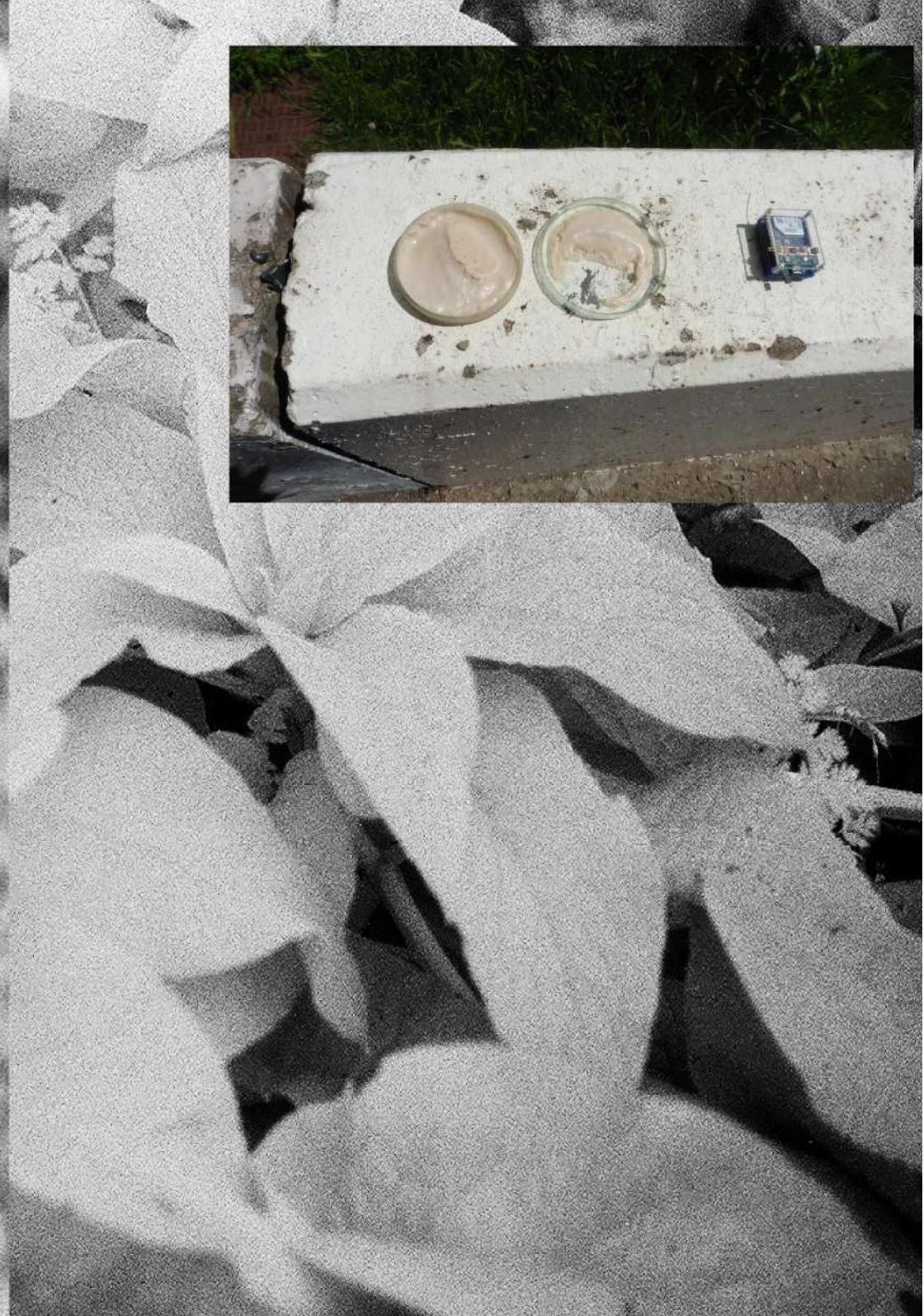
Infrared Photography

The studies of the Lordship Recreation Ground using infrared photography revealed invisible dimensions of the site. The photographs depicted presences unknown otherwise because of their plainness and insignificance. Fields, water plants, birds on the fields, clouds, Tottenham and "The Farm" buildings. The process triggered important insights about the working definition of the site. A new definition emerged, that considered the site as the declaration of an array. Processes will be rendered according to each of the instances invoked in the array. Site is diffracted space as rendered by a hash table.

3.3.4   Explorations in Punta Arenas. Austral Summer, 2017

The methods implemented included Crystal Radio sensing (Galena) using urban infrastructures as part of the electronic circuit. The experience took place along Rio Las Minas, a river that crosses the city of Punta Arenas. Houses are built along the river border, placed two and three storeys above the river bed. In some places, it is possible to see the river border, and only in a few spots, it is possible to access the metal structure that channels the river. The aim was to listen to natural radio in the amplitude-modulated frequency range. For this, a simple electronic circuit powered by electrostatic electricity was used. Commonly known as crystal radio it is a primitive form of a radio receiver. The river metal structure was tested to know what part of the circuit will enable the receiving of radio waves, like the antenna, as a condenser or as ground. Finally, the river's structure was used as ground.

The work consisted of processes enabled by trial and error as well as exploring the border in the city. The river border counts for a certain periphery of the city and in this sense, it is considered polar. The act of detecting radio waves using the river metal structure may be considered peripheral to the sort of activities that a river would elicit to do. The action is performed to explore the river infrastructure on an electromagnetic dimension. The practice is to render explicit the electromagnetic dimensions of the city and the exploration of new uses that enable the surge of a fictional city. A city where all the fragments, the pollution, the missing people, the nature of the river converge in the electromagnetic.

3.3.5 Place of execution, 2016. River Moskva, Moscow (to the site of the activist's assassination) Coordinates: $55°44'56''N, 37°37'28''E$

The same exercises with yeast performed in Arequipa, Peru, were implemented in a visit to the site of the assassination of the activist Boris Nemtsov in Bolshoy Moskvoretsky Bridge in Moscow. The impossibility to access, in the Kantian sense of access as direct perception, the event in central Moscow at 23:31 local time on 27 February 2015 (BBC News 2015), was considered similar to the problems placed by the Antarctic site in the sense of being remote (in space-time) and polar, conceived as polluted. What was developed consisted of an apparatus to respond to an imperceptible violent event, because of a different space-time location and because of political dissimulation?

The yeast was portrayed before going to the site and after being there. The site is on the side of the red square, on the bridge over the river Moskva. A site of murder was considered a polluted site. Contaminated by violence and political repression, a site under intense surveillance and recurrent insurgency against Vladimir Putin. Nemtsov was assassinated during a march against Russia's war in Ukraine, and the perpetrators remain unjudged. The site on Bolshoy Moskvoretsky Bridge is marked by an improvised memorial adorned with flowers and candles, maintained by daily volunteers.

Pictures were taken after visiting the site, that later were processed and used as monochrome images of high contrast that were analyzed using Image Magick software. The analysis consisted of a reading of the image's RGB values stored as raw data that were exported as an audio wave file by Audacity free software sound editor. The technologies involved in the sonification of patterns in yeast and yoghurt cultures consisted of command-line applications executed in a chain.

Sonification of patterns

The problem of lack of access to the object of study was engaged with a detour. The problem of access was redefined using a proxy ontology to perform such access. The plate of fermenting

yeast carried to the site of the activist assassinated is a form of not-accessing that integrated the visited site into its metabolic process. This has an ample meaning, and the concept of the matter of Karen Barad was taken into consideration. Matter as molecules and electromagnetic frequencies, and political issues and war are latent in the visited site. The access to the polluted imperceptible is performed by a more-than-human ontology.

The sonification of patterns found on fermented yeast plates that were produced after the visit to the site of the assassination of an activist was thought of as a sequence of combinations of not-accessing and accessing the problem. In other words, such an apparatus combined indirect perceptions with technologies of knowledge such as software in a chain that may be seen as sequences of not-knowing and knowing. As the high contrast photography rendered a visual pattern, the sound brought rhythmic patterns as well which were obtained following a sequence of not-knowing (yeast pattern), knowing (software), not-knowing (sound).
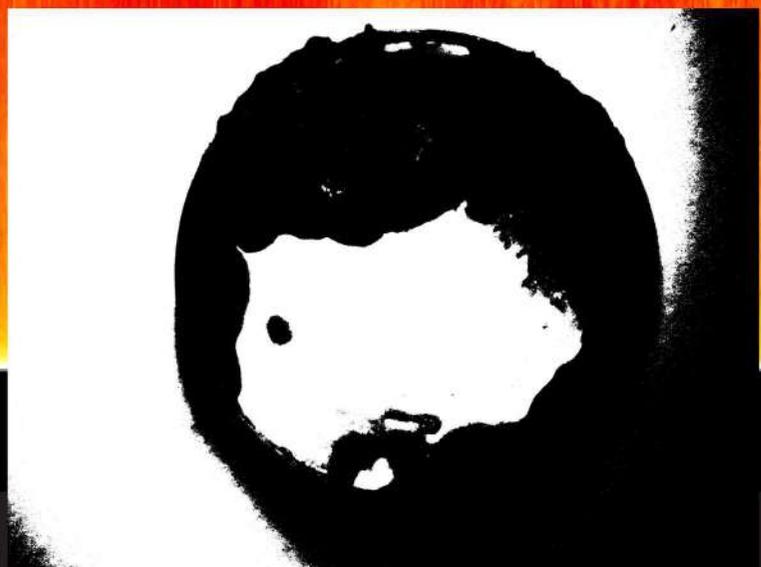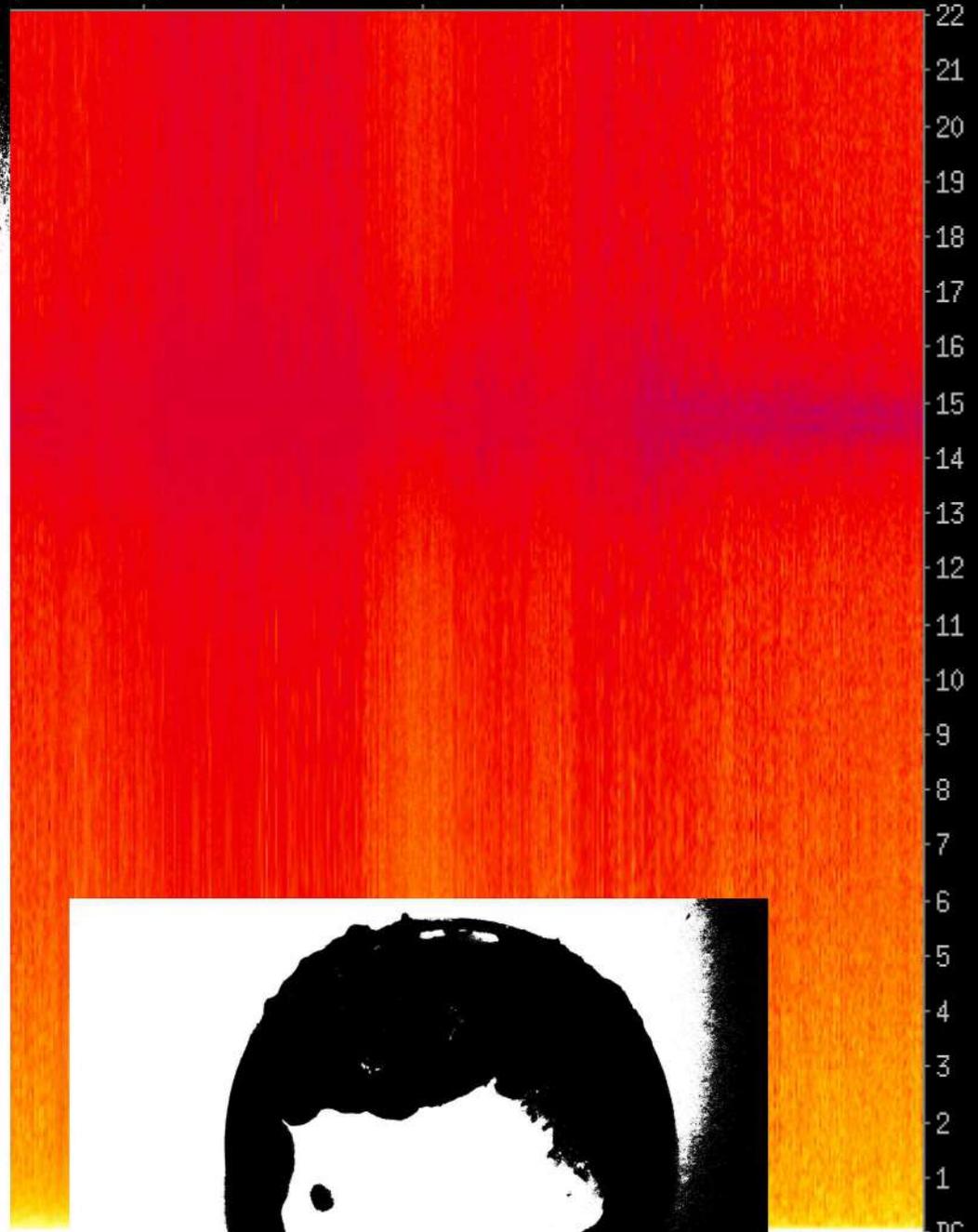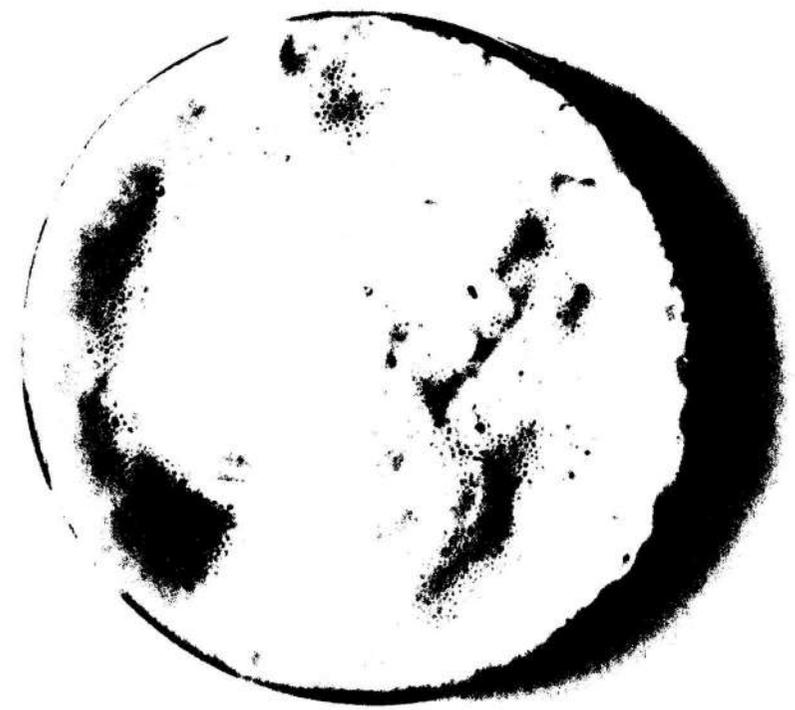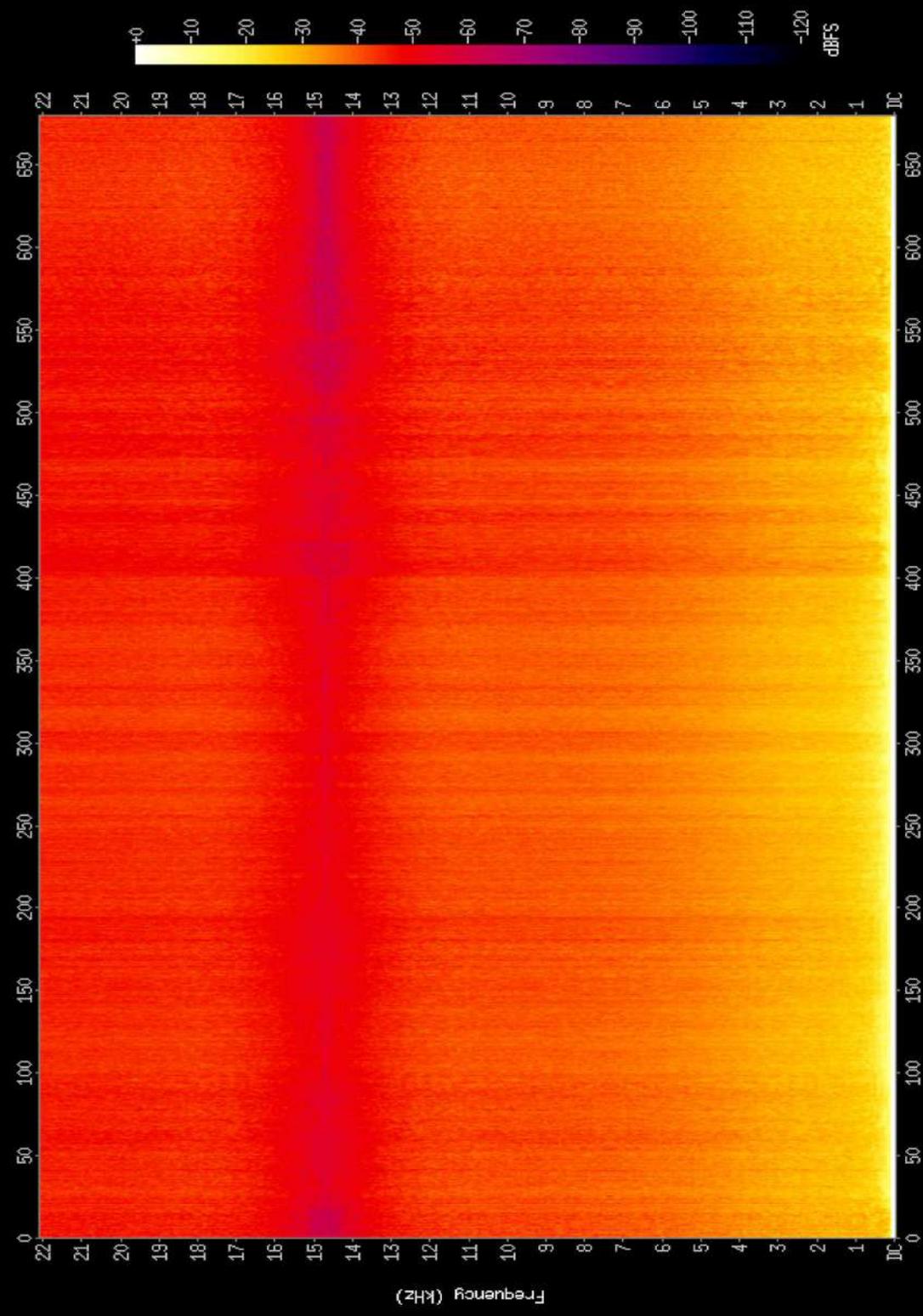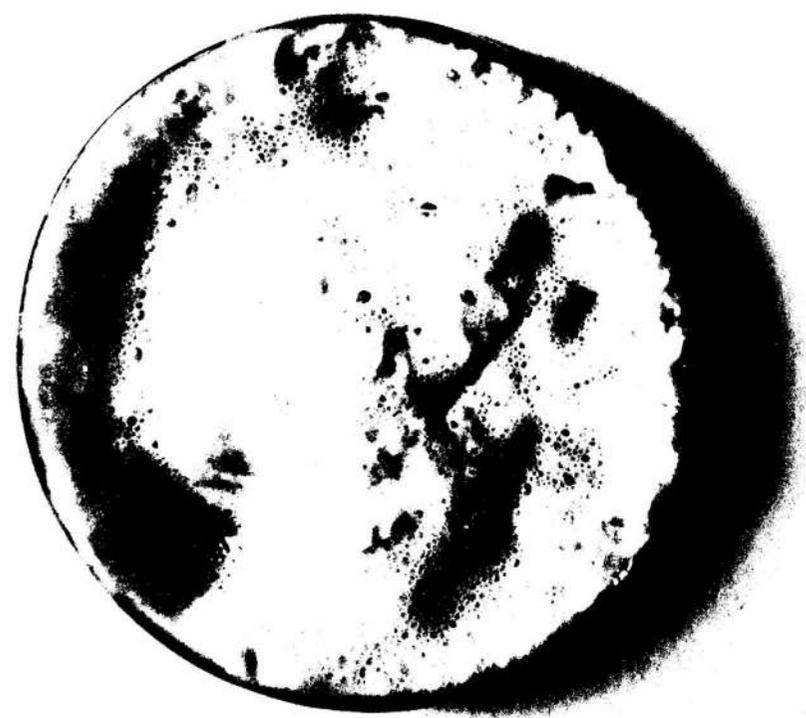
3.4   A comparison between the aesthetic regime and sym-
poiesis

Prior questions about the possibility to respond to Antarctica beyond normative and sublime representations have derived into scrutinizing the notion of the imperceptible to unfold the hierarchical orderings implied in representation, the divisions between "high and low subjects and genres", "the Aristotelian superiority of actions over life", and the overpassing of the "traditional scheme of rationality in terms of ends and means, causes and effects" (Rancière 2005, p14).

These divisions have often entailed the location of the human as the rational centre and the subjugation of all other forms of being to him. It implies as well the superiority of the organic over the inert. We may argue that the Anthropocene[5] places de human at the centre of things, performing such a scheme that shows the human occupying the central locale of a geological era. Man as the master of all living things, executes a mark on the geological scale, situating him next to the non-human and geological.

Danowsky and Viveiros do Castro identify nine biophysical processes of the terrestrial system that if reached would provoke major alterations unbearable for many species including

---

[5]For J. Crutzen and Eugene F. Stoermer, it is relevant to speak of an Anthropogenic signature in the changes reported during the last part of the Holocene. These changes include the increment of the population to 6000 million, with the additional rise of cattle population that accompanies humans, to 1400 million. The large effects of urbanization and the impact of the use of fossil fuels, that has also increased tenfold, "exhausting" fossil fuel deposits that took million years to accumulate. The release of $SO2$ to the atmosphere due to the burning of fossil fuels is estimated globally in "about 160Tg/year" (Crutzen & Stoermer 2000). Nitrogen is fixed at large artificially in the fertilizers of agrochemical products rather than done naturally. All of these aspects constitute the discussed anthropogenic signature and constitute the claim for a new geological era. The initial date of the Anthropocene is the later part of the XVIII century which coincides with the date of the invention of the steam engine in 1784. Relying on coal as its source of energy, this event initiated a signature in the atmosphere shown as large variations in the biotic pattern of lakes (Ibid.). Crutzen and Stoemer also provide a historical review of the concept pointing out that the term Holocene (Recent Whole), was first coined by Sir James Lyell in 1833, while already in 1864, G.P. Marsh published the book "Man and Nature" focusing on the influence of human activities over the landscape (Ibid., p17). Additionally, their formulation was preceded by other attempts to recognize the human as a force capable of shaping the Earth, they refer to the Psychozoic and the Noosphere. Crutzen and Stoemer, point out the role of human activity over the "scarring" of the Earth. For Crutzen and Stoemer, the Anthropocene represents a new phase in the history of both humankind and of the Earth, when natural forces and human forces became intertwined, so that the fate of one determines the fate of the other, "mankind will remain a major geological force for many millennia, maybe millions of years to come" (Ibid., p18). Crutzen observes that the intertwining of telluric and human forces has no precedent in the history of the planet, he adds, "geologically, this is a remarkable episode in the history of this planet" (Zalasiewicz* et al. 2010, p2231).

our own, these nine processes are, climate change, acidification of the oceans, diminishing of stratospheric ozone, global use of water, biodiversity loss, interference with the Nitrogen and Phosphorus cycle, changes in the use of soil, chemical contamination and load of atmospheric aerosol (Danowski & de Castro 2016, i). While they recognize the fragility of the current environmental situation, they consider themselves aligned with a group of theoreticians that question the anthropocentric approach. The critique is manifested in that the human time-lapse is not comparable with the geological scale. They claim that the Capitalocene, rather than the Anthropocene corresponds to a pattern of extinction of a much wider scale. The Capitalocene has been theorized by Donna Haraway, as a boundary with the Anthropocene, characterized by "immense irreversible destruction" already unfolding (Haraway 2015, p3). She describes it as the "moving material semiotic generativity around the world for capital accumulation" (Ibid., p4). To her, the term Dithering might be even more appropriate than Capitalocene or Anthropocene (Ibid., p3). The term Capitalocene started to be used by Moore(Ibid.). For Moore, the Capitalocene is a historical-geographical pattern (Moore 2017, p326) that "cohere a civilization throughout laws of value (Ibid., p327) that have to do with intensity, scope, scale and speed. Central for the working of the Capitalocene is the accumulation of "abstract social labour" that demands the production of "Cheap Natures", "that can deliver a rising stream of low-cost food, labour-power, energy and raw materials to the factory gates" (Ibid., p328).

Isabelle Stengers recognises the infamous circle of destruction that only leaves free space for capitalism itself, and under no means leaves space "for something more important" (Stengers 2013, p185). The Anthropocene organizes scientific evidence of global warming around a narrative of apocalypse and what authors and cultural activists such as Donna Haraway reminds us is that our societies are actively neglecting the possibility of action against a decaying environment (Haraway 2016). Danowsky and Viveiros de Castro report that for a group of theoreticians such as Donna Haraway, Isabelle Stengers and Elizabeth A. Povinelli the concept of the Anthropocene is considered anthropocentric, and a geological concept used merely under a "denotative meaning" giving the Homo Sapiens "a destinal (even if only destructive) power over the planet's history" (Danowski & de Castro 2016). For Donna Haraway, the ecosystems of

this planet should be considered damaged but "still ongoing worlds" (Haraway 2016, p59). The central role that mankind occupies in the Anthropocene may be analyzed as a theatrical space, where the apocalypse is staged by the protagonists, humans, global warming and plutonium. Also, the Anthropocene may be seen as a case of a paradigmatic problem, largely known as the problem of the sublime. The Anthropocene would be the representation of the unknown in the field of earth science. As such, it corresponds to a type of representation among other possible responses. Nevertheless, this type of representation is based on a hierarchical distribution of thought and knowledge that plays at the same time with too much to say or a surplus availability of data (Yusoff 2005), with not wanting to know, not wanting to say and saying without saying. The Anthropocene is a case of the "pathos of knowledge" according to the concept of Jacques Rancière.

Unknowability has been analyzed by Jacques Rancière as a display of forces, an ordering of experience relative to not wanting to know and not wanting to say, as the latent politics of the sublime. It is an idea to test against the fact of the superabundance of data from computer satellites such as the Sentinels or such as the RADARSAT. As it was described in the contextual review, the satellite map of Antarctica is composed of 40000 images that were normalized and stitched together. The process of normalization implied in the making of a homogeneous surface, involved the removal of a great amount of data (Yusoff 2005). Too much to say may be compared to the millions of discarded pixels. Saying without saying may be set aside the computer imaging processing that renders a sort of image of Antarctica that relates it through its digital qualities to other remote landscapes such as the Grand Canyon or the surface of Mars (Ibid.). These digital atmospheres dissimulate other schemes such as war, surveillance, and the third age of exploration to outer space (Pyne 2016). On the other hand, Yusoff's readings of climate change and the operations of "radical uncanniness" that Rancière attributes to aesthetic practices (Rancière in Yusoff 2008*b*, p17) allow (us) to consider an "aesthetic of contingency" for "making worlds through interaction, relation, interrogation and imagination" (Ibid., p18).

Concerning these critical views of the Anthropocene, we may characterize another model, where

entities do not have boundaries as they are processes contingently intra-acting. Sympoiesis rather than of autopoiesis is proposed by Haraway, by the collective production of "systems that do not have self-defined spatial or temporal boundaries" (Haraway 2016, p58). To differentiate autopoietic systems from sympoietic systems, the former consist of units that self-preserve, tend to homeostasis and are predictable. While the latter "always partnered" don't have beginning or end units thus information and control "are distributed among components" (Ibid.). Haraway recognizes the "porous tissues and open edges" of an exhausted planet but calls to account for the relations between relations and to be attentive of the ideas we use to think of other ideas, citing the work of relational ethnographer, Marilyn Strathern (Ibid., p60). For Haraway, the Anthropocene times "are times of multispecies", of living together with mass extinctions and disasters. The problem, she observes, are the "self-indulgent and "self-fulfilling" myths of the apocalypse. She calls this an epoch of "unprecedented looking away" instead of being responsible.

She makes then a relation with what may be thought as the sublime, since she refers to a time of "unpredictable specificities" that are taken as foolishly as "unknowability itself". Is it possible to engage with Antarctica beyond the sublime regime of representation? Beyond the Anthropocene? We may consider giving an affirmative answer relying on the system of forces that Rancière invokes as aesthetic responses that he identified as "anti representative art", as art without unrepresentable things (Rancière 2007, p137). The perspective of sympoiesis as declared by Donna Haraway may be interpreted as an aesthetic plot, as defined by Rancière, when describing the revolution of the nineteenth century, specifically in the realist literature. A sensorium, "a specific kind of space and time" reframed to separate it from other "forms of consciousness", it was an attempt to take social matters away from the representational plot, the representational connection of causes and effects and to recast it as an "aesthetic plot", a matter of variation of perceptions, intensities and speeds, just as the novelists from Flaubert to Virginia Woolf did (Rancière 2005, p14).

Rancière refers to an aesthetic revolution that took place in the nineteenth century and that not only involved a change in "the poetic values" but also a whole transformation "in the parti-

tions of the spheres of experience" (Ibid.). It created a sensorium, a redistribution of space and time. This redistribution may be understood as a modification of borders between separated instances.

Sympoiesis for Haraway is a concept referred to relations between relations of entities with no clear boundaries, in this sense the variations and the little perceptions that Rancière recognizes in the literature of realism may be seen in similitude to what Haraway discusses. The variations and focussing on the small leads us to think of a plot of forces, a plot without a story. The sympoietic perspective looks into catastrophe as one, relatively new relation. The Anthropocene, on the other hand, is a representational plot of characters with borders. While the Anthropocene depicts Antarctica as a degrading mass, wreckage, a sympoietic perspective will mean to inquire about the possible coevolution that the changes of Antarctica will signify for the other ecosystems on Earth, Haraway proposes to think about a kind or many kinds of collaborative surviving (Ibid. p64). In this context, an artistic methodology that develops aesthetic responses to geophysical systems are in line with the sympoietic views of Haraway as they may be considered a multispecies epistemology where modes of knowing and of not-knowing enable the access to the imperceptible.

3.5   A focus on combining the phenomenological and the ontological.

Bruno Latour characterizes Louis Pasteur's discovery of lactic acid yeast, as developing between two dramas, one that may be known as ontological, that "modifies the status of a non-human", attributing to it a "heroic character" (Latour 1993, p4) and another that may be known as epistemological, that for Pasteur meant the solution to the "conflict between constructivism and realism", to philosophy of science's problem of progressing from a "non-existing entity to a class" (Ibid., p11). Latour asserts that Pasteur attributes to yeast a process imbued with beliefs as for example, presenting fermentation as a correlate of life and not of death. Pasteur, according to Latour, goes from one epistemology to the opposite of it.

Latour proposes to understand "how he distributes activity between himself, the experimenter and the would-be tentative ferment" (Ibid., p12). Latour characterizes the process of becoming yeast, he interrogates who "is pulling the strings, the scientist's prejudice or the non-human?" (Ibid., p4). He then utilizes his concept of "a name of action", to refer to the impossibility to know what something is but to have access to it by its actions, by the similarity of processes that trigger events and behaviours, "we do not know yet what it is, but we know that it can be sprinkled, that it triggers fermentation, that it renders a liquid turbid, that it makes the chalk disappear, that it forms a deposit, that it generates gas, that it forms crystals, that it becomes viscous (Ibid., p8). "But the name of action" is not a "name of being" which represents a higher ontological status, it is not sufficient that "it acts so much" to become an actor (Ibid., p9). Latour comes back to the experiment set by Pasteur and inquires, "what is an experiment?" (Ibid., p12) other than what the scientist makes for something to appear. He identifies two stages, in one the human scientist is active and in the other the non-human is active, these two planes are identified as narrative planes.

What becomes clear with this case is that the agencies displayed during an experiment are of mixed natures and that the ontologies come to existence according to the name of action, that is, as the processes of defining the processes and the beings that produce those processes and also of identifying a process out of a medium. As Latour points out, is the concatenation and alternation of narrative planes what constitutes a being. This line of thought will be developed later in the section of knowing beyond truth, a radical contingency approach. Antarctica shares in common a condition with the yeast studied by biologist Luis Pasteur and that is theorized by Bruno Latour, as an actant narrative. Pasteur believes there is an entity, as the theory feeds his experiments, Latour comments how he (Pasteur) went on creating the vessels to be able to isolate the agents that he "suspects" are behind the processes he guessed at. In this sense, two narratives converge to generate an entity.

The fermentation cultures of Louis Pasteur and Antarctica hold in common a similar condition,

we know of it by its behaviour, by its actions. Take for example the Antarctic convergence, it is not something that can be mapped into a stable border. However, the traditional way of representation of Antarctica relies on a conception of the continent as a solid entity, that was the interest of the first explorers, to depict it, to circumnavigate it, to reach and conquer the South pole, to make it one defined entity.

A method of radical contingency as claimed by Yusoff might mean the combination of ontology and phenomenology and also the consideration of the inextricable union between knowing and being. Before going into that I find it is necessary that we scrutinize the notion of discovery and the hierarchical dimension that the virtues of knowledge such as objectivity pose. As Lorraine Daston and Peter Galison note the arousal of objectivity is part of a larger schism between the knowledge and the knower, a schism that will be reassessed at the end of this chapter.

A method of radical contingency as claimed by Yusoff might mean the combination of ontology and phenomenology and also the consideration of the inextricable union between knowing and being. Before going into that I find it is necessary that we scrutinize the notion of discovery and the hierarchical dimension that the virtues of knowledge such as objectivity pose. As Lorraine Daston and Peter Galison note the arousal of objectivity is part of a larger schism between the knowledge and the know-er, a schism that will be reassessed at the end of this chapter.

3.6 The question of the alien and hierarchies implied in discovery.

> We think of ourselves as the Knights of the Holy Contact. This is another lie. We are only seeking Man. We have no need of other worlds. We need mirrors. We don't know what to do with other worlds. A single world, our own, suffices us; but we can't accept it for what it is. We are searching for an ideal image of our own world: we go in quest of a planet, of a civilization superior to our own but developed on the basis of our primeval past (Snow speaking to Kelvin in Solaris) (Lem 1971, p75-76).

Discovery is associated with a larger project of objectivity that has been investigated by Lorraine Daston and Peter Galison. They consider that the history of the concept is short, from the mid of the nineteenth century. It became the norm "in a matter of decades" (Daston & Galison 2007, p27). For the authors objectivity operates by means of the synecdoche, that is by taking some qualities as the whole, for example, "emotional detachment", "automatic procedures for registering data", "belief in a bedrock reality", "recourse to quantification", "independent of human observer" (Ibid., p29). An earlier form of the concept might be found about the pair "objectivity" and "subjectivity" meant "things as they are presented to consciousness, whereas "subjective", "referred to things in themselves" (Ibid.). As they continue describing the genealogy of the concept they acknowledge the disappearance of the concept during the seventeenth and eighteenth century (Ibid., p30). And they attribute it to Immanuel Kant to have brought it back to philosophical discourse to use it as, "objective validity" referred to "forms of sensibility" rather than to "external objects" (Ibid.). They also indicate that the difference between objective and subjective for Kant was not the difference between the body and the mind but rather "between universal and particular" (Ibid.). Somewhere "circa 1850" the modern concept of objectivity arrived. The authors point out that objectivity is, in fact, a part of a larger project of epistemology that they phrase as "the philosophical examination of obstacles to knowledge" (Ibid., p32) and that for them may be conceived as ethics since epistemology acts as a "repository of multiple virtues and visions of the good" (Ibid., p33), objectivity for them is one of the epistemic virtues among truth, certainty, precision and replicability (Ibid.) that are used and "preached" in science in order "to know the world" (Ibid., p39). For them, one of the most significant narratives prevalent in scientific discourse is the separation, the "schism" between the knower and knowledge which makes science different from alchemy, for instance (Ibid.).

The "cognitive fetishism" of closed systems, such as in the epistemic virtues have resulted in fixations of knowledge and specific "distributions of the sensible". The assumption of discovery involved in the search of the hidden or imperceptible, conceals a position of power, of the one with the faculty of revealing the hidden. Art representing Antarctica coincides with science in the push for discovery, of visualization of otherwise remote and disembodied territory. Both art and

science rely on a privileged and staged composition.

3.7   Lordship Recreation Ground: A virus infection.

I would like to come back to the work in the Lordship Recreation Ground, the visits included experiments with yeast fermentation which implied long visits near the sewage water pond. As a result, after a visit during the a long morning, I felt a mild fever and the day after I developed a skin rash

> Local neighbors spoke while visiting the site of how the park is plagued with rats. To the point that some people feed them. Frequent visits to Lordship Recreation Ground provided evidence of various signs of an anomaly. The frequent sign alerts about the water and how it should not be used for swimming or bathing, the scattered patches of bread in the garden on one side of "The Farm" building complex. And finally the presence of the sewage water pond that is not signalled as such but only with a warning of deep waters. Nonetheless, the pestilence is evident, but the sensors I was using, focused on the light spectrum could not capture it. (Research Diary, 15/08/2016)

SITE

Under the Health and Safety
all regulations under this act.
to proceed onto the site or a
personal protection and safet

Construction
warn ch

Safet

Fo

Unau

SAFETY

SLC SOUTHERN LANDSCAPE CONSTRUCTION LTD
TEL: 01277 655010

at Work Act 1974 all persons entering this site must comply with
All visitors must report to the site office and obtain permission
ny work area. Safety signs and procedures must be observed and
ty equipment must be used at all times.

on work in progress. Parents are advised to
ildren of the dangers of entering this site

ty helmets must be worn

ot protection & High visibility jackets must be worn

uthorised entry to this site
is strictly forbidden

In another visit to the pond, I decided to observe a fermentation process in yeast to be performed on-site. The results were used along with an unexpected rash of my skin. While there is no proof that the reaction was provoked by the aerial contact with the pond, the symptoms were right after the visit. It started with a short mild fever that was followed by the appearance of the skin patterns. (Research Diary, 21/08/2016)
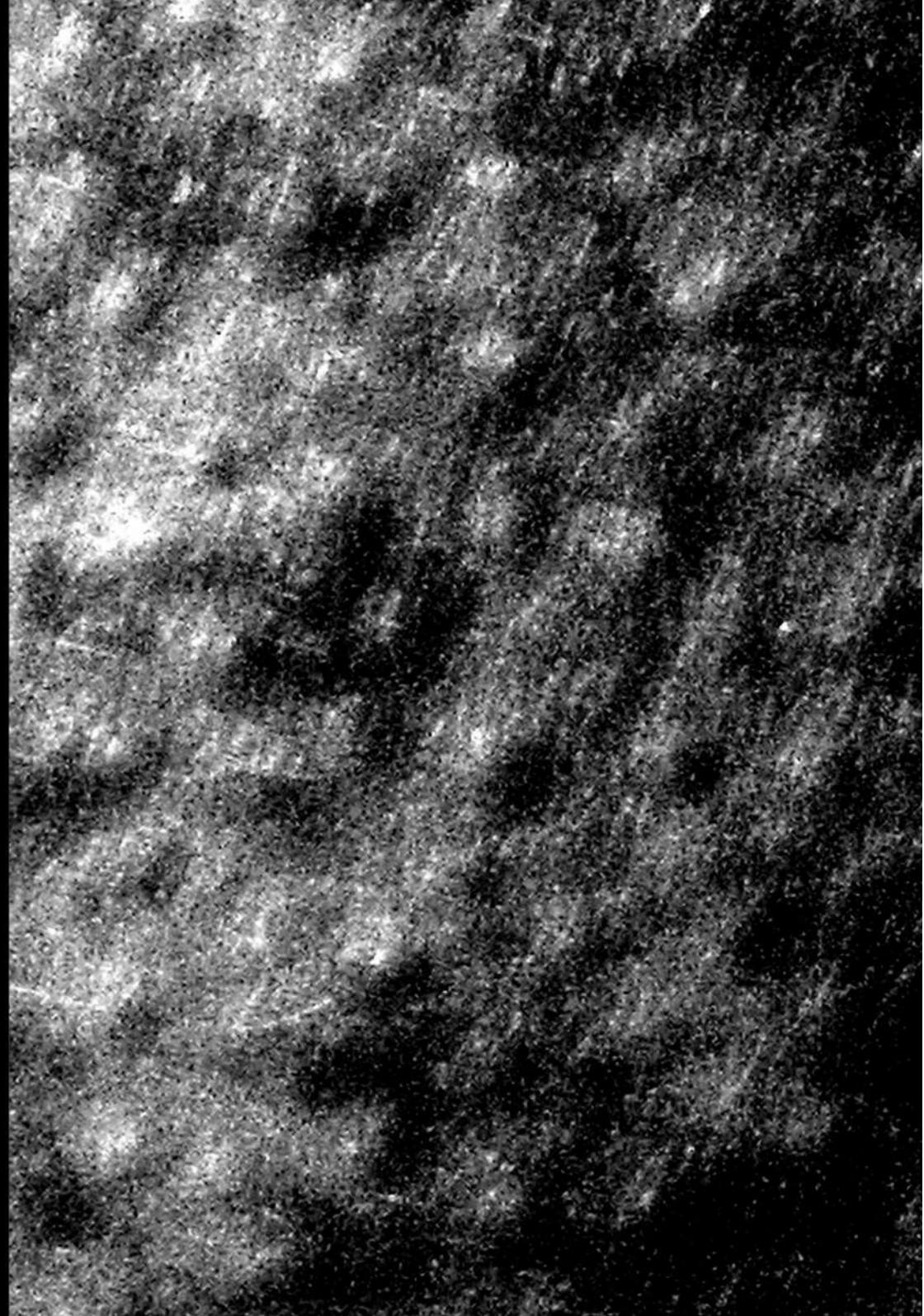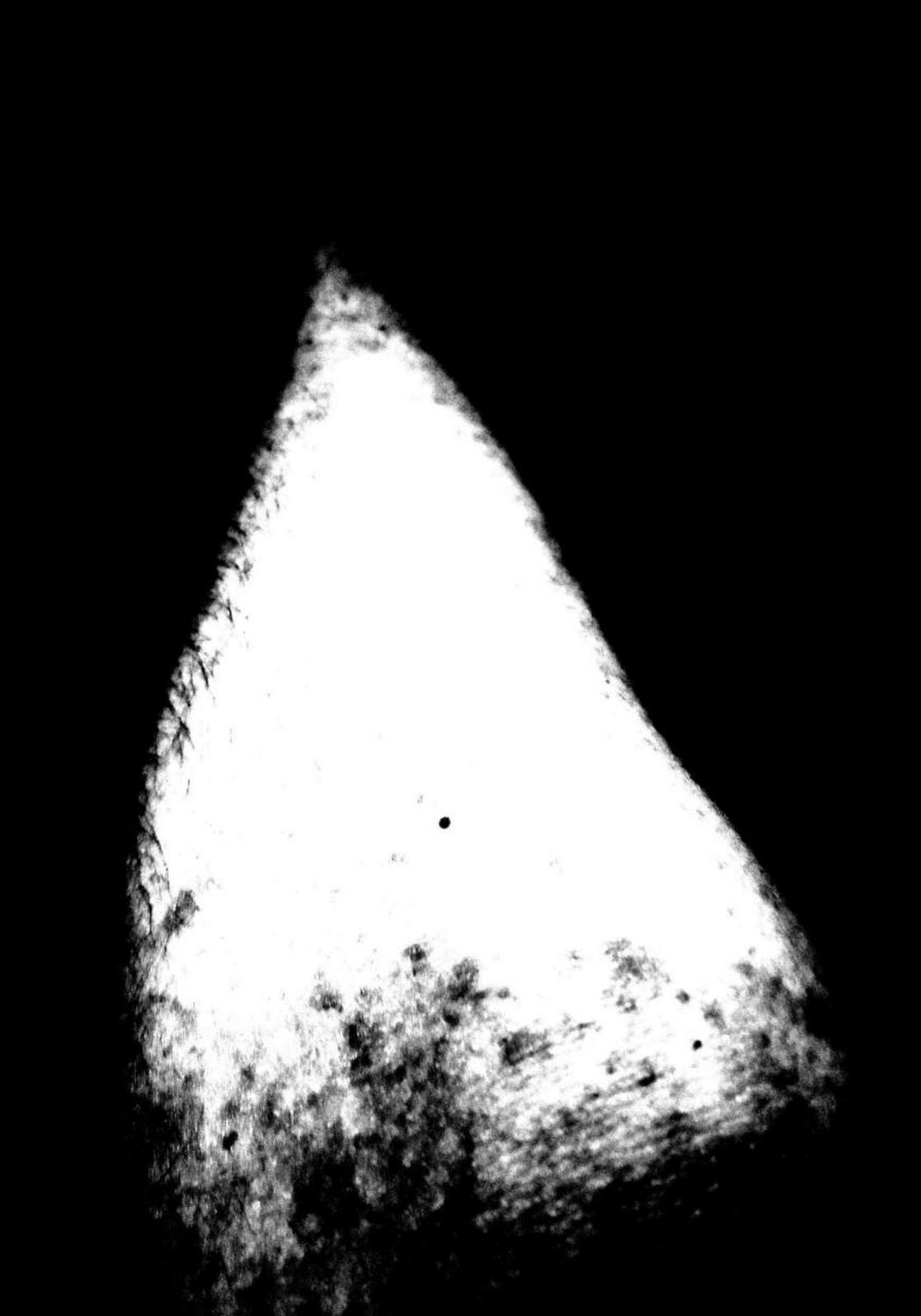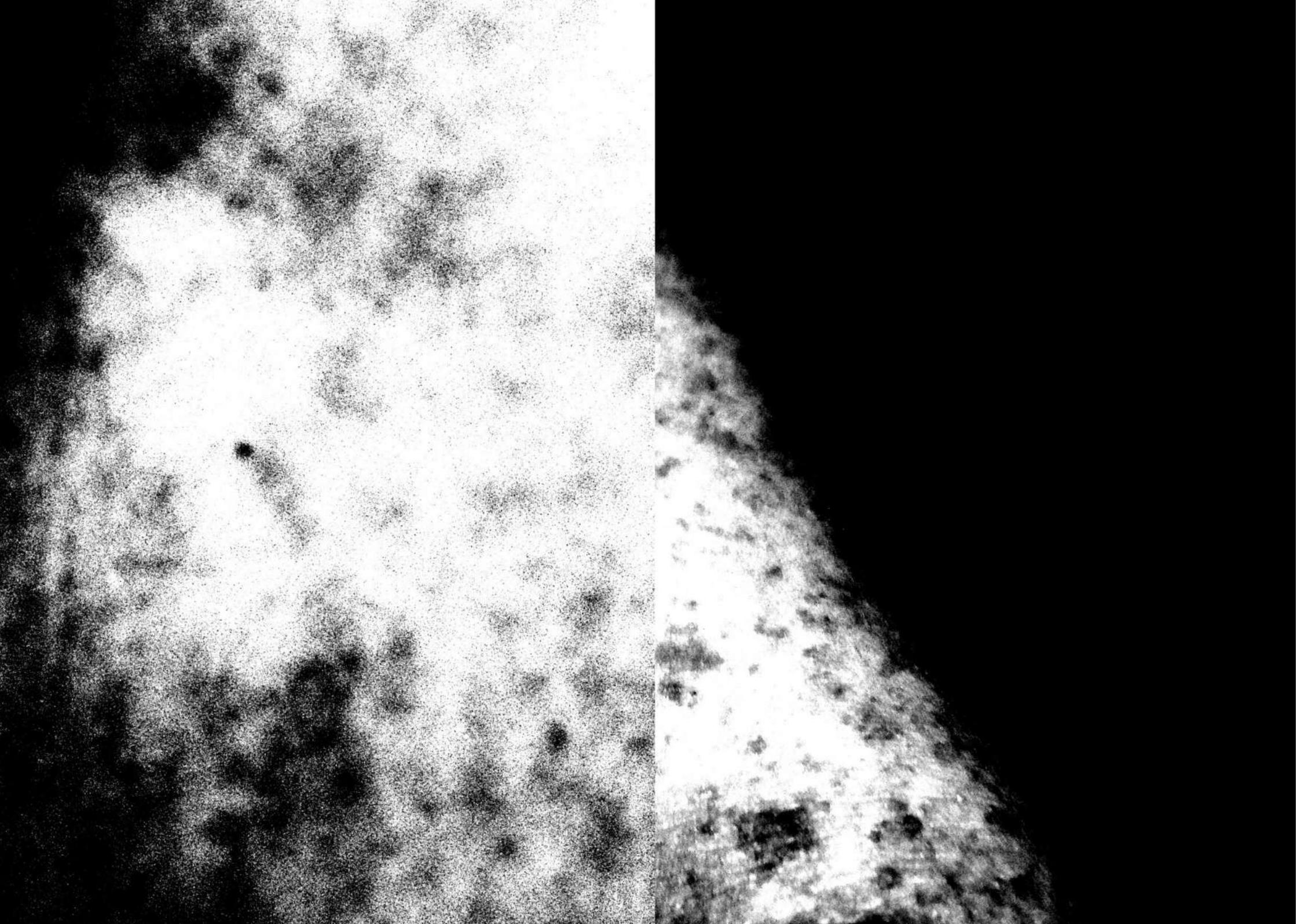
"Find out if there are correspondences as affects in phenomenological imperceptible ranges or complete the perceptible affect with the imperceptible. Or understand the affect incorporating dimensions of the same affect, letting matter speak. (Research Diary, 25/08/2016)"
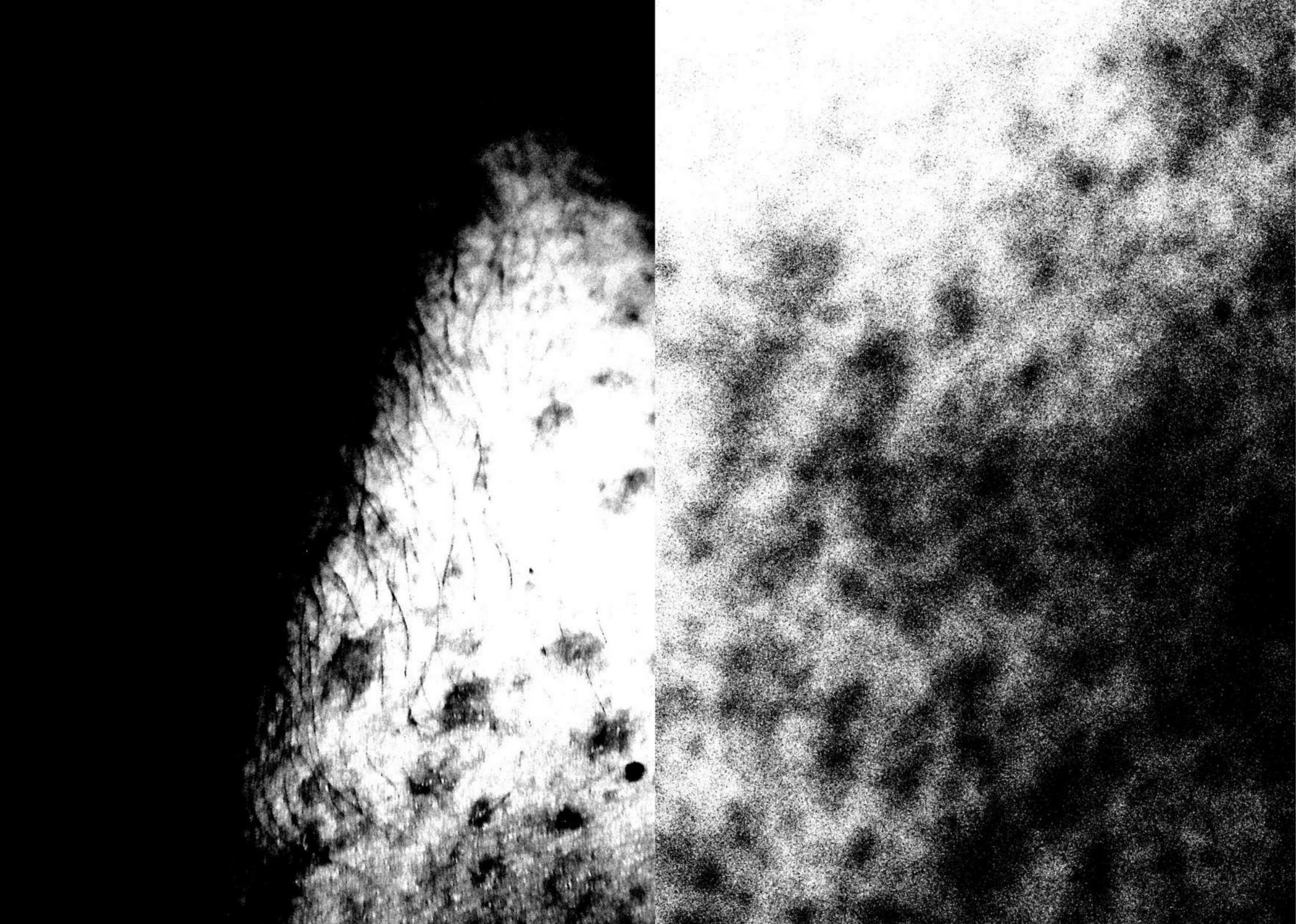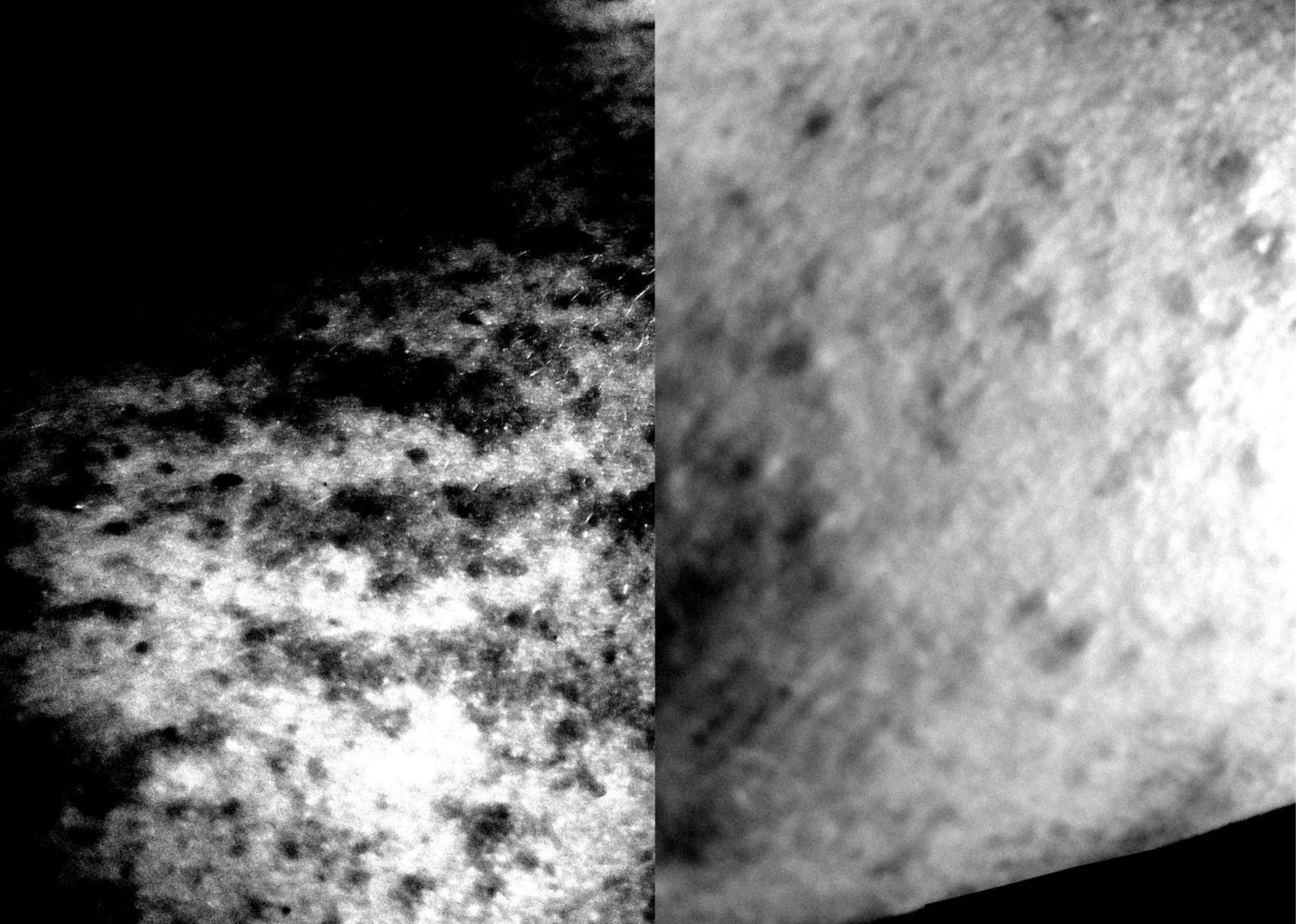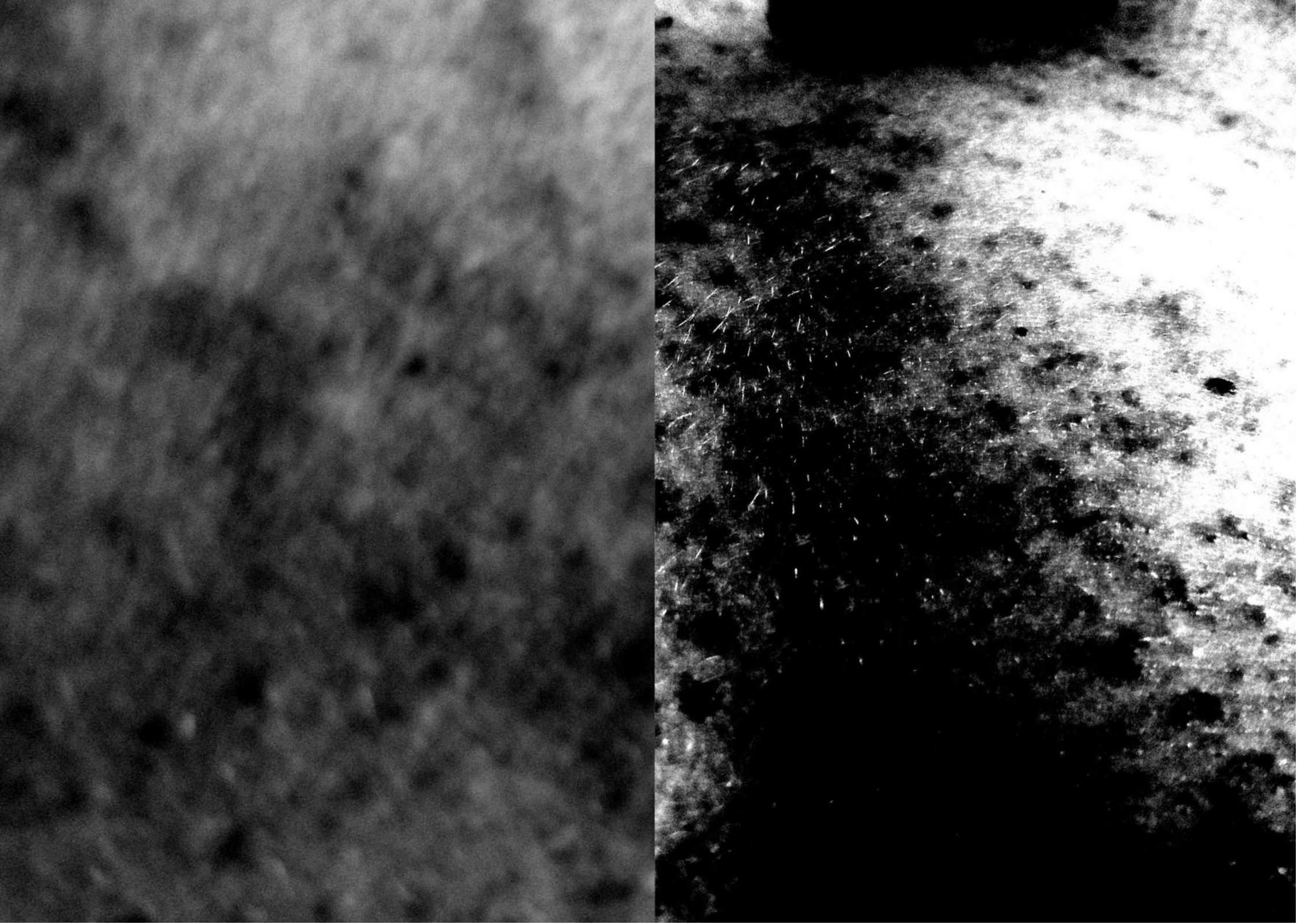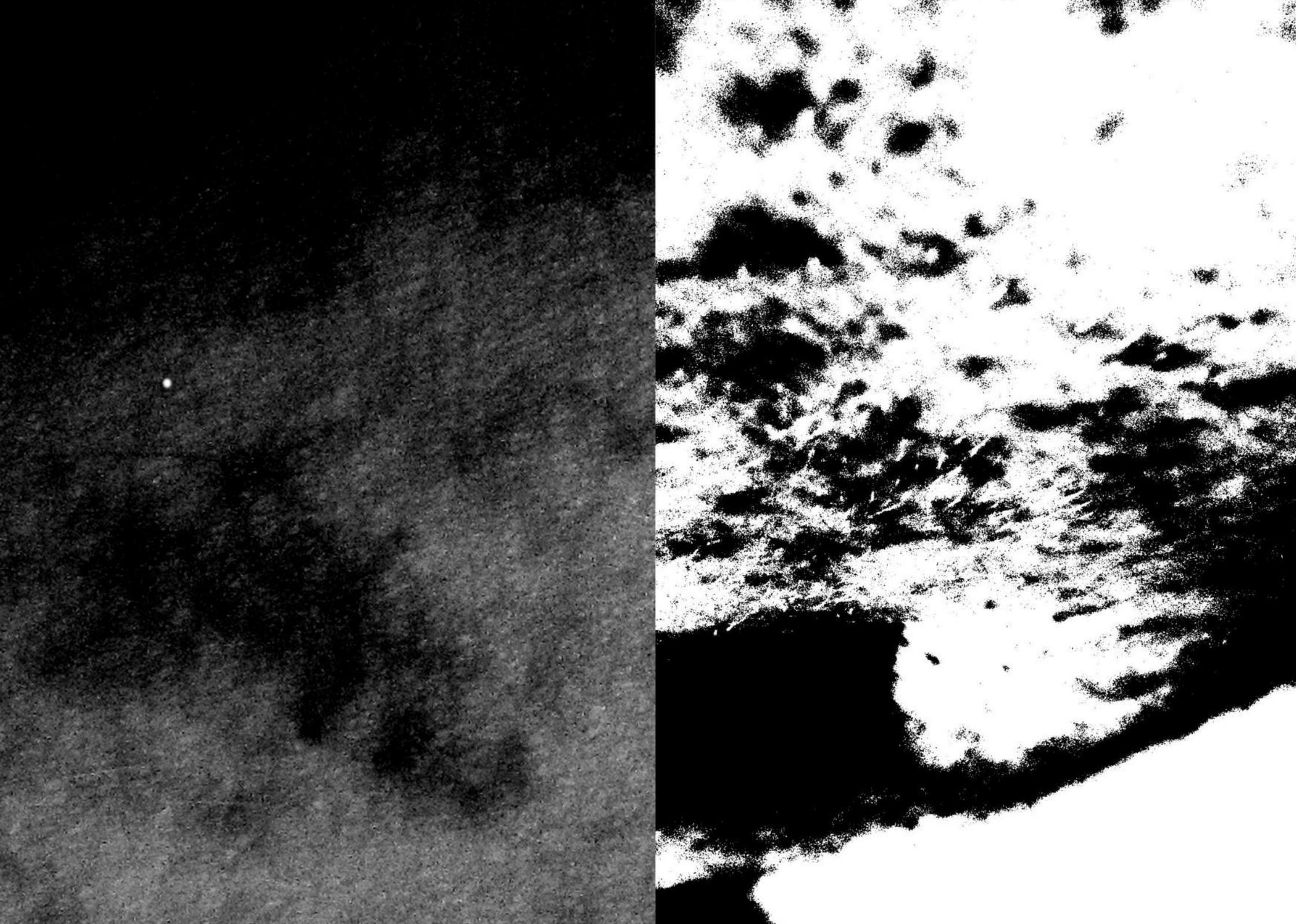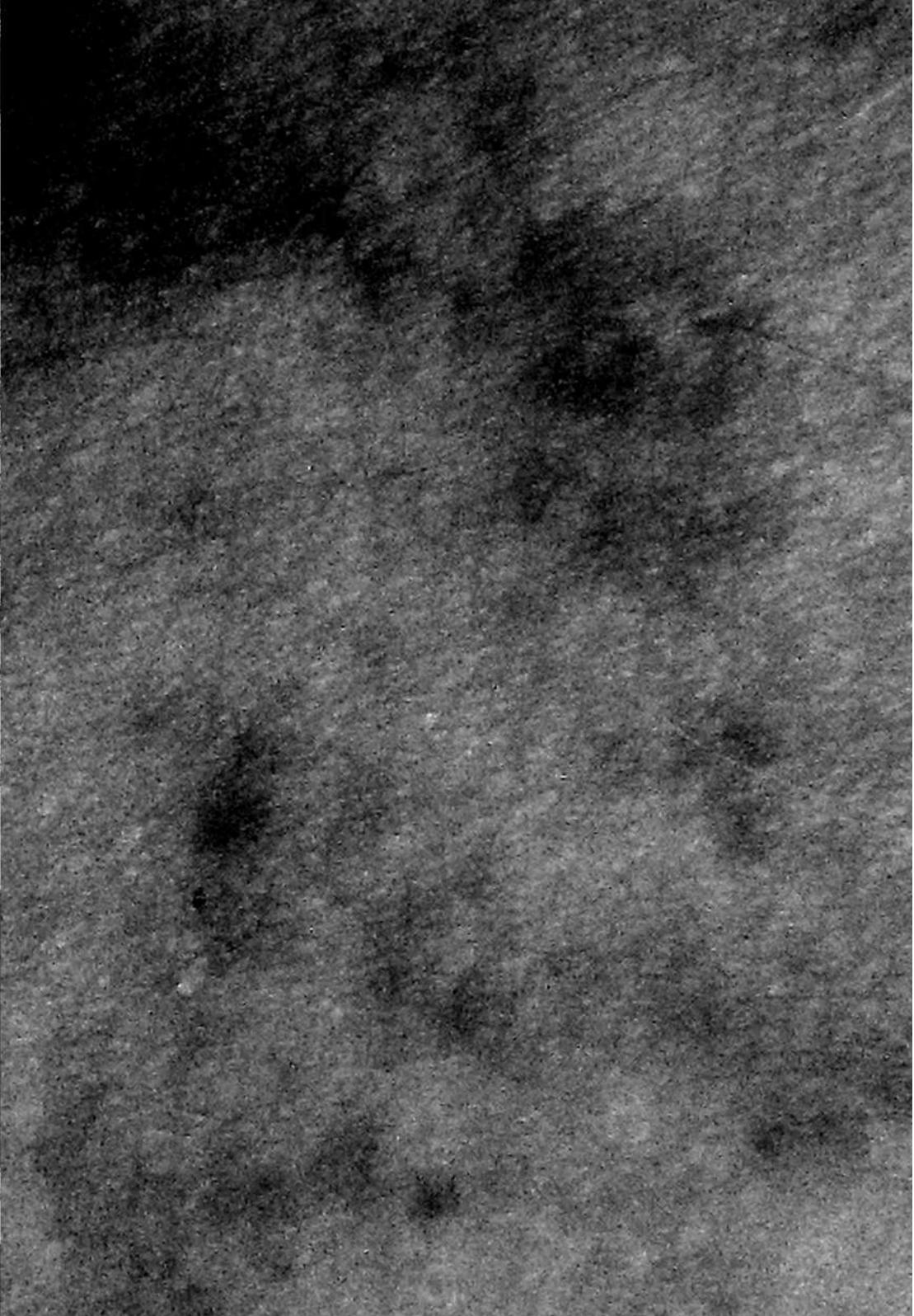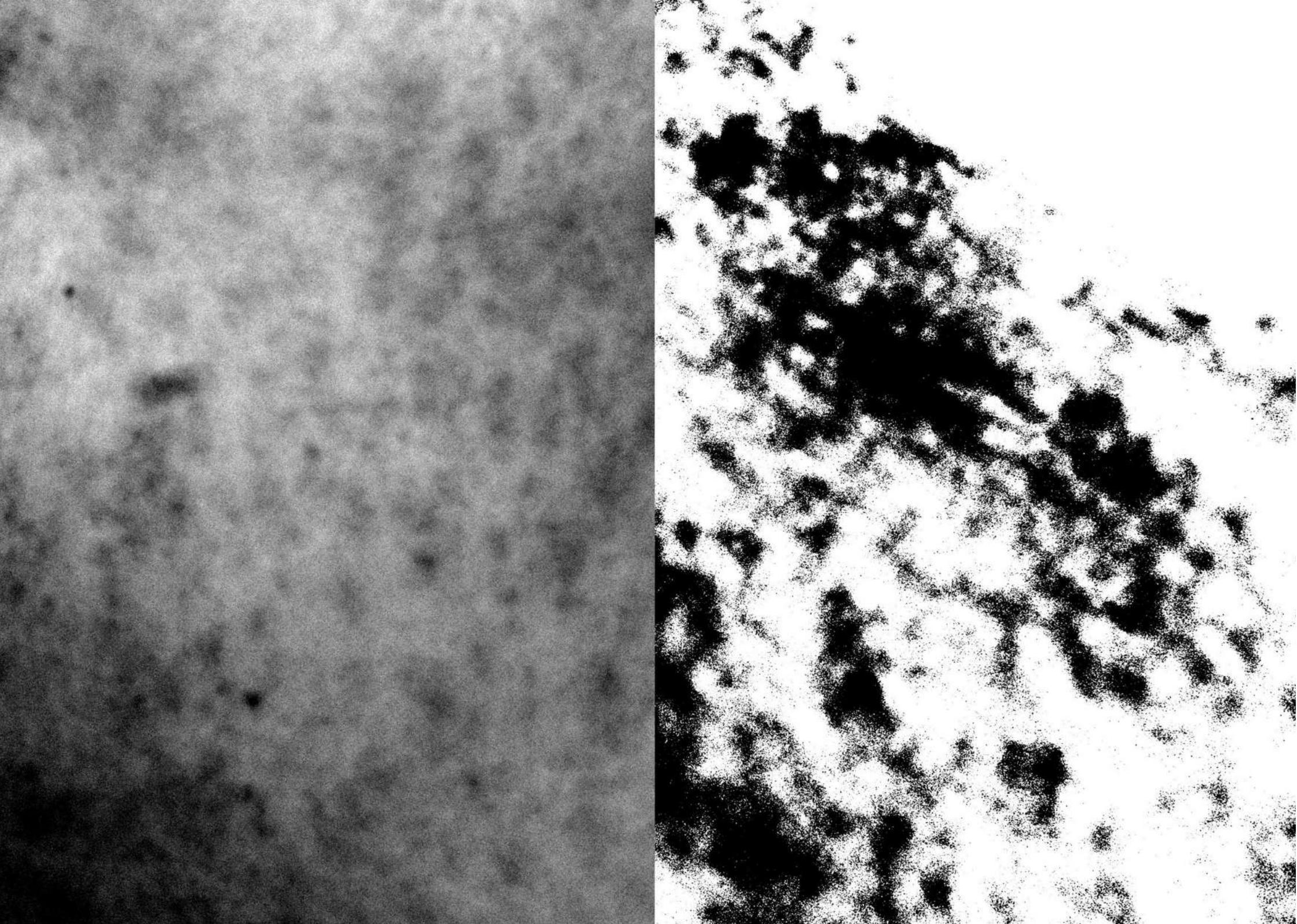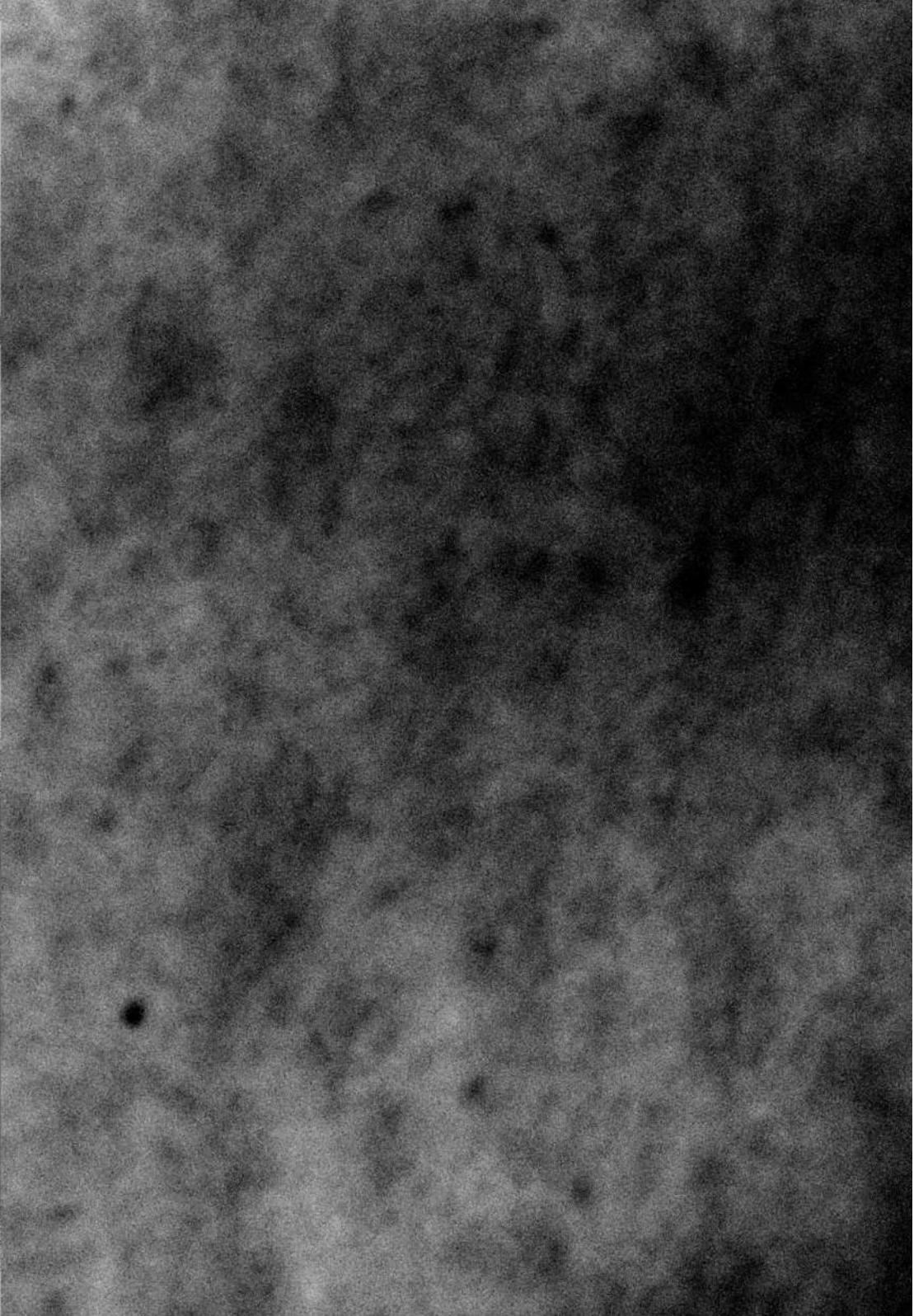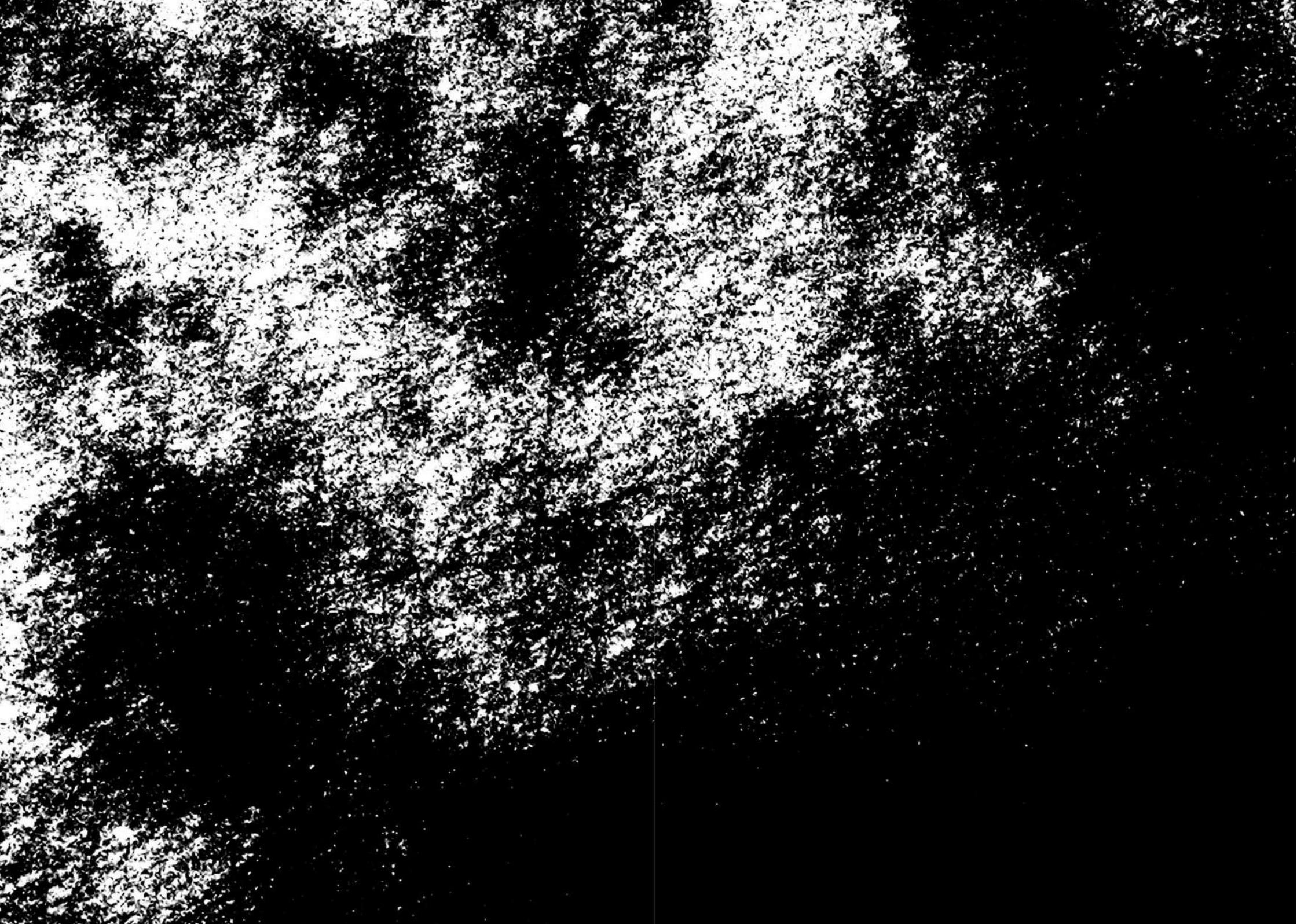
3.8   Knowing beyond truth, a radical contingency approach.

In the same sense Latour observes a logic in the experiments of Pasteur, he observes two narratives acting in the process of becoming a ferment, where discovery is a process between the two. The conversion from non-entity to ontology, of the fermentation process into a fermenting agent is referred by Latour as a process of coordination between two narrators, one the scientific narrator the other the yeast narrator. The concatenation of these two logics gives rise to the ontology. This process of coordination is similar to what is described by Tim Ingold as the process of a translation key for the linguistics of Ferdinand de Saussure (Ingold 2016).

Tim Ingold offers to analyze the linguistics of Ferdinand de Saussure as another type of co-ordination. For Saussure, the sound of a word does not exist as such but only as images of sounds. The images interface the thoughts, as planes of thought (Ingold 2016, p21). Ingold reminds us that Saussure speaks of language as performing the ability to map one plane into the other (e.g. thought into sound imagery). Saussure speaks of language as a "speech circuit" (de Saussure 2013, xx), with "a minimum of two individuals" (Ibid., p13) and "facts of consciousness" mapping onto representations of "linguistic signs" or "sound patterns" (Ibid.). Saussure repeats the Kantian lack of access, and this allows him to dismiss the physical part of the sound in the circuit. He uses the example of a foreign language that he says, we can hear but it is not possible to enter the "social reality of what is happening, because of our failure to comprehend" (Ibid., p15). Nevertheless, here as well we may come back to a moment in the production of this circuit where there is a type of access in the form of a translation.

For Saussure, there is a process of imprinting where the sounds are mapped onto the concepts. "The individual's receptive and co-ordinating faculties build up a stock of imprints" (Ibid.,

p15). Thus language as a collective form of imprints is constituted by a process of mapping of one amorphous plane of thought and other equally "featureless" planes of sound. Language is seen as a linguistic phenomenon of "adjoining subdivisions" (Ibid., p131). We may argue that the mapping is done from one unknown (sound) onto another unknown (thought) as it developed in the acquisition of the mother language.

Jacques Rancière analyses the phenomenon of language in "The ignorant school teacher" to reinforce his anti-hierarchical views of learning (Ranciere 2013). He utilizes the example of language acquisition in childhood as one instance of learning without a teacher. What he is trying to prove is that traditional pedagogy relies on the figure of an "explaining order" that contains a hierarchical separation between the teacher, who possesses the knowledge and the student, who is dispossessed of this knowledge. However, he claims that mother tongue language is learned by a succession of retention (memory), imitation, repetition, trial and error and method. That child has learned out of her own intelligence (Ibid., p8).

The process of learning the language of our parents, repeats regardless of gender, social condition or race, instantiating the same processes, observing, retaining, repeating and comparing, relating what they wanted to know with what they knew already, doing and reflecting upon what they have done (Ibid., p10). We may as well argue that all of these processes are forms of not-knowing that build up until reaching the point of knowing, that is, until learning the language of our parents. In another book, Rancière analyzes the method initiated by Sigmund Freud to research the unconscious. In *The Aesthetic Unconscious*, he states that such a study can be performed in two ways, described as two modes of operation. One is focused on the traces and the unfolding of these traces to discover the underlying realm, "a process to be reconstituted" (Rancière & Murphy 2002, p64). The other is a direct mark of an "inarticulable truth whose imprint on the surface of the work undoes the logic of a well-arranged story and a rational composition of elements" (Ibid.). The insignificant is then no longer considered an index of what is behind but a direct "mark whose imprint" on the surface undoes the logic "of the well-arranged story". For example, in a dream, we can interpret by following the reading of symbols, but in

a "lapsus linguae" or a slip of the tongue or the hoax, we find the irruption of a force that dis-integrates an order. This is also the case of narrations rendered using permutated texts or the videos making use of the glitch, it consists of forces interrupting an otherwise ordered disposition of elements. This second model is of interest and I will discuss it in more detail in the chapter on analysis.

3.9   The eco-feminist response to the Kantian sublime.

Here is where we need to bring Barad's reading of Bohr into focus, in which she notes that while Bohr does not accept that science can have access to the "thing in themselves" he does not acknowledge the distinction between "noumena and phenomena" (Barad 2007, p30), that is, he does not engage with the dualism of the observer and the observed. In this sense even though he has been considered a neo-Kantian he does not ascribe to the separation that instantiates the Kantian inaccessible. On the contrary, he argues that the way to know things alters the way we know them. For Bohr, there is not such a problem with non-access because things are not separated in the first place.

A model of ontological inseparability is proposed by Karen Barad, in denial of the belief in the "prior existence of separate entities" (Ibid., p128). She suggests thinking of intra-acting matter rather than interacting matter, disputing in this way the inherent individualism of the conceptions relying on separateness (Ibid.). In this sense, she speaks of measuring agencies as intra-acting with the studied matter. Thus phenomena are conceived as the "specific intra-action of an object and the measuring agencies" (Ibid.). In other words, phenomena are the ontological insepara-bility of "intra-acting components" (Ibid., p309).

The conditions described by Karen Barad as ontological inseparability are the schemes that serve to respond to Antarctica outside the sublime. There is a continuity in the matter described as intra-action. As a consequence, the art performed for this investigation in Antarctica and the polar-site can be conceived as paradoxical, since the hash structures of practices understood as

modes of knowing are used for exploring the site. These "measuring agencies" are embedded in the production of the polar-site.

What has been displaced are the hierarchies implied in discovery, there are no separate entities, there is no object-subject differential. Thus, the responses to the research questions are enabled by the hashes of modes of knowing. Paradoxical art performances contain contradictory elements, they enable access to phenomena beyond perception because they are focused on knowing beyond truth.

Donna Haraway suggests considering science fiction and speculative fabulation as an onto-epistemological methodology (Haraway 1997). She accentuates the character of becoming the other, a togetherness, and "ongoingness in the Chthulucene" (Haraway 2016, iii). "Science fiction is a method of tracing, of following a thread in the dark" (Ibid.). In describing her subject she makes the following list, "SF is a sign for science fiction, speculative feminism, science fantasy, speculative fabulation, science fact and also string figures. Playing games of string figures are about giving and receiving patterns, dropping threads and failing but sometimes finding something that works" (Ibid., p10).

3.10   Un sublime asentamiento. 2017.

Documentary fabulation. 23 mins.

This work was originally thought as the visual elements of a live performance for the Transitio Festival in Mexico. It was made using information, footage found on YouTube, pictures and papers referencing the existence of the PM3A, the acronym for a portable atomic unit active in McMurdo station in Antarctica between 1961 to 1969. The video work is made using free software that records the screen of the computer (*recordMyDesktop* 2019). A malfunctioning system incorporated glitches. At the same time, it is using intercalary white and black frames accelerated incrementally until a rapid flicker. The idea of flicker is associated with two phenomena in direct

relation with Antarctica. On one side the blackout, the operations of concealment of classified information of a military character in areas too far to be witnessed. On the other, the white-out, a geophysical phenomenon that overwhelms vision due to a hyper refractive atmosphere. Both, the white and the black render the same effect, blindness, concealment, obstruction of vision. The stereo panning used is meant to reinforce the effect that the two modalities, blackout and white-out produce over perception, that is, disorientation.

3.11 Conclusions

The investigation has been focused in the critique of judgement where aesthetic judgement is described and analysed as the consequence of a division in the hierarchies of knowing that differentiates it from logical propositions. Aesthetic judgement is indirect knowledge, elicited by pain and pleasure. Aesthetic judgement gives human a common sustrate with nature one that is rooted in the human body. The artworks developed in this context respond to Antarctica and polar-site, they demonstrate the methods used to produce knowledge. The methods I have developed range from my own body to other bodies as yeast, yoghurt and text.

Aesthetics is placed against the Anthropocene which, as it has been contested is a contemporary form of the sublime. It represents the impossibility to know what may happen when climate changes and what natural catastrophes of high magnitude these changes might entail. Scientific discovery in climate science may also be seen under the light of the sublime and read as performing a position of mastery in unveiling the unknown. An ordered distribution of events is characteristic of the sublime representation while opposedly the aesthetic regime interrupts the ordered distribution and refocuses on details, descriptions, fluctuations rather than stories. The Anthopocene is a story of apocalypse. In the Anthropocene, the anthropogenic signature triggers a mass extinction and the end of our own species.

Critical views of the Anthropocene, characterize another model, where entities do not have boundaries as they are processes contingently intra-acting. For Donna Haraway, the Anthro-

pocene times "are times of multi-species", of living together with mass extinctions and disasters. A series of responses to Antarctica have been elaborated to answer the question, is it possible to engage with Antarctica beyond the sublime regime of representation? Beyond the Anthropocene? We may consider giving an affirmative answer relying on the system of forces that Rancière invokes as aesthetic responses that he identified as "anti representative art", as art without unrepresentable things.

The impossibility to access, in the Kantian sense of access as direct perception, the event in central Moscow at 23:31 local time on 27 February 2015, was considered similar to the problems placed by the Antarctic site in the sense of being remote (in space-time) and polar, conceived as polluted. In the visit to the site of the assassination of the activist Boris Nemtsov in Bolshoy Moskvoretsky Bridge in Moscow, the problem of access was redefined using a proxy ontology. As using an epistemic togetherness with the yeast culture, the access to the polar pollution is performed by a more-than-human ontology.

I have performed yeast fermentations in Petri dishes on site. In one of the visits to a polluted water pond in London, I contracted a virus infection on the skin. The patterning on the skin served me as a proxy to the site, as an intermediary that is at the same time the site. The proxy is not only part of the studied locale but part of the production of the site. It is not a case of the witness narrative as in the case of a sensor to the environment but rather, a proxy entangled with the production of the site.

The plate of fermenting yeast was considered as a system of memories made of the bubbles encapsulating the atmosphere of that location. The system of memories and the changes in texture and humidity are interpreted as patterns. Those patterns were translated into sound and this process of alternating yeast and software to sound is seen as sequences of combinations of not-accessing and accessing the polar-site. In itself, the process is a patterning of the type of a hash data structure. A hash of the different species involved in the study of polar-site are modes of accessing the world (knowing). These modes of knowing include carbon dioxide bub-

bles, software routines and sound.

This is also an attempt at interrupting the spectacle, it is not solely the aesthetics of the visual pattern of the changing bio-culture, and it is not only geopolitics and not only science, it is rather all of them at the same time. The Petri dishes with yeast culture is an agential cut and so it is the sound produced by the visual pattern. They are used together in a hash producing a patterning of small variations. The variations and emphasis on the small is intended to refer to a plot of forces, a plot without a story. As Rancière argues, the interrupted spectacle propelled by the aesthetic regime operates absorbing the pathos. In the context of the Anthropocene this absorption of pathos might mean to learn to live with catastrophes, as Donna Haraway claims, emphasizing that we still live ongoing worlds. I have argued in my practice that the absorption of pathos is enacted in dismantling scientific discovery providing access to polar-site by the means of not-knowing.

A form of knowledge "that does not know" is enacted in this practice in forms such as in a yeast culture used as to "sensing" or "measuring" the border between Chile and Peru. Considered a polar-site because the geopolitical border and the pollution of the Atacama desert is considered polar pollution. The polar pollution is accessed in an unconscious form expressing itself aesthetically, through systems of forces and relations performing a patterning. I made images of those patterning.

Access has been conceived as the not-access, as responses, changes, accretions, or on Ranciere's terms, as silent speech. The "little perceptions" at the centre of this investigation are a consequence of the abolition of the hierarchies in the representation of Antarctica. Sonifications are little perceptions and as such, they are used to represent the problem of ontology as presences that move in the work Antarctica 1961-1996. Sound diffusion or spatialization such as panning and quadraphonic sound is seen as "a name of action", to refer to the impossibility to know what something is but to have access to it by its actions. In the work Antarctica 1961-1996, quadraphonic sound was used to represent the invisibilized pollution.

The pollution of radionuclide isotopes in Antarctica, exemplify a contemporary form of the sublime. It is not possible to know how those isotopes got there however we can know that it is a human trace. This form of the sublime operating as an imperceptible phenomena but also as an invisibilized ontology.

Balfron Tower in London served to study Polar pollution in an urban context. The electromagnetic ghost was investigated as the unhearable sound from the architecture and domestic appliances. The sounds detected with an electromagnetic coil were considered measurements of the site and as such, agential cuts. The pollution in urban sites has been found in the periphery of the city. Those sites are extreme and considered polar-sites.

Other experiences led me to think of error as a sensor, just like juxtaposed/diffracted text may be considered erroneous text and a direct, material method. Body fluids were utilized such as saliva and urine, to think of these fluids as intra-acting within materiality as they are proxies to the site.

The experiments with Lactobacillus may be seen as a model to experiment sensing with the female body in Antarctica. Are my body fluids sensitive to the geopolitical borders between Chile and Argentina? The process triggered important insights about the definition of the site as patterning and a production.

The river fence in the city of Punta Arenas was considered as peripheral to the city. This site served as a location to listen to natural radio, using the river infrastructure as part of the circuit of the radio receiver working in the amplitude-modulated frequency range. It served to explore the electromagnetic dimensions of the city enabling the surge of a fictional city, confirming that the site exceeds the location.

Discovery conceals a position of power, of the one with the faculty of revealing the hidden. Art

representing Antarctica coincides with science in the push for discovery, of visualization of otherwise remote and disembodied territory. Both art and science rely on a privileged and staged composition. The fermentation cultures of Louis Pasteur and Antarctica hold in common a similar condition, we know of it by its behaviour, by its actions. The conversion from non-entity to ontology, of the fermentation process into a fermenting agent is referred by Latour as a process of coordination between two narrators, one the scientific narrator the other the yeast narrator. The concatenation of these two logics gives rise to the ontology. As Latour points out, is the concatenation and alternation of narrative planes what constitutes a being. Alternating sequences of accesing and not accessing is what enables access to site.

The knowledge and the knower, a schism that has been reassessed by an "aesthetic plot", made of variation of perceptions, of translations, intensities and speeds. We may as well argue that the aesthetic plot are forms of not knowing that build up until reaching the point of knowing. Otherwise, they are forces interrupting an otherwise ordered disposition of elements. For Bohr, there is not such a problem with accessing or non-accessing because things are not separated in the first place. A model of ontological inseparability is proposed by Karen Barad, in denial of the belief in the "prior existence of separate entities". Ontological inseparability are the schemes that serve to respond to Antarctica outside the sublime. What has been displaced are the hierarchies implied in discovery, there are no separate entities, there is no object-subject differential. Thus, the responses to the research questions are enabled by hashes of agential cuts producing a patterning.

Chapter 4

Analysis

4.1   Introduction

In previous chapters we have explored ideas around the knowledge, the sublime and concepts of the unknown or unpresentable. In this chapter we develop these ideas in relation to ideas from Kant, Rancière, Burroughs and Barad amongst others to identify and clarify a series of methodological approaches that underpin the contribution to knowledge this research makes, namely hacking and producing knowledge through more-than-human-proxies. These are related to specific artists methods using Digital Signaling Processing, material experiments in the field and exploratory writing.

The methodology of hacking is considered onto-epistemological in that the bricolage mode of "making use of whatever is at hand" implies the incorporation of the mode of knowing of each ontology. The methodology involves the construction of hash data structures of modes of knowing. A hash table is a data structure that stores one or more key and value pairs. A hash table can store keys of any type. As it has been described in the research method chapter, the hash structure is built upon relations and may be open to new relations.

These relations, sometimes addressed as aesthetic responses, are discursive practices articulated under a logic of minor perceptions. For example, AM radio being transduced by a germa-

nium diode, using a bridge in the city of Punta Arenas as the ground for a crystal radio receiver, or seawater used as the antenna of a very low-frequency receiver in Bahía Chile, Antarctica. Other responses were; a skin rash of Pityriasis Rosea infection after visiting a sewage water pond in Lordship Recreation Ground in London; becoming mineral in the iridescent film over a sample of urine; arrays of ultraviolet light variations; arrays of wind variations; a picture of my frozen hands after being out in Antarctica; a long shot video where it is possible to distinguish light variations. They constitute discursive practices as a fabulation that uses scientific methods.

Polar-site is a speculative framework to expand the taxonomy of the polar and inaccessible to other borders such as those polluted in the urban environs or the geopolitical borders. This research has contended that the polar-site is configured through discursive practices. These discursive practices are hashes of hacking practices structured in response to Antarctica. As a data structure, the hash used to render polar-site is made of sequences of accessing and not accessing nature. Accessing as in translating a biochemical reaction into ones and zeros and not accessing as in succumbing to infection. All of them respond to Antarctica as the embodiment of the inaccessible.

This chapter of analysis aims to account for the production of the polar-site as discursive practices of processes led by multi-species. A sympoietic perspective is deployed as aesthetic responses that include a variety of sensorial ranges of agency between species. It is developed as a methodology of blurred borders pursuing an understanding of "locally habitable niches through relations" (Latour & Weibel 2016, 205).

4.2   The Kantian translation

In this study, the focus in the Critique of Judgment by Immanuel Kant led me to put the attention in the aesthetic judgment, in the moment of translation of pleasure and displeasure into reflective knowledge. I want to bring our attention to the fact that Kant distinguishes in the sublime feeling a moment where the aesthetic judgment can realize that there is a failure of the senses,

in the experience of the mathematical and the dynamical sublime. This failure implies that there is a moment of contact with the unknown that re-configures perception.

In the case of the sublime feeling described by Kant, it is not only the awe before terror but it is also the realization that there is part of what is there that is not being registered. How is it possible to conceive that failure if there is a gap? Instead of nothingness, what we find is a hole. Instead of nothingness, we have non-thought, as indirect thinking, as osmosis, a contact through material changes of molecules that lead to re-configurations in matter. Kant might have been speaking about a silent speech or a non-human discursive practice engaging human bodies. Perhaps it is the body itself, the first other that non-speaks. The arrangement of practices performing polar-site and Antarctica is structured in hashes of sequences of accessing and not-accessing nature.

4.3   DSP Digital Signal Processing

It appears necessary to reflect on the algorithmic processes known as Digital Signal Processing (DSP) that has been extensively used in the practice of this investigation enabling, for instance, the Analogue to Digital Conversion (ADC) of everyday signals, like luminosity or ultraviolet light accessed with sensor devices, to be processed by the computer.

DSP is the algorithmic technique to process signals of the real world, such as sound waves, seismic waves and light, after they have been converted into a digital signal. This process of digitization that corresponds to the conversion of continuous signals of every day (light, sound, vibrations) into signals that may be used by a computer, involves sampling and quantization, a process of discretization of voltage varying over time that is separated into two stages; the sample and hold and the ADC. In the first moment the digital device, for example "a 12 bit digitizer" (*Quantization* 2019) that samples the signal allowing variations only in periodic intervals, at which it records instant values and ignores if there are changes outside those intervals, in order to provide the ADC with a constant voltage "while the conversion is taking place" (Ibid.). Time

and voltage are converted through sampling from continuous to discrete (Ibid.). While the Digital Signal Processing enables the processing of signals with computers, it also provides the means to handle sensorial information as our body does. Technology such as a sensor is defined as a device with the capacity of detection, that can measure physical properties allowing for them to be recorded, usually sending its data to other electronics, for instance, a computer. As a broad definition, a sensor is understood as a subsystem or an electrical component that has an initial state that is disturbed by the environment. When the disturbance is passed, the sensor comes back to its initial state. We may as well argue that a sensor provides a mode of knowing that is based on its composition as an electronic system. Thus, these disturbances are expressed by the sensor as changes in voltage that are then translated into binary values using the digitization process. Depending on the sampling frequency the amount of information will vary.

For theorists like Adrian Mackenzie, DSP codifies otherwise homogeneous air as he explains it in his analysis of multicore wireless digital signal processing in picoChips (Mackenzie 2009, p1296). He attributes DSP the ability of an enveloping centre that codifies and produces "intensive movement" (Ibid., 1298). In this sense, wireless technologies enabling DSP may be recognized as producing space. The pico chips may be imagined as codifying otherwise open free air, invisibly reconfiguring space.

In the process of electronic sampling, space is codified as well, since the signals are made discrete and non-continuous. There is a moment where the sensor is in contact with the ultraviolet light but they don't share the same nature, one is light, the other an electronic circuit, and a continuous electronic voltage. The continuous voltage of the sensor is in contact with the variations of the environment and this may be recorded in intervals, like a continuous voice modulated by the wind.

We may try to imagine continuous voltage as the skin of a body, a continuous membrane in contact with geophysical variations, they are not of the same nature but at some point there is contact, there is exchange at a particle level. We can imagine that being a moment of not-

knowledge and also a moment of intra-action and ultimately a moment of undetermined aesthetic judgment.

We may as well think of sampling differently. For example, as in the incorporated molecules inside the bubbles of a bar of soap. After pouring water to it, foam is formed composed of myriads of bubbles. Each bubble contains molecules of chemical elements, oxygen, hydrogen. I stroke the bar of soap once more and a new generation of bubbles are formed while others decay. We may think of each of the bubbles as memories as they contain an atmospheric instant. Additionally, we may recall the methodologies developed by glaciological studies that investigate the bubbles of air inside ice cores. They consider that those bubbles found deep inside the ice core, correspond to samples of the atmosphere that is kept frozen in Antarctica and Greenland. These ice microstructures are studied as records of climate which are conceived as 'passive interaction' with the atmosphere that is contained in polar ice sheets (Faria et al. 2014, p2). Deepest findings of the ice core correspond to the atmosphere of one million years ago. These bubbles contain even traces of ashes of volcano eruptions that took place on the other side of the globe. We may as well think of the differences there are between a digital memory and a memory such as a bubble and argue altogether that while the digital memory is composed by sequences of ones and zeroes representing a continuous reality by means of binary representations, the bubble is the register of the moment and by this fact it may be considered as a unitary memory. It is the incorporation of the environment and the creation of a replicate of the conditions of a specific moment through geophysical intra-action. In the case of fermentation, the incorporation of the environment in a bubble is limited in time. But in the case of bubbles trapped in the polar ice sheet in Antarctica, they may remain there for thousands of years, constituting themselves an archive of ancient times.

The bubble conceived as memory is an idea relying on the notion of unitary space of Henri Lefebvre, space is produced in an instant from a point towards all directions. The bubble of yeast conceived as memory is relying on the incorporation of the environment using metabolic transformation, in the fermentation process, for example, the initial state will be the yeast cul-

ture, the first instance of the fermentation process is the pouring of water and sugar on the yeast which starts a reaction that implies the generation of bubbles of carbon dioxide. As a process, it may be seen as an evolving system of memories. The reaction lasts for about one hour and slowly disappears. The original yeast has been changed, this is visible as changes in density, humidity and pattern. The problem is thus the access to these memories. One way to confront it is as the access to changes, and the translation of these changes.

4.4   Discursive apparatuses

The apparatuses devised in this investigation to access the production of the polar-site, combine technical developments with a philosophical framework. It is contested through these series of works that it is possible to access Antarctica using a displacement of the scheme of thought, rather than with any specific technology. Such a scheme breaks through the hierarchies that distribute what is considered knowledge and what is not. The body of work here presented argues that the imperceptible exists because of the orderings of the relations between knowing and not-knowing that regard some things like knowledge and relegates some others to low subjects. This problem engaged by Jacques Rancière as the "pathos of knowledge" has been conceptualized in his critique of the sublime representation as distributions in the fabric of the sensible (Rancière 2004). If examined further, the idea of imperceptible is also vulnerable to being associated with a kind of space, "the space of the imperceptible". Electromagnetic and radiogenic dimensions have been categorized as "Hertzian space" (Dunne 2008) or space of electromagnetic frequencies. In the same sense, the imperceptible may be associated with the space of the law, the space belonging to the treaties governing Antarctica. Furthermore, the idea of the impossibility to access nature that characterizes the sublime representation is a form of "pathos of knowledge" (Rancière 2007).

The initial questions of this research regarding the imperceptible relied on a separation between perceptible and imperceptible that showed their limitations, the unavailability of means, the lack of time, the hyper mediation resulting from the use of sensing technologies to mediate the ac-

cess to the imperceptible. After these constraints, the research proposes a hack based on the critique of the sublime of Jacques Rancière. The hack consists of inquiring about the production of imperceptibility from not-knowledge. We may agree with Kant that there is no access to the thing in itself, understanding that this access is referring to direct perception of phenomena being described with words. Thus, this investigation attempts to approaching the imperceptible as accessible through forms of not-knowing. The imperceptible is made analogue to not knowing, to silent speech and to insignificance.

The investigation about the imperceptible in Antarctica is the investigation about the not-knowing in Antarctica where the ultimate hack is the dismantlement of truth. These ideas are statements about the "distribution of the sensible", or in this case, where are the processes here developed, mixtures of artistic performances and biological ferments, supposed to be located? May we consider that they produce knowledge? The cultures produce variations, the fermentation generates bubbles, we may say memories, the culture produces matter as in carbon dioxide gas. This may be considered as a silent speech of molecules as opposed to spoken speech. The imperceptible may be interpreted as silent speech. We may say that the fermentation produces not-knowledge and that these actions, performed to study the production of imperceptibility, are apparatuses to "dismantle hierarchical orderings implied in representation" (Rancière 2005, p14).

In the article, Writing landscape, on detecting word-virus radiation in Antarctica (*Laboratory Planet* 2016, p20), the word-virus that is made available through cut-ups or diffracted text is shown as one form to not-access. The theory was chosen as part of the methodological approach to responding to the necessity of detecting intensities of words in space. In this article, published in the Laboratory Planet. I exposed the theoretical problem to an argument based on the ideas of William S. Burroughs.

Virus acting between the angles of systems of coordinate points, what Burroughs understands as cut-up writing is time-traveling, a practice that as a result of its performance disentangles concealed messages from across space-time coordinates. Burroughs defined the cycle between

satisfaction and withdrawal of a drug addict as the circuit of junk. "Junk yields a basic formula of evil virus: The algebra of need" (Burroughs 2007, p4). For him, word viruses take part in the circuit of junk either structuring the need or fulfilling it. The word virus radiation that entitles the article refers to setting a comparison with Frederic Jameson's interpretation of ideology (2013). The logic contained in ideology may be compared to a virus formula, a system of coordinate points where the subject takes positions concerning herself, the state, and God. This logic reproduces, enabling the identification of the individual with a larger mass e.g. religion. The virus may be considered a logic (a system of coordinate points) that vehicles the ideology or pleasure.

The sublime representation may be seen as such a logic. The "lack of access to nature" declared by Kant may be understood as a program, and this program corresponds to the ideology of separation. I suggest conceiving the algebra of need described by William Burroughs, as a basal circuit, a line of 5 Volts, as in the electric sensors used in this investigation. The 5 Volts continuous line that is disturbed as the sensor moves and delves in motion. These disturbances are registered as fluctuations in voltage (1 and 0).

4.5   Diffraction

A diffractive reading of the sublime in Antarctica or the imperceptible in Antarctica takes on Jacques Rancière's proposal to analyze the distribution of the sensible in the question of access, of knowledge. If Kant considers knowledge as direct perception, it is questioned if this definition of access is an arbitrary assumption. In the same critique, Kant gives the basis for another type of access, that is aesthetic, the indirect perception of measure. We may as well argue for the similitude between the unknown and the unconscious.

The analysis develops following a diffractive reading of three text sources. The diffracted methodology of writing has been instated for example, by Karen Barad, in her writing about Trinh Minh-ha and Donna Haraway. She begins by redefining diffraction, as an event that occurs and is not singular space-time but rather, "a dynamism that is integral to space-time-mattering" (Barad

2014, p169). She continues by recalling the reading of Haraway of Trinh Minh-ha, she calls it, Haraway's diffractive reading of the account of the difference of Trinh Minh-ha (Ibid.)[1].

The corpus of work developed in this research from a diffraction pattern exploring the imperceptible in Antarctica. The method used, hacking, is considered an onto-epistemological engagement, it produces the polar-site, and at the same time studies the apparatuses devised for the research.

This diffractive text is firstly based on the questions raised by Henry Lefebvre in The Production of Space (Lefebvre 1991), about the nature of space. His writings about rhythmanalysis (Lefebvre 2004) are also considered. Secondly, it takes into account the elaborations of Karen Barad and Donna Haraway about diffraction and the implications that the "diffractive grating" has for a theory of science that combines ontology and epistemology. Lastly, the work of Jacques Rancière, on the distribution of the sensible adds to the diffractive writing engaging with an analysis in the realm of logic. It does so, by evidencing the orderings implied in representation and the hierarchies involved in the sublime. By superposing these sources the research offers a framework to access the imperceptible, where the question of access is dismantled, together with the notion of truth as one of the "epistemic virtues" of science (Daston & Galison 2007). Before introducing the practice conducted within a diffractive elaboration of the production of imperceptibility in Antarctica, a description of the sources will be recalled.

In The Production of Space, Henri Lefebvre (1991) defines "space as a unitary phenomenon" (Lefebvre 1991, p4,20-21,28) produced by object relations. Lefebvre rises a critique on the division of domains and disciplines to study space like this, he claims, is responsible for the social fragmentation and reproduction of the fragmentation. He claims that this separation reproduces a Cartesian separation between space and the subject (Ibid., p4) and is servile to a hegemonic

---

[1]Other authors working in the field of new-materialist theory (For example Sehgal (Sehgal 2014)) utilizing the diffractive method of writing, present it as speculative writing, contributing with interference patterns to re-read the different authors involved. In the case of Sehgal, she composes a diffraction pattern between Karen Barad, Donna Haraway and Alfred North Whitehead (Ibid.). By doing that she acknowledges the consideration of Haraway of diffraction as writing difference (Ibid.).

class (Ibid., p10). Instead, he proposes that space is a production. Space is produced, it is not a container. Space occurs as the objects relate to each other. It is not possible to divide space or add space. According to Lefebvre, space demand for "a unitary theory" that provides a "theoretical unity between the fields of "the physical - nature, the Cosmos; secondly the mental, including logical and formal abstractions" (Ibid., p11).

This model might be understood as well under the framework proposed by Haraway that proposes to look into sympoiesis or a type of relationship between entities with no borders, eliciting a focus on the relations of relations. This collective production of systems that do not have self-defined spatial or temporal boundaries (Haraway 2016, p58) is worthy of attention. To differentiate autopoietic systems from sympoietic systems the previous consist of units that self preserve, tend to homeostasis and are predictable. The later "always partnered" doesn't have beginning or end units thus information and control "are distributed among components".

4.6   Discursive practice

I would like to bring back the focus on DSP, Digital Signal Processing and on the image of a continuous voltage and a window frame where data of variations registered in the continuous voltage is stored at intervals. Signals are sampled, digitized, transformed, into ones and zeroes. The zero, however, doesn't mean absence, instead what it means is, 'not being one' (and not being 5 volts).

The experiments and explorations in subpolar and polar-site perform sequences of accessing and not accessing nature. As it was described in the chapter of research methods, each combination of agencies displays a sequence of accessing and not accessing as described in the table 2.3.2 Research in practice. Accessing as in perceiving directly, luminosity, the sound of the wind, reading a graph of ultraviolet light variations and not accessing as in pain, vertigo, infection and fermentation.

The glitch performs a different relation. It is a manifestation of the meeting of different natures, the human and the machine. The glitch is similar to an accident, a slip of tongue a "lapsus linguae", or the hoax. The work *A sublime settlement* demonstrates the above.

As well as the texts A common element and Writing Landscape on detecting Virus radiation in Antarctica (*Laboratory Planet* 2016) that can be found at the end of this thesis, incorporates the hoax and that these hoaxes are made by algorithms, they are seen as forces interrupting ordered disposition of elements.

Figure 4.1: Still from *Un Sulime Asentamiento* (2018)

Figure 4.2: Still from *Un Sublime Asentamiento* (2018)

These differences of scale are addressed as scalar distinctions by Karen Barad, where she says that,

> The diffraction [indeterminacy] of time at the core of quantum field theory, troubles the scalar distinction between the world of subatomic particles and that of colonialism, war, nuclear physics research and environmental destruction; all of which entangle the effects of nuclear warfare throughout the present time, troubling the binaries between micro and macro, nature and culture, nonhuman and human (Barad 2017, p56).

She indicates the necessity to trouble time and to re-consider our temporal conventions to recognize the agency of previous times as being active in present time when facing a surge of fascism and a renovated nuclear race. In this sense the time-travel experiments such as the walk with a yeast fermentation to the bridge in Moscow where the activist was killed or the texts rendered by permutation describing another Antarctica, are examples of time traveling. I argue that these experiences face the necessity to challenge the notion that only one moment exists at a time (Ibid., p57).

The bubble in the ice core is a good example of sequences of not accessing and accessing. There is the mineral bubble contained in an ice layer, the bubbles integrate traces of elements of the atmosphere, and we can know of that evidence by means of glaciological techniques such as the counting of insoluble particles, mass spectrography (Ruth et al. 2008, p5675), molecular diffusion of stable water isotopes amongst others[2] (Holme et al. 2017).

Vertigo is on the other spectrum. The exercises of rolling down the hill were thought to counterpart the influence that the activity of measuring frequencies with a sensor unit had on my perception of the site. The way to know site was through setting the body and the skin in contact with the land. Rolling down the hill was meant to dismantle the coordinates of reflective knowledge and increase disorientation.

---

[2]For example, methods for water-insoluble particle counting (Coulter counter and laser-sensing particle detector), soluble ion analysis (ion chromatography and continuous flow analysis), elemental analysis (inductively coupled plasma mass spectroscopy), and water-insoluble elemental analysis (proton induced X-ray emission)

The focus this research is set on is the discursive practices of yeast, virus, vertigo, pain, infection as proxies to access the polar-site and Antarctica. These discursive practices might be thought of as non-discursive since they are not language as such. However, it is possible to distinguish the agency, for example, functionality, the functionality that microorganisms perform might be thought of as discourse. Antarctic science is aware of this: one case is the study of the metabolic functions on Archaea ancient bacteria that are studied as proxies to understand the ancient configuration of climate thousands of years ago. The focus on Archaea inhabiting permanently frozen lakes or anoxic environments in Antarctica (Karr et al. 2006) is known by the activity of these communities and the traces of them in these polarised environments (e.g. the anoxic pond), the fluctuation of prokaryotic cells in correspondence with variations in the climate works as a simile model to perform artistic research through proxies where discursive practices such as writing or embroidering by a human are similar to the release of methane by an Archaea bacteria.

4.7 Proxies

A proxy is a figure representing something else, such as a natural register that preserves physical or biophysical characteristics of the past such as molecular proxies in palaeoclimatology (Eglinton & Eglinton 2008) or as in the studies of pollen grain size responding to environmental stress. In this sense, the applicability of using fossil pollen grain size as a climate change proxy has been argued (Griener & Warny 2015). Sediment proxies of the increased burial of biogenic material or increased preservation of organic matter are linked to climatic amelioration on the continent (Presti et al. 2011). Finally, the fluctuations in prokaryotic cell concentration have been studied as coincident with major climatic states (Santibáñez et al. 2018). All of these methods in Antarctic scientific practice have been implemented in order to study events in the distant past. I will argue that these are similar to what has been implemented in this artistic research.

A hash of practices perform polar-site, these hash structures serve as measuring agencies that

produce phenomena in intra-active relations between the measuring agency and the subject of study. These hash structures are used as proxies to access Antarctica, they are entangled in the production of polar-site and perform aesthetic responses produced in this research. The responses are not used as witnesses of a distant past but as an instance in the production of polar-site.

I will explain why I think the different hash of practices are combinations of accessing and not accessing the problem of study in the context of the hacking practices. While hacking is happening and the technical affordances are enacted, the subject-object moves. In the intensified present that David Chandler relates to hacking, the polar-site is produced and missed out. Its access is intermittent, it is felt as an irruption, the bursting of a different state, as in the hoax of "A journey that happened" by Pierre Huyghe described in the contextual review. In Greenwich Island (2009), I used a hydrophone, a VLF receiver, video and the body as a sensor. The hydrophone and VLF receiver transduce a signal from one realm to the other by means of electromagnetic frequencies. All digital means require DSP Digital Signal Processing, a translation of voltages to numerical values. Both, electromagnetic transduction and DSP may be considered discursive practices (Research Diary, August, 2019).

4.8 Proxy as non-site

The model of the ice core to study the climate of thousands of years ago is comparable to the concept of non-site. The traces of climate (such as isotopes) are contained in bubbles of air in the ice, the ice accumulates layer after layer of falling snow. Those bubbles are indexes of site. The bubble is a non-site. The non-site in this sense is defined as a container of indexes. The ice core is a hash table of climate indexes.

4.9 Conclusion

The contribution to knowledge this research makes is through the relocation of technological and scientific methods within a field of critical and poetic practice to deploy an understanding of how Antarctica can both be represented and engaged with through artistic practice. This work extends existing approaches to the artistic representation of Antarctica identified in the contextual review as they propose alternative ways of representing it through the development of the concepts and methods described above.

Inverted lists or hashed organisations are core to the methodology - ethnographic lists markup the salience of particular notions within groups which can then be divided into sub-lists; my practice methodology can be seen as akin to playing with the inversion of the ethnographic method to produce new sites that interrogate a different Antarctica. Thus, hacking articulates sites of resistance to traditional notions of value, advancing an autonomy resilient to control by otherwise external forces.

In particular, I have devised a 'hacking' methodology enabling aesthetic access to Antarctica through the use of measuring agencies and "agential cuts". Through the combination of three vectors of analysis: geopolitics, science and environment the different hashes of practices have produced the polar-site.

I have employed techniques borrowed from science but relocated them within a field of artistic practice as polar-site's 'proxies'. These were used to mediate the relation with Antarctica and extreme locations through their not-accessing or not- knowing. This is considered a multispecies epistemology where modes of knowing and of not-knowing enable access to the imperceptible.

I have combined this approach with the use of technological objects including sensors, text and biological cultures, and tested these approaches in the field in both Antarctica and other extreme environments. This work is evidenced in the documentation and discussion of artwork in chapter 2 and 3. This work in itself is offered as a methodological contribution that gathers

together diverse methodological and theoretical threads through tangible and accessible forms that evidence the efficacy of the approaches discussed.

The superposition of beings and forms of knowing, produce a pattern, a hash of accessing and not accessing instances of knowing and not-knowing. Throughout the different approaches, I have argued that the way of knowing site alters its production as re-configuring what is known and that the practice of hacking enables the introduction of diffraction as a way to produce a pattern. These patterns produce the site, different proxies arranged as a hash list combine their modes of knowing or agential cuts, rendering discursive practices, within these different arrangements of knowing and not-knowing, for example, digital signal processing, fermenting and getting a skin rash. Polar-site is produced within these hash.

The polar-site is a methodology of performing hashes of hacking practices. Sometimes they are hashes of proxies, measuring site through their epistemology. For example, my skin as a proxy to the Lordship Recreation Ground manifested its access to the site through an infection, a rash, and "Pytiriasis rosea". These "measuring agencies" or agential cuts are entangled with the polar-site's production. These practices become diffraction gratings with their structures. The hacking practices are hashes of epistemologies, produced by the superposition of modes of knowing through the intra-action of human and more-than-human.

The conditions described by Karen Barad as ontological inseparability are the schemes that serve to respond to Antarctica outside the sublime. Thus, the methodology to produce polar-site renders representations of Antarctica that absorbs the dichotomy of access and non-access unveiling the simulacrum of the sublime and imperceptible to present it as one of the possible representations. The end of this dualism between access and non-access enables the possibility to render multiple representations outside the sublime plot, or inside the sublime and at the same time outside of it, working with the ambivalence and the simultaneity manifested as the irruption of a force that disintegrates an order.

A full-range of methodologies were tested rendering a different Antarctica via time-travelling or superposing space-time coordinates. A method of "radical contingency" as claimed by Yusoff might mean the combination of ontology and phenomenology and also the consideration of the inextricable union between knowing and being. Mute ontologies were used as proxies, their changes were seen as mute writing, and as such, as discursive practice and a hash, a patterning, considering the potential of signification in their bodies as "everything speaks".

Site and non-site (defined in Smithson's terms) mean the Petri dish is the non-site as the gallery is non-site, both represent abstractions from site; but diffraction means they are extruding and overflowing with new sites at the same time until frozen in a moment of observational deliberation (delirium) - these (ontological) oscillations tie in with the descriptions of the practice and Barad's agential cut then equates to the 'site' designated for study made by a particular hash list.

4.9.1 Analysis of the practice

Project	Description	Discursive practice	Hash
Sound Cartography			
Puerto Williams (2015)	Sensor Unit, Garbage as archive	Observing, Measuring, Sensing, Speculating	0 1 0
Pali Aike (2015-2016)	Sensor Unit, Body as sensor, pH, Video, Soil Pattern	Sensing, Measuring, Observing	0 1 0 0 1 0 1 0
Cerro Sombrero (2015)	Rolling down the slope, Inversions, Black and white photography, Sensor Unit	Sensing, Pain, Vertigo, Measuring	0 0 0 0 1 0 1
Volcan Puyehue (2016)	Body as sensor, VLF, Yeast as sensor	Measuring, Listening, Fermenting, Fasting	0 0 1 0
San Juan (2017)	Black and white photography	Observing, Measuring	0 1
Punta Arenas (2017-2018)	Light leakage, radio Galena, black and white photography	Listening, Preemption,Leaking, Measuring	0 0 1
Ushuaia (2017)	Sensor unit, black and white photography, light leakage	Measuring, Observing, Leaking	0 1 0 0
Polar pollution			
Chacalluta, Crossing a border with a yeast culture (2016)	Yeast on Petri dish	Fermenting, Border-crossing	0 1
Lordship Recreation Ground (2016)	Yeast as sensor, Infrared photography, Pytiriasis Rosea, Sensor Unit	Measuring, Observing, Infection	0 0 0 0 1 0 0 1
River Moskva (2016)	Yeast as sensor, Image to raw data, Raw data to sound	Time-travelling, Translating Observing	0 0 1 1 0
Non-site			
Yeast (2016)	Yeast, Theremin sensor, Performer	Fermenting, Digital Signal Processing, Speculating	0 1 0
Lactobacillus vaginalis as an aesthetic response (2017)	Lactobacillus vaginalis on agarplate	Fermenting, Observing	0 0
Antarctica 1961-1996 (2017)	Hand made embroidery, Conductive thread, Theremin sensor, four channel sound spatialization	Digital Signal Processing, Listening, Quadraphonic sound, Embroider	0 0 1 0
A sublime settlement (2017)	Found youtube footage, websites, Video glitch, permuted text	Glitch, Found-footage, documenting	0 0 1
Beer Moulds as an aesthetic response (2017)	Mould as sensor	Growth, Observing, Measuring	0 0 1

Kant, Rancière, Burroughs and Barad have been used in a hash. The patterning produced by diffractions of these texts, bring up an interpretative framework to understand the sublime as the ideology of separation. These texts provide a diffraction grid composed by the production of space, the ontological inseparability, a displacement of the scheme of thought and the algebra of need.

The failure of the senses described by Kant in the sublime feeling implies that there is a moment of contact with the unknown that re-configures perception. This moment of contact speaks of a common substrate. The common substrate I am referring to is similar to the algebra of need identified by William Burroughs. That common substrate might be a process rather than an ontology, withdrawal and satisfaction? pleasure and displeasure? Kant might have been speaking about a silent speech or a non-human discourse engaging with human bodies. Perhaps it is the body itself, the first other that "non-speaks". I notice a similarity to the process by which a sensor interfaces sensorial reality with computer hardware.

The arrangement of practices performing polar-site and Antarctica are structured in hashes of sequences of accessing and not-accessing nature. The moment of translation of pleasure and displeasure into reflective knowledge is described by Kant in the Critique of Judgement. What he describes is similar to digital signal processing (DSP).

It is a translation located inside computer hardware. It translates nature's sensorial realm into ones and zeroes. I argue that this might be seen as a discursive practice. The experiments and explorations in subpolar and polar-site perform sequences of accessing and not accessing nature which can be seen as DSP, as sequences of ones and zeroes.

4.9.2   Contribution to knowledge

Hacking is considered an onto-epistemological methodology, it implies the modulation of knowing by being. A proxy is used instead of a witness. The proxy is produced by "the thing in itself" providing indexes to time and locations (space-time coordinates). Hacking produces a pattern-

ing of more-than-human-proxies such as in the generation of bubbles of carbon dioxide. As a process, it may be seen as an evolving system of memories.

The initial questions of this research regarding the imperceptible in Antarctica relied on a separation between perceptible and imperceptible that showed limitations. The hack consists of inquiring about the production of imperceptibility from the perspective of not-knowledge. We may agree with Kant that there is no access to the thing in itself, understanding that this access is referring to direct perception of phenomena being described with words. Thus, this investigation attempts to approaching the imperceptible as accessible through forms of not-knowing. The imperceptible is made analogue to not knowing, to silent speech and insignificance. The investigation about the imperceptible in Antarctica is the investigation about the not-knowing in Antarctica where the ultimate hack is the dismantlement of truth.

When using proxies it is stressed that there is no difference between the thing and the thing in itself, or in other words, noumena are entangled with phenomena. Thus, time-travelling is a practice that as a result of its performance disentangles concealed messages from across space-time coordinates.

Diffractive reading of three sources: Barad, diffraction, a dynamism that is integral to space-time mattering. Henry Lefebvre's production of space, space as a unitary phenomenon produced by object relations. Donna Haraway, that proposes to look into sympoiesis or a type of relationship between entities with no borders, eliciting a focus on the relations of relations.

The glitch performs a different relation. It is a manifestation of the meeting of different natures, the human and the machine. The glitch is similar to an accident, a slip of tongue, a "lapsus linguae", or the hoax. Is an irruption of the ordered distribution of events manifested as differences of scale or scalar differences. Barad proposes to troubling the binaries between micro and macro, nature and culture, nonhuman and human through these encounters.

The bubble in the ice core is a good example of sequences of not-accessing and accessing. There is the mineral bubble contained in an ice layer, the bubbles integrate traces of elements of the atmosphere, and we can know of that evidence using glaciological techniques. During a million years, the bubble has silently accumulated traces of the atmosphere. The bubble is non-thought, however, it is possible to know of those traces by using glaciological techniques of analysis. The sequence of accessing and not-accessing it is established as a long period of accretion of non-thought that can be translated into thought by technology and science.

In the practice of this investigation I have developed hacking agencies that performed discursive practices, transduction, observation, measuring, sensing, speculation, pain, vertigo, listening, fermenting, fasting, preemption, infection, digital signal processing, quadraphonic sound, photography, embroidering, glitch, found footage, growth, patterning. These discursive apparatuses provide access to the production of polar-site, combining technical developments with a philosophical framework. The patterning or hash shows instances of not-knowledge, of intra-action and ultimately instances of undetermined aesthetic judgement.

The answers to the research questions have been enabled by the hash of agential cuts that produce a pattern. We could think of the functionality that microorganisms play as discourse, as an apparatus, as a pattern. In the functionality of Archaea, ancient bacteria, for example, it is possible to distinguish the agency of methanogenesis as the functionality of methane generation.

Therefore, polar-site production is understood as a pattern of processes and functionalities of multiple species. Functionality has been used in Antarctic science as the proxy to understand ancient times. This research argues that this functionality could be considered a "more-than-human" discursive practice and that they serve to study the production of the polar-site.

Looking at the table, 4.9.1 analysis of the practice, in the columns discursive practice and hash, the functionalities deployed during the research are listed. Future investigation will have to en-

gage with describing this functionality interpreted as discursive practices and expand the notion of proxy to pin down the singularities of such processes. Particularly interesting are the processes of transduction and fermentation. In this sense it should be noted that further investigation should include in the theoretical framework the work of Gilbert Simondon, in particular his writings on transduction. This can be thought of as complementary to this current theoretical framework that is seen as providing the basis to understand the work with proxies as a contribution to represent Antarctica outside the witness narrative of the sublime.

Hacking Antarctica

Alejandra Pérez Núñez

16-28 January 2019

Private view: Wed 16 January, 5–8pm

Artist talk: Mon 21 January 5–6pm

Hacking Antarctica explores artistic responses that interrogate the chasm now apparent between humans and nature and proposes a methodology for artistic research based on hacking.

The exhibition showcases artworks that challenge representations of the polar continent, and embracing the concept of site as a concept that reinforces the productive character of art as it devises locales and leaves visible the infrastructure that is part of its production.

Experimental devices – ranging from bio-cultures to digital sensors – were implemented across sites in sub-polar areas, high altitudes, and extreme environments including highly polluted areas. Used as unconventional registers they were designed to implement forms of human and non-human discourse as a means to investigate the production of imperceptibility in the Antarctic region.

Based on a conception of hacking as an onto-epistemological method –in the sense that ways of knowing are altered by ways of being – the hacks presented in the exhibition involve some of these field works and site-specific performances.

The work presented aims to contribute to the displacement of dominant forms of human 'truth' in which the imperceptibility of the non-human is remaindered as inaccessible and insignificant. Instead recognition of the hegemony of the 'distribution of the sensible' is foregrounded such that imperceptibility may be newly regarded as the production of an alterity of not-knowledge.

Cretaceous sandstone from the Magallanes basin more than 140 million years old. San Juan, Punta Arenas.
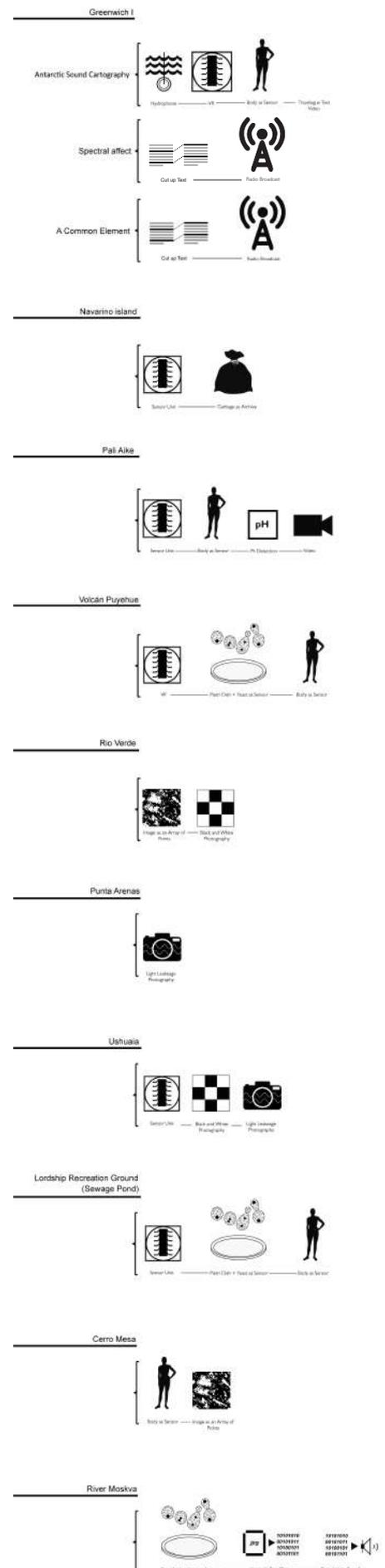
WRITING LANDSCAPE
ON DETECTING BACKGROUND *WORD VIRUS* RADIATION IN ANTARCTICA[(1)]

BY ALEJANDRA PÉREZ NÚÑEZ **artist**
http://elpueblodechina.org

In 2009 I began an investigation into the Antarctic territories. I was recording unperceivable sounds through the use of transducers. While I was staying at Base Prat in Greenwich Island I thought of the accumulated discourses, of the intensities related to scientific investigations and geopolitical treaties mapped over a place with such unusual configurations as Antarctica.

A concept of a system of coordinates can be read in *The Ticket That Exploded*, a work by William S. Burroughs (1967) with contributions from Brion Gysin, Michael Portman and Ian Somerville. The book was developed mainly out of the permutations and juxtapositions executed over a pool of written material (2).

Nova criminals are described in *The Ticket That Exploded* as non tridimensional organisms active as systems of coordinates that unfold throughout the "addicts of the world" and other confluences. (3)

The basic Nova technique is very simple: ALways create as many insoluble conflicts as possible and always aggravate existing conflict – This is done by dumping in the same planet life forms with incompatible conditions of existence. W.S.Burroughs (1962) *The Ticket That Exploded, p.55*

I propose that there are forms in the text, such as systems of coordinates emergent in the cut-ups, juxtaposed and permutated text, that evidence re-duced subject-object distinctions. These systems of coordinates are networks that contain angles, and degrees of deviation or separation, so that, from degree 0 in perception, meaning the total fascination and loss of boundaries, to those angles within the systems of coordinates that spread over into the "tissues of predilection." (4)

0 degrees of total immersion is the instantaneous multidimensional. Word pushes us away from degree 0. That degree 0 is the fully libidinal place of fulfilment.

Burroughs asserts that the same infectious organism, the "word virus", is a key to having access to Operation Rewrite (5), since, because everything is pre-written (6) and pre-recorded, (7) it is possible to access the pre-recordings.

I now will introduce the concept of the "instanta-neous multidimensional", in relation to the exploration of systems of coordinates in the juxtaposed text, as this serves as an interface with which to explore landscape, since it is executed to become an index of site. The exploration takes place through a completion of degrees.

Degrees of separation between the subject and the object, the writer and the writing, landscape and the self, the self and "The Other Half".

Burroughs, in *The Ticket that Exploded*, asks, "You know about the logos group?? and describes them as discharging "engram tapes" for domination (8)

Alien secret groups and bureaus clear and discharge strains of viral infectious words, with sequences to control human affect. (9)

The process of "word virus" infestation can be compared to a process of indoctrination such as the promotion of an ideology.

Fredric Jameson (1981) points out that Althusser's concept of ideology is "a representational structure which allows the individual subject to conceive or imagine his or her lived relationship to transpersonal realities such as the social structure or "the collective logic of history". (10)

The infestation of the "word virus" described by Burroughs may be seen as a simile for the operations of scripture performed in late antiquity in relation to the Old and New Testament that Fredric Jameson uses as a proof of a large project of indoctrination, in the medieval and patristic system known as the four levels of scripture, which was used, "as a strategy for assimilating the Old Testament to the New (...)" (11)

These operations of rewriting the Life of Christ as a re-writing of the Old Testament seem, according to Jameson, to have been based on a system of categories. Thus writing and re-writing might be seen as a technology applied to scripture.

"*It is precisely by way of the moral and anagogical interpretation (the collective "meaning" of history) that the textual apparatus is transformed into a libidinal apparatus*". (12)

Once libidinal, contagion is widely spread as the need is established - A kind of "full spectrum dominance" (13) operates instantaneously from inner speech to the Nova Police, with the police working through your inner speech. Burroughs relates domination to lines of pleasure and the "algebra of need", a series of cycles

related to scarcity, satisfaction, fear, withdrawal and waiting. (14)

Burroughs describes virus domination spreading through vibrating photos, flicker ghost, spliced recordings, engram tapes, juxtapositions, the other half, permutations, pattern pulsing, remote mineral silence, writing machines. The sequences of relations, established by the method of the four senses, convert the particular into the universal, daily life into human universal history. It is an algorithm, it is software performed over words that have since then been repeated over the centuries. Those words, the scriptures, transported a logic, a virus, as Burroughs named it, an infectious logic of ideology. They are streams of words that, for Burroughs, correspond to a form of alien invasion, or a "biological mutation". The nature of these alien invaders is polymorphous, sometimes "alien", sometimes undercover police agents, an "inflexible machine", a mixture of radioactive vapor bureau officers. (15)

Nagasaki - Injury Headquarters - Dual mammalian structure - Hiroshima People - Or some disgusting officers produced the rest of it. (Burroughs, W.S. (1964) Nova Express. p.37)

The idea I propose is that text can be used to interface landscape, placing text against landscape or over it , becoming a mold of the real, being itself an index, a system of coordinates that parallels the multidimensionality of each site. Text molds the "instantaneous multidimensional" , redacting it into a mold of a face, the traces left in topographies, traces of history, and in the particular case of Antarctica, and many other remote unaccessible places, traces of empire.

I will take my work, A common element (2013) (15) as an example of such performative text and propose it as a mimetic interface to the instantaneously multitudinal in the Antarctic landscape.

From time to time the murmur continued. The sound also took the form of a continuous screeching or jingling comprised of many overlapping high-frequency whistles. The Very Low Frequency emissions involved in this universal interweaving. With the exception of sounds produced normally by natural noises, they are called Very Low Frequency emissions or VLF ionospheric noise. (...)

Sources of Very Low Frequency emissions

Nature and influence of VLF emissions using unusual society-community teams. The evidence is strong that VLFenomenology emissions in electro magnetic space are complex political geo messages remaining with no explanation. Various theories have brought up the presence of charged particles in the outer ionosphere.

Guided missiles, flee with amphibious submarines. North American Rockwell World War and the discovery of the magnetosphere was present during testing and in the way the sky lit up at night. (...) Report in itself : the Garrett Corporation has designed the motors - They bounce between the earth and the ionosphere and occasionally they take a ride in military planes; General electric has its own think transcender in order to reach the earth again in the opposite hemisphere. Hewlett-Packard company "radar control" Jet propulsion laboratory; Littletown Industries build arching over the equator, whistlers and globetrotting signals, signals of assault ships and orientation and fire control systems, from the initial explosion of a bolt of lightning they unfold, forming a glissando.

(...) Quasi-musical sounds with audible frequencies like a faint jumble to World War, North American Rockwell at 1500 cycles per second. It is the property of being directionally dependent or toisotropy of millions of U.S. dollars. It has been observed in the high performance intercosmos satellites called TEMP running guided missiles and advanced amphibious submarines.

(1) - This text has been written as a snapshot of a larger essay. It is using concepts found in the books, Naked Lunch (1959), The Ticket That Exploded (1962), Nova Express (1964) and The Third Mind (1978) by William S. Burroughs.
(2) - The Third Mind (1978) p.10-11 The ticket that exploded (1962) p.65
(3) - op. cit. p.57
(4) - The Ticket That Exploded (1962) p.58-59
(5) - op.cit p.49
(6) - Odier, Daniel. The Job: Interviews with William S. Burroughs. New York: Penguin, 1989. p.28
(7) - Everything is done with tape recorders" The Ticket That Exploded (1962) p.166
(8) - The Ticket That Exploded (1962) p.20
(9) - As described in detail in Nova Express (1964) and The Ticket That Exploded (1962)
(10) - Jameson, F (1981) "The Political Unconscious: Narrative as a Socially Symbolic Act. p.30
(11) - Fredric Jameson, The Political Unconscious (1981).p.29
(12) - Fredric Jameson, The Political Unconscious (1981).p.30
(13) - A concept coined by the Pentagon (2000) and brought into academic discourse by Steve Goodman in Sonic Warfare (2010)
(14) - "Junk yields a basic formula of evil virus: The algebra of need". The Naked Lunch (2004) p.4
(15) - According to Burroughs the origin and history of this word virus was formulated by Steinplatz "the word was a virus of what he calls BIOLOGIC MUTATION effecting the biologic change in its host which was then genetically conveyed."Electronic Revolution (1970) p.6. A further argumentation should consider the relation with Valis (1981) from Philip K Dick. Alien agents in Nova Express (1964) p.33. An inflexible machine in The Naked Lunch (2004) p.112
(16) - A common element (2014) is a radio work whose text has been executed through the application of Burroughs' writing techniques using as sources two articles by Douglas Kahn, Earth Sound Earth Signal. Energies and Earth Magnitude in the Arts and The Military-Arts Nexus: Two cases in the United States, c. 1970. and Helliwell text on Whistlers and Related Ionospheric Phenomena. http://radio.museoreinasofia.es/alejandraperez

Bibliography

Anthropocene Feminism │ April 10-12, 2014 (2019). [Online; accessed 23. Aug. 2019].
   URL: *http://c21uwm.com/anthropocene*

Bal, H. E. & Grune, D. (1994), *Programming language essentials*, Addison-Wesley.

Barad, K. (2007), *Meeting the universe halfway: Quantum physics and the entanglement of
   matter and meaning*, duke university Press.

Barad, K. (2014), 'Diffracting diffraction: Cutting together-apart', *Parallax* **20**(3), 168–187.

Barad, K. (2017), 'Troubling time/s and ecologies of nothingness: Re-turning, re-membering,
   and facing the incalculable', *New Formations* **92**(92), 56–86.

Bataille, G., Lebel, R., White, I., Waldberg, I. & Brotchie, A. (1995), 'Encyclopaedia acephalica
   comprising the critical dictionary & related texts'.

Battersby, C. (2007), *The sublime, terror and human difference*, Routledge.

BBC News (2015), 'Putin critic Boris Nemtsov shot dead', *BBC News* .
   URL: *https://www.bbc.com/news/world-europe-31669061*

Biemann, U. (2006), *Maghreb connection*, Actar.

Bloom, L. & Glasberg, E. (2011), 'Disappearing Ice and Missing Data: Visual Culture of the Polar
   Regions and Global Warming', *Far Fields: Digital Culture, Climate Change and the Poles, ed.
   Andrea Polli and Jane Marshing. Wilmington. NC: Intellect Books* .

Burke, E. (1982), *Reflections on the Revolution in France (Penguin Classics)*, Penguin Classics.

Burroughs, W. S. (2007), *Naked Lunch: The Restored Text*, Grove/Atlantic, Inc.

Chandler, D. (2018), *Ontopolitics in the Anthropocene: an introduction to mapping, sensing and hacking*, Routledge.

Cherry-Garrard, A. (1922), *The Worst Journey in the World,(in 2 Vols.)*, Constable.

Chi, L. & Zhu, X. (2017), 'Hashing techniques: A survey and taxonomy', *ACM Computing Surveys (CSUR)* **50**(1), 11.

Claeys, G. (2007), *French Revolution Debate in Britain: The Origins of Modern Politics*, Palgrave.

Collins, N. (2006), *Handmade electronic music: the art of hardware hacking*, Taylor & Francis.

Cosgrove, D. E. & Della Dora, V. (2008), *High places: cultural geographies of mountains and ice*, IB Tauris.

Crutzen, P. J. & Stoermer, E. F. (2000), 'The "anthropocene." global change newsletter 41, 17–18', *International Geosphere–Biosphere Programme (IGBP)* .

Danowski, D. & de Castro, E. B. V. (2016), *The Ends of the World*, Polity.

Daston, L. & Galison, P. (2007), 'Objectivity'.

de Saussure, F. (2013), *Course in General Linguistics (Bloomsbury Revelations)*, Bloomsbury Academic.

Denzin, N. (1994), 'Lincoln.(1994). handbook of qualitative research', *Thousand Oaks, CA, US: Sage Publications Inc* .

Derrida, J. (1987), 'The truth in painting. 1978', *Trans. Geoff Bennington and Ian McLeod. Chicago: U of Chicago P* .

Dodds, K. (2002), *Pink ice: Britain and the South Atlantic empire*, Vol. 6, IB Tauris.

Dodds, K. J. (2006), 'Post-colonial antarctica: an emerging engagement', *Polar Record* **42**(1), 59–70.

Doherty, C. (2009), *Documents of contemporary art: Situation*, MIT Press.

Duncum, P. (2005), 'Visual culture and an aesthetics of embodiment', *International Journal of Education through Art* **1**(1), 9–20.

Dunne, A. (2008), 'Hertzian tales: Electronic products, aesthetic experience, and critical design'.

Eglinton, T. I. & Eglinton, G. (2008), 'Molecular proxies for paleoclimatology', *Earth and Planetary Science Letters* **275**(1-2), 1–16.

Electromagnetic Propaganda, 2010 - Bureau d'Etudes (2015). [Online; accessed 19. Apr. 2019]. **URL:** *https://bureaudetudes.org/2015/04/20/electromagnetic-propaganda-2010*

Fazi, M. B. & Fuller, M. (2016), 'Computational aesthetics', *A Companion to Digital Art* pp. 281–296.

Fox, W. (2011), *Terra Antarctica: looking into the emptiest continent*, Trinity University Press.

Freud, S., Bonaparte, M. E., Freud, A. E., Kris, E. E., Mosbacher, E. T. & Strachey, J. T. (1954), 'Project for a scientific psychology.'.

Fuller, M., Malina, R. F. & Cubitt, S. (2008), *Software studies: A lexicon*, Mit Press.

Gharde, N. D., Thounaojam, D. M., Soni, B. & Biswas, S. K. (2018), 'Robust perceptual image hashing using fuzzy color histogram', *Multimedia Tools and Applications* **77**(23), 30815–30840.

Glasberg, E. (2011), '" Living Ice": Rediscovery of the Poles in an Era of Climate Crisis', *WSQ: Women's Studies Quarterly* **39**(3), 221–246.

Glasberg, E. (2012), *Antarctica as Cultural Critique: The Gendered Politics of Scientific Exploration and Climate Change*, Palgrave Macmillan.

Gregory, D. (2004), *The Colonial Present: Afghanistan, Palestine, Iraq*, Blackwell Pub. Malden, MA.

Griener, K. W. & Warny, S. (2015), 'Nothofagus pollen grain size as a proxy for long-term climate change: An applied study on eocene, oligocene, and miocene sediments from antarctica', *Review of palaeobotany and palynology* **221**, 138–143.

Gross, S. W. (2002), 'The neglected programme of aesthetics', *The British Journal of Aesthetics* **42**(4), 403–414.

Guattari, F. (2005), *The three ecologies*, Bloomsbury Publishing.

Guha, A., Saha, K., De, B. K., Subrahmanyam, K. V. & Shreedevi, P. (2017), 'Space weather effects on lower ionosphere: First investigation from bharati station during 34th indian scientific expedition to antarctica', *Advances in Space Research* **59**(8), 2007–2018.

Guin, U. (1984), *The Compass Rose*, Panther.
URL: *https://books.google.co.uk/books?id=pHP1AQAACAAJ*

Hall, K. Q. (1997), 'Sensus communis and violence: A feminist reading of kant's critique of judgment'.

Haraway, D. (2015), 'Anthropocene, capitalocene, plantationocene, chthulucene: Making kin', *Environmental Humanities* **6**(1), 159–165.

Haraway, D. J. (1997), *Modest- Witness@ Second- Millennium. FemaleMan- Meets- Onco-Mouse: Feminism and Technoscience*, Psychology Press.

Haraway, D. J. (2016), *Staying with the trouble: Making kin in the Chthulucene*, Duke University Press.

Haraway, D. J. & Goodeve, T. (2018), *Modest_Witness@ Second_Millennium. Female-Man_Meets_OncoMouse: feminism and technoscience*, routledge.

Holme, C., Gkinis, V. & Vinther, B. (2017), Molecular diffusion of stable water isotopes in polar firn as a proxy for past temperatures, *in* 'EGU General Assembly Conference Abstracts', Vol. 19, p. 5431.

Inc, E. F. f. N. S. (1978), *Bulletin of the Atomic Scientists*, Educational Foundation for Nuclear Science, Inc. Google-Books-ID: wwoAAAAMBAJ.

Ingold, T. (2000), *The perception of the environment: essays on livelihood, dwelling and skill*, Psychology Press.

Ingold, T. (2016), *Lines: a brief history*, Routledge.

Ivanov, L. & Ivanova, N. (2014), *Antarctic: Nature, History, Utilization, Geographic Names and Bulgarian Participation (in Bulgarian)*.

Jia, G., Triulzi, C., Marzano, F. N., Belli, M. & Vaghi, M. (2000), 'The fate of plutonium, 241 am, 90 sr and 137 cs in the antarctic ecosystem', *Antarctic Science* **12**(02), 141–148.

Jie, Z. (2013), 'A novel block-dct and pca based image perceptual hashing algorithm', *arXiv preprint arXiv:1306.4079* .

Kant, I. & Walker, N. (2008), *Critique of judgement*, Oxford world's classics, Oxford University Press, Oxford ; New York.

Karr, E. A., Ng, J. M., Belchik, S. M., Sattley, W. M., Madigan, M. T. & Achenbach, L. A. (2006), 'Biodiversity of methanogenic and other archaea in the permanently frozen lake fryxell, antarctica', *Appl. Environ. Microbiol.* **72**(2), 1663–1666.

Kaye, N. & Art, S.-S. (2000), 'Performance, Place and Documentation', *London: Routledge* **30**, 116.

Klinger, C. (1995), 'The concepts of the sublime and the beautiful in kant and lyotard', *Constellations* **2**(2), 207–223.

Krauss, R. (1979), 'Sculpture in the expanded field', *October* **8**, 31–44.

Kwon, M. (2002), 'One place after another', *Site-specific art and locational identity. London* .

Laboratory Planet (2016). [Online; accessed 8. Aug. 2019].

URL: *https://laboratoryplanet.org/wp-content/uploads/2016/04/LABORATORYPLANETn5.pdf*

Latour, B. (1993), 'Pasteur on lactic acid yeast: a partial semiotic analysis', *Configurations* **1**(1), 129–146.

Latour, B. & Weibel, P. (2016), *Reset Modernity!*, MIT Press.

Lazzara, M. A., Weidner, G. A., Keller, L. M., Thom, J. E. & Cassano, J. J. (2012), 'Antarctic automatic weather station program: 30 years of polar observation', *Bulletin of the American Meteorological Society* **93**(10), 1519–1537.

Lefebvre, H. (1991), *The production of space*, Vol. 142, Oxford Blackwell.

Lefebvre, H. (2004), *Rhythmanalysis: Space, time and everyday life*, A&C Black.

Lem, S. (1971), 'Solaris (trans. j. kilmartin and s. cox)'.

Lévi-Strauss, C. (1968), 'The savage mind'.

Lyotard, J.-F. (1991), *The inhuman: Reflections on time*, Stanford University Press.

Lyotard, J.-F. (1994), *Lessons on the Analytic of the Sublime: Kant's Critique of Judgment,[sections] 23-29*, Stanford University Press.

Marsching, J. D. & Polli, A. (2012), *Far Field: Digital Culture, Climate Change, and the Poles*, Intellect Books.

Massey, D. (2013), *Space, place and gender*, John Wiley & Sons.

Massumi, B. (2002), *Parables for the virtual: Movement, affect, sensation*, Duke University Press.

Mawson, D. (1915), *The Home of the Blizzard, Being the Story of the Australasian Antarctic Expedition, 1911-1914, by Sir Douglas Mawson,...[JK Davis, F. Wild, GF Ainsworth, SÉ Jones and AL Mc Lean.].*, W. Heinemann.

May, J. (1990), 'Greenpeace boock of the nuclear age: the hidden history, the human cost.'.

Merchant, C. (2012), *Radical ecology: The search for a livable world*, Routledge.

NASA (2019), 'RADARSAT Overview | National Snow and Ice Data Center'. [Online; accessed 26. Feb. 2019].

URL: *https://nsidc.org/data/radarsat*

Naylor, S., Dean, K. & Siegert, M. (2008), 'The igy and the ice sheet: surveying antarctica', *Journal of Historical Geography* **34**(4), 574–595.

Neumann, L., Sbert, M., Gooch, B., Purgathofer, W. et al. (2005), 'Defining computational aesthetics', *Computational aesthetics in graphics, visualization and imaging* pp. 13–18.

Noble, A., Porter, G. & Wedde, I. (2011), *Anne Noble: ice blink*, Clouds, Auckland, N.Z. OCLC: 776689471.

Nuzzo, A. (2006), 'Kant and herder on baumgarten's aesthetica', *Journal of the History of Philosophy* **44**(4), 577–597.

Oliver, J., Savičić, G. & Vasiliev, D. (2011), 'The critical engineering manifesto', *Critical Engineering* .

Osborne, H. (1970), *The Oxford companion to art*, Oxford University Press, USA.

Pellerin, G. (2017), 'Music and hacking : Instruments, Communities, Values', *Music and Hacking 2017* .

URL: *http://hacking2017.ircam.fr*

Presti, M., Barbara, L., Denis, D., Schmidt, S., De Santis, L. & Crosta, X. (2011), 'Sediment delivery and depositional patterns off adélie land (east antarctica) in relation to late quaternary climatic cycles', *Marine Geology* **284**(1-4), 96–113.

Pyne, S. J. (2016), *The ice: A journey to Antarctica*, University of Washington Press.

Quantization (2019). [Online; accessed 13. Aug. 2019].

URL: *http://www.dspguide.com/ch3/1.htm*

Rancière, J. (2004), 'The politics of aesthetics, ed. and trans', *Gabriel Rockhill, London and New York, Bloomsbury* p. 8.

Rancière, J. (2005), 'From politics to aesthetics?', *Paragraph* **28**(1), 13–25.

Rancière, J. (2009), 'The aesthetic unconscious, trans', *Debra Keates and James Swenson (Malden, MA: Polity, 2009)* .

Ranciere, J. (2013), *El Maestro Ignorante*, Juventud.

Rancière, J. & Murphy, T. (2002), 'The saint and the heiress: A propos of godard's histoire (s) du cinema', *Discourse* **24**(1), 113–119.

Rancière, J. (2007), 'The Future of the Image, translated by Gregory Elliott', *London and New York: Verso* .

recordMyDesktop (2019). [Online; accessed 26. Aug. 2019].
  URL: *http://recordmydesktop.sourceforge.net/about.php*

root (2018), 'the earthcodes project: substrate/shifting the site of execution'. [Online; accessed 23. Aug. 2019].
  URL: *http://www.1010.co.uk/org/earthcode.html*

Root (2019), 'xxxxx_peenemünde publication december 2008'. [Online; accessed 19. Apr. 2019].
  URL: *http://www.1010.co.uk/org/xxxxx_peenemuende.html*

Ross, S. & Richardson, V. (2013), *Ice Lab: New Architecture and Science in Antarctica*, British Council.
  URL: *https://books.google.co.uk/books?id=51aEngEACAAJ*

Ruth, U., Barbante, C., Bigler, M., Delmonte, B., Fischer, H., Gabrielli, P., Gaspari, V., Kaufmann, P., Lambert, F., Maggi, V. et al. (2008), 'Proxies and measurement techniques for mineral dust in antarctic ice cores', *Environmental science & technology* **42**(15), 5675–5681.

Santibáñez, P. A., Maselli, O. J., Greenwood, M. C., Grieman, M. M., Saltzman, E. S., McConnell, J. R. & Priscu, J. C. (2018), 'Prokaryotes in the wais divide ice core reflect source and transport changes between last glacial maximum and the early holocene', *Global change biology* **24**(5), 2182–2197.

Scott, R. F. (2019), 'Turning the pages™ - british library'.

URL: *http://www.bl.uk/turning-the-pages/?id=12878b6a-36b9-44db-a940-365b21bfe524type=book*

Sehgal, M. (2014), 'Diffractive propositions: Reading alfred north whitehead with donna haraway and karen barad', *parallax* **20**(3), 188–201.

Skiena, S. S. (1998), *The algorithm design manual: Text*, Vol. 1, Springer Science & Business Media.

Smithson, R. & Flam, J. D. (1996), *Robert Smithson, the collected writings*, Univ of California Press.

Stengers, I. (2013), 'Introductory notes on an ecology of practices', *Cultural Studies Review* **11**(1), 183–196.

Stephens, R. (2013), *Essential Algorithms: A Practical Approach to Computer Algorithms*, Wiley.

URL: *https://www.xarg.org/ref/a/1118612108/*

Suderburg, E. (2000), *Space, site, intervention: situating installation art*, U of Minnesota Press.

The Center for Land Use Interpretation (2019). [Online; accessed 10. Mar. 2019].

URL: *http://clui.org/newsletter/fall-2002/antarctic-1-exhibit-about-continent-science*

Thompson, J. (2017), Polar Theatre: The Evolution of Acts of Sovereignty in the Norwegian Antarctic, PhD thesis.

Thoreau, H. D. (2006), *Walking*, Cosimo, Inc.

Turpin, E. (2014), *Architecture in the Anthropocene: Encounters among design, deep time, science and philosophy*, Open Humanities Press.

Wark, M. (2004), *A Hacker Manifesto*, Harvard University Press.

Weiss, R. (1984), 'Antarctica and Concepts of Order: Two Installations', *Leonardo* pp. 95–99.

Whatmore, S. (2006), 'Materialist returns: practising cultural geography in and for a more-than-human world', *Cultural geographies* **13**(4), 600–609.

Whitelaw, M. (2013), "Sheer Hardware: Material Computing in the Work of Martin Howse and Ralf Baecker', *Scan: Journal of Media Arts* **10**(2).

Wilkes, O. & Mann, R. (n.d.), 'The story of nukey poo', *B Atomic Scientists; ()* .

Yusoff, K. (2005), 'Visualizing Antarctica as a Place in Time From the Geological Sublime to "Real Time"', *Space and Culture* **8**(4), 381–398.

Yusoff, K. (2007), 'Antarctic exposure: archives of the feeling body', *Cultural geographies* **14**(2), 211–233.

Yusoff, K. (2008*a*), *BiPolar*, The Arts Catalyst.

Yusoff, K. (2008*b*), *Climates of sight: mistaken visibilities, mirages and" seeing beyond" in Antarctica*, IB Tauris.

Yusoff, K. (2009), 'Excess, catastrophe, and climate change', *Environment and Planning D: Society and Space* **27**(6), 1010–1029.

Zalasiewicz*, J., Williams, M., Steffen, W. & Crutzen, P. (2010), 'The new world of the anthropocene'.