

**Goldsmiths, University of London
Politics Department
PhD Thesis**

Divine and Diabolic Radio

Electromagnetic Spectrum, Aesthetics and Latin America

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Declaration of Authorship

I, Paulo José Olivier Moreira Lara hereby declare that this thesis and the work presented in it is entirely my own. Where I have consulted the work of others, this is always clearly stated.

Signed:

Date: 09/03/2020

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Abstract

This work investigates the idea of wireless communication and the construction of the electromagnetic spectrum from a perspective of the Latin American cultural studies and Radio studies. Demonstrating that the wireless forms of expression have had socio-historical particularities and different socio-political manifestations through time, I identify diverse forms, functions and qualities that were given to the spectrum in order to understand what sort of political influence is exerted by the rational organization of radio waves. The hypothesis presented here is that the current control over the wireless infrastructure should be characterised in terms of an aesthetic domination of colonial sort. As the “birth” of the spectrum is found in the “baroque” sciences of the sixteenth century, I also note the radical shift that the notion took with the emergence of industrial capitalism, its technical instrumentality and political economy, arguing that the modern uses and interpretations of wireless media is grounded in colonial conflicts over aesthetic sovereignty and natural resources beyond the disputes over standard regulations, democratic allocation, freedom of expression, access to technology and technical management. Through the study of three experiences of radio in Latin America, I highlight the aspects of interference, illegality, colonial discipline and the control of the territory as manners by which the coloniality of power is expressed within the radio universe. The contribution that this work intends to offer to the areas of media studies, politics and cultural studies is to establish a relationship between the history of the idea (in this case, the construction of order, function and quality) of the electromagnetic spectrum and its impact on the solidification of a domination of modern and colonial kind based on the study of the phenomenon of radio waves and their uses applied for communication and expression in determined Latin American social realities.

Depois do senhor barroco, bem instalado no centro do seu desfrute, a paisagem recupera uma imantação mais poderosa e demoníaca.

José Lezama Lima, *A Expressão Americana*.

Radio presents an inexplicable mystery, an obvious and recurrent miracle. It is no less astonishing than the highest manifestations of magic once were, and it is worshipped as an idol would have been worshipped, with the same simplicity and fear.

Jacques Ellul, *The Technological Society*.

De plata los delgados cuchillos, los finos tenedores; de plata los platos donde un árbol de plata labrada en la concavidad de sus platas recogía el jugo de los asados; de plata los platos fruteros, de tres bandejas redondas, coronadas por una granada de plata; de plata los jarros de vino amartillados por los trabajadores de la plata; de plata los platos pescaderos con su pargo de plata hinchado sobre un entrelazamiento de algas; de plata los saleros, de plata los cascanueces, de plata los cubiletes, de plata las cucharillas con adornos de iniciales... Y todo esto se iba llevando quedamente, acompasadamente, cuidando de que la plata no topara con la plata, hacia las sordas penumbras de cajas de madera, de huacales en espera, de cofres con fuertes cerrojos, bajo la vigilancia del Amo que, de bata, sólo hacía sonar la plata, de cuando en cuando, al orinar magistralmente, con chorro certero, abundoso y percutiente, en una bacinilla de plata, cuyo fondo se ornaba de un malicioso ojo de plata, pronto cegado por una espuma que de tanto reflejar la plata acababa por parecer plateada...

Alejo Carpentier, *Concierto Barroco*.

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List of Abbreviations

ACPO – Acción Cultural Popular (Popular Cultural Action)

EMS – Electromagnetic Spectrum

FM – Frequency Modulated

GHz – Gigahertz

HAM – Home Radio Amateurs

IAU – International Astronomical Union

ITU – International Telecommunications Union

kW – Kilo Watt

MCP – Modernity-Coloniality Program

MHz – Megahertz

NATO – North Atlantic Treaty Organization

UN – United Nations

UNESCO – United Nations Educational, Scientific and Cultural Organization

USAID – United States Agency for International Development

W – Watt

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Introduction

This doctoral thesis aims to investigate the different manifestations of the electromagnetic spectrum, particularly radio waves, related to its social impact in colonial realities. In this way, I assume that there is a centrality in the conceptual aesthetics¹ of electromagnetic waves that can be disputed and that it is over this arena that the legal and cultural domination in the field of wireless communications take place. After identifying the epistemic formation of the electromagnetic spectrum (EMS) and the colonial aspects of such historical and conceptual creation, I conclude that part of the answer to that legal and social challenge around the management of radio waves is a different approach around the idea of what radio is. Thus, I propose that the restriction on the use and the current partial understanding of radio waves, more than a technical, legal and regulatory issue, is a control of the aesthetic expression itself, illustrated here based on social conflicts of colonialism and coloniality.

Overall, contemporary Western society has been driven by the idea that what activates the electromagnetic spectrum is the technology contained in electronic devices and that the politics which governs it is designed by rational use, resource availability and efficient allocation of the electromagnetic space. It is also commonly assumed that the natural properties and qualities of the physical phenomena and the cultural and political history of societies interfere much less in spectrum's matters than the effect produced from its modern technical assemblage as "media". The main target of the critique presented in this work is the viewpoint used to analyse the radio spectrum and its consequential acceptance related to the current status of its use, management and governance. The detachment of the spectrum from its historical manifestations and effects of its expressive fragments refrain us from comprehending the spectrum's composition and the influence that it exerts over meanings, sensations and politics. The main objective is to trace lines over a different epistemology for wireless history and existence from a local perspective, related to resistances against the present narrow definition of the spectrum, its restrictive practical conception and the dominant expressions which such power unveils.

1 I use the term "conceptual aesthetics" inspired by the anthropologist Eduardo Viveiros de Castro, who used the term to characterize a response to the structuralism's binary vocabulary and criticize discontinuities such as between myth and philosophy, magic and science, primitive and civilized. Viveiros de Castro is thinking of recent processes within social sciences that, in the field of language, deny metaphor, representation, semantics, subordination and syntax in order to privilege metonymy, indexicality, literality, pragmatics, coordination and parataxis. Here, the term represents an epistemic battlefield in which the binarism and divisions imposed by the modern-colonial language face practical experiences that create new images for the thoughts and new knowledge productions through the interactions amongst heterogeneous elements. Viveiros de Castro's essay was initially published in Portuguese as 'Filiação Intensiva e Aliança Demoníaca', in *Novos estudos - CEBRAP* [online] 2007, n.77, pp. 91-126. In 2010 a modified version of the text was published in English as 'Intensive Filiation and Demonic Alliance' in Casper Bruun Jensen and Kjetil Rødje (Eds.) *Deleuzian Intersections Science, Technology and Anthropology* (New York: Berghahn Books, 2010), pp. 219 – 250. For my purposes, I will refer to the first edition in Portuguese (unless noted otherwise) and translate it to English when the second version is different from the first. The page number will refer to the pdf file of the original version.

This thesis proposes that the technical instrumental rationality which sees the electromagnetic spectrum as an object separated from its subjective appearances – that is, as only natural, pure, integral, indivisible, translatable object of natural science, or passive and neutral resource that can only be agitated technically in order to gain citizenship – has served to restrain the imagination (and halt investigations) about the epistemic and political qualities that it might present. I argue and demonstrate here how the spectrum and its constitutive fragments are responsible for the construction of different socio-political goals for culture, science and technology depending on how one understands, ordines and interact with them. I observe that the very form, function, properties and qualities of the spectrum render characteristics to the technical and cultural entities according to different understandings about the nature of their social histories, purposes and interactions with social life. Likewise, such social formations also give back a particular meaning to the spectrum and are able to construct a landscape alongside it. Therefore, it is the relation between human action with the material forms, powerful qualities and aesthetic properties of the spectrum which are, for my interest, primary elements of investigation when attempting to understand the economic, political and technical conflicts around wireless media from a peripheral optic.

This work comprises three points of interest acquired throughout the period of research. Firstly, the interest in media and communication from the point of view of the sociology of culture. The question involves the idea that rationality and industrial modernity rendered the means of communication the aspect of an integrated system which moves according to a particular logic. Driven by industrialization and political, cultural and economic interest, the Western modern age disqualifies magic and enchantment through a language of domination and relations of production which ultimately transforms the justification of its technique and scientific rationality into a new sort of myth. Such interest was initially sparked by a discipline on the epistemology of social sciences, conducted by Professor Marcos Nobre, in which we examined the text *Técnica e Ciência Enquanto Ideologia*² by Jurgen Habermas, where, based on Max Weber and Herbert Marcuse, he analyses instrumental rationality and presents his communicative action. There, the notion that epistemological approaches are able to deepen the criticism over the basis of regular and commonly assumed interpretations came to my attention. Moreover, the idea that science and technology acted as “ideology” according to a conduct perpetrated by rational rules seemed intriguing. A few years later, when I was assistant to the discipline “Sociology of Max Weber”, the aspect of domination by

2 Jurgen Habermas, ‘Technology and Science as ‘Ideology’’, in *Towards a Rational Society* (Boston: Beacon Press, 1970).

a “Western rationality”³ became even more interesting as a basis to think media and communications.

Throughout that period, my involvement with media activism⁴ and free radio led me to questioning the parameters in which such movements based its languages and analysis. The increasing participation of artists, intellectuals, collectives and organizations on politics of media by means of festivals, events and digital platforms seemed, at first, to offer a strong practical and an innovative theoretical response to problems related to media monopoly, social activism, the status of art and uses of technology. Nonetheless, I missed the studies on the “notations”⁵ and expressions to contrast the imported vocabulary and grammar of post-structuralist framework. The movement seemed to hold some sort of analogy with Fredric Jameson’s “pastiche”, when he suggests that it “speaks through the mask and with the voices of the styles in the imaginary museum”.⁶ My perception also related to what Richard Hoggart would call an “inorganic use”⁷ of words: the missing vocabulary which not only deny us the possibility of expression but, in fact, halt us from the experience itself. Since the language, gestures, instruments and understandings were based and sustained by predefined cultural norms and specific identitary politics, those same modulations – I felt – were trapping a possible aesthetic experience into an elitist, restricted, white Anglo-Saxan cultural cage. Other factor of contribution to this topic was an artistic vanity as well as an uncritical technological affiliation to “digital culture”.⁸ This artificial language, the institutionalization of this

3 The terms “Western” and “rationality” will be used throughout this thesis. Even though they can refer to more than one signification here and there, they will be generally taken as coupled phenomenon representing stages of a particular condition of a socio-historical universe. Max Weber is here the main reference to present Western rationality as the predominance of thoughts embedded in the belief that “in Western civilization, and in Western civilization only, cultural phenomena have appeared which (as we like to think) lie in a line of development having universal significance and value”. Such development is related to calculability, economy, efficacy and accuracy which leads to the capitalist “spirit”. The “West” is that socio-cultural formation which is believed to carry that universal significance and value, and rationality is the procedure which allowed such belief to be transformed in ethic and conducts.

4 Geert Lovink have a few comments on the partnership made between Brazilian and others activist media groups such as the Waag-Sarai platform, Midia Tática Brasil Festival, Autolabs, Digitofagia, Submídia and Metareciclagem projects. See: Geert Lovink, *Zero Comments: Blogging and Internet Culture* (New York: Routledge, 2008), pp. 152-153; 188-190.

5 E. P. Thompson remind us that a “sui-generis” type of customs connected the conflict between acts and ideas of resistance with macro changes in material and conceptual world. Looking into the *eighteenth* century, he recalls that the grand reforms of Enlightenment and the rise of a very peculiar mode of production and technology were pressuring people ‘to reform popular culture from above’. However, there was also a certain ‘visible’, ‘stubborn’ popular resistance which, instead of being analysed from the patronized way of ‘folklorization’, he argues the importance of the look into an ‘ambiance, mentalité, (...) as a whole vocabulary of discourse, of legitimation and of expectation’, as a ‘notation’ of resistance. See: E. P. Thompson, *Customs in Common* (London: Penguin Books, 1993).

6 Fredric Jameson, ‘Postmodernism and Consumer Society’, in *The Anti-Aesthetic: Essays on Postmodern Culture*, ed. by Hal Foster, (New York: The New York Press, 1983) p115.

7 See: Richard Hoggart, *Schools of English and Contemporary Society: An Inaugural Lecture Delivered In The University Of Birmingham* (Birmingham: University Of Birmingham, 1963).

8 As the uses of Internet increased, not only grass-roots movements started to make use of it for political purposes but “digital culture” also became a cultural public policy in the federal government of Brazil through *Cultura Viva*, Bill

sort of politics and a pretentious posture of techno-aesthetic activism marked a second critical interest in the construction of this work.

The third influential aspect for this work was my interest in Latin America and a curiosity about what its intellectual and cultural history could offer in terms correlating to media, communication and aesthetics from a marginal way of thinking. Departing from baroque influenced expressions in Latin American literature, I intended to observe how that neo-baroque aesthetics could offer element towards new forms of resistance to old forms of epistemic domination. By contrasting the European “sublime” with the Latin American “real marvellous”, I was interested in interpreting the signs of aesthetic and epistemic creations from moments related to its material and cultural history, the encounters with the “other” and its creative fictional production. Besides, the decolonial thought from Latin American scholarly production led me to the investigation within media studies which were based on the centrality of colonial relations and the present form of colonial power.

By engaging in those three frameworks (Critique of Western rationality, media activism and Latin American cultural studies) along with the research covered by the thesis, I intend to demonstrate that, beyond a question of techno-scientific miscomprehension, strict regulation, unfair distribution and biased functions, the present political condition of wireless media is also a consequence of a mode of thought based on epistemic imposition and aesthetic submission rooted in colonial operations. The philosophical and scientific history of electromagnetism show that the components which allow its existence were examined and applied to reveal spiritual, material, aesthetic and social relations in different social conditions. The modern industrial age was responsible for diminishing the importance of such relational and multifaceted aspects along the steps of political, economic and social logic of colonization, rationalization and capitalization of the electromagnetic phenomenon. Since I will argue that the Europe – America encounter is also based in epistemic domination and impositions and the idea of aesthetics is solidified within this universe, I therefore intend to demonstrate the importance and impact of this category in the understanding of (and resistance to) forms of material and symbolic colonial domination in regard to wireless communication. Considering the politics of the electromagnetic spectrum, this thesis elaborates on the aesthetic perspectives of wireless phenomena – particularly of radio waves – seeking to politically connect them to Latin American cultural and social reality. I, therefore, propose a certain political viewpoint which nurtures itself from an aesthetic perception of the electromagnetic spectrum that is able to develop a counter-colonial communication.

13.018/2014. Available at: <<http://www.planalto.gov.br/ccivil_03/ato2011-2014/2014/lei/L13018.htm>>

By examining some landscapes of “spectral” experiences in Latin America I intend to identify how the epistemological perception of electromagnetism can reveal traces which influence the form by which media practice and aesthetic expression are shaped in colonial contexts. Such grid is built around the idea of a decolonial framework for sensuous manifestations, which sees the spectrum as a possibility for the construction of an “art of the counter-conquest”, borrowing the term from José Lezama Lima’s description of the Latin American baroque expression. As a style, artistic practice and conceptual construct, the manifestations of the American neo-baroque appears to provide an illustrative and resourceful basis for understanding the radio spectrum’s decolonial experiences. The tensions of the baroque, presented in the first formulations regarding the EMS, also provide useful indications of Latin American aesthetic particularities for the construction of a perspective for the political understanding of its scientific, historical, technical and spiritual assumptions. When engaged with its magical, atemporal, sensory and demoniac features, this construction informs a way of defying the logic of wireless media and proceed to “dominate the space, torture the forms and mislead the senses”⁹ of its most basic infrastructure. In this sense, this thesis proposes that, concerning the electromagnetic phenomena, the exercise of authority, although justified by technical and legal arguments, is more than a political repression conducted by economic interests: in the case of spectral communication, it is a control and impediment of an aesthetic kind. Not only because it halts the possibility of expression, but mainly because it withdraws an awareness about what the spectrum is and might be, naturalizing it as a monetized intangible form and limiting the possibility of thought from the very conceptual starting point. The legal and formal repression against types of spectral usages enhances a notion of a relationship which diminishes it into an external mediator, tool and carrier – as it impedes an open possibility of aesthetic knowledge and production which interact (ethically rather than technically) in social life.

The European documents which narrate the early history of what we call Latin America – expressing the general Western understanding of the first moments of contact and conquest – were seminal examples related to the construction of modern thinking on perception: a form of aesthetic expression and experience before aesthetics as philosophical concept. Firstly, there is the question of a place imagined before being realized: a *phantasia* prior to an *epistêmê*. In this sense, America appeared as a particular condition of possibility for cognition, opening up new possibilities in virtually every aspect of social, economic, political and cultural life. Such imagination stimulated by the sense of adventure along with a fictional hope for paradise led to an astonished, creative and fearful encounter with reality. Secondly, America offered material and symbolic elements for

9 Artro Uslar Pietri, ‘La tentativa desesperada de Jaymes Joyce’, in *Nuevo Mundo, Mundo Nuevo* ed. by José Ramón Medina (Caracas: Biblioteca Ayacucho, 1998) p.260.

framing the instabilities of the rational mind, since translations and (de)compositions had to rearrange what was odd, old and unfamiliar into an orderly regime of sensory classification. In this sense, the new world solidifies and gives meaning to a hierarchical colonial classification based on relational processes of language and communication. Finally, the encounter with the unknown provokes connections between the expansion of the senses with the material domination of spaces, populations and nature. Besides the experiences of sight, hearing, taste, smell and touch being enjoyed and stimulated for the first time, the concepts for the senses were rapidly mounted, adapted, migrated, re-signified and explored by the colonial and imperialist power.

Few years after the conquest, when Newton coined the term spectrum to refer to the form and movement resulting from material interference in light, the scientific investigations were surrounded by unknown physical behaviour and accepted philosophical arguments, curiosities, assumptions and disputes about electromagnetism's existence as body, substance, movement, particle, wave or media as well as over its influence on perception, senses and beliefs. I trace some of these interpretative constructions to argue that when the EMS was "discovered, created and invented",¹⁰ in the passage from the nineteenth to the twentieth century, there was a significant shift in the way global society organized it conceptually and functionally. This change reproduced a romantic aesthetic mentality and a Western liberal, individual and colonialist view over an "idealized configuration among speakers and audiences".¹¹ When the spectrum becomes an arena for technical, scientific and industrial operations of modernity, it carries with it a renewed form of occupation of spaces by Western civilization. Therefore, I look into the interrelation between electromagnetic space with materiality, culture and nature to exemplify uses and perceptions of the spectrum and its composites in domains that differ from its present convention as a politically neutral natural resource. Electromagnetism's historical and conceptual interactions with extra-corporeal and non-human entities also lead me to consider spirituality as a kind of aesthetic manifestation of wireless media through the spectrum's relations with cosmological imagination, celestial media, universal symmetry and religious artefacts.

I consider the innovative aspect of this work to present, from historical evidences and theoretical references, a critique of the current epistemological perspective of wireless communication and to show its construction as being identified with a regime of colonial power

10 Such terms fit both for describing the process of conquest of America and also as stages for the construction of the idea of the electromagnetic spectrum, as elaborated by Zita Joyce in her PhD Thesis: *Creating order in the ceaseless flow: The discursive constitution of the radio spectrum* (Auckland: University of Auckland, PhD Thesis, 2008)

11 John Durham Peters, *Speaking into the air: A history of the idea of communication* (London: University of Chicago Press, 1999), p. 210.

over a basic infrastructure for communication and expression. Because of the sensory characteristics of the spectrum, I argue that political and economic power over the airwaves is an understated form of aesthetic domination which can be traced back to the apparatus of colonial logic. The suggestion that the spectrum is composed by inter-operative fragments allows us to observe and make sense of its physical, mediatic and material presence depending not only on modern technology but on aesthetic relations, cultural interpretations and political expressions contained in social conditions. Furthermore, its understanding as a composition also permits the spectrum's uncoupling into minor elements, monads, notations, behaviours and gestures as its constitutive fragments, clarifying the relational conditions it depends upon in order to interfere in social reality.

As for the case studies, I explore radio practices to illustrate examples of electromagnetic experiences. Radio waves are one of nature's most elegant sensitive form and make the clearest example of the spectrum's political-economic appropriation. As the most popular way of producing and dealing with radiation, radio waves are both manufactured by technical means and manifested by cultural expressions and communication. As such, radio waves are featured here as fundamentally important spaces of the spectrum's relation to society and to how society creates itself.

It is necessary to state that this work neither denies the existence and reality of the physical phenomenon nor relegates the necessity of studies, researches, policies and actions towards a better allocation of the frequency range and a fair use and organization of the radio spectrum for communication. There is still, even within the current technical and political framework many necessary adjustments in order to make the spectrum available for communication, specially when one thinks in terms of economic monopoly and restriction to access and use by marginalized groups. I also do not deny the fundamental importance of Western thought for the efforts and achievements in terms of structuring technological policies, however, little has been made in terms of thinking alternative modes of thought when it comes to the critique of technical and regulatory aspects of wireless media. The affiliation between modern technology, capitalist economic interests and political forces summarizes the spectrum definition into an accepted intangible topic, away from the common social reality while shaping its very prolongation and perpetuating the domination over and from it.

The first two chapters are a study on ideas of electromagnetic radiation and/or applied to electromagnetic energy before the spectrum was baptised. They both are made of historical fragments which interact and combine to compose a more complex grid of influences and

interferences than the modern electromagnetic solution gives to the explanation of the wireless communication phenomenon. Those fragments are constituted by matter, energy, spirituality, aesthetics and space. The examples from the first chapter are taken from societies from four different places: Meso-America, China, the Andes and Brazil. The second chapter explores the Western philosophical tradition around wireless communication through examination of the ideas of Pneuma, Soul, Aether, Spirit, Light and how did that led to the birth of the concept of the electromagnetic spectrum. In the case of the later, it demonstrates that the spectrum, in its current assumption has a historical construction which marks the hybridity of Western influences that surrounds the phenomenon, even in its most rational aspect.

For I understand that the spectrum can be seen as a complex set of diverse formative influences, these chapters deal with historical, philosophical and political constructions which guided epistemic orders regarding the existence and function of *aethereal* communication. In the end of the second chapter, I identify the birth of the modern spectrum in the science of the seventeenth century, which, despite being influenced by technology, instruments and reason, had also a style for thinking its extravagance and solutions. The reader will be reminded of the relations between this method of interpreting the spectrum and the practical management of it today, so the differences become clear through the argument and the idea that what guides its current managerial order has much of a conceptual creation with historical and social particularities.

Chapter three demonstrates the consolidation of the acceptance of the spectrum as a resource passive to be explored by political and economic interest in the late nineteenth century according to a geopolitical, industrial, aesthetic and technological Western order. It shows how the global order influenced by science and its applications establish the radio waves within rational logic and managerial procedures. The epoch of “discovery, creation and invention” of the spectrum also reveals analogies with the colonial venture and modern exploration as its applications leads to conquests related to the senses and occupation of spaces. The objective is to demonstrate the role of the philosophical historicism and geopolitics as a fundamental contribution for the idea of a natural resource which should be dominated by science and the rational spirit. In this sense, such resource becomes pivotal for economic and political profit through an ordered division, allocation and regulation, and as such, begins to influence the way in which the twentieth century will interpret the radio waves.

Chapters four and five are case studies on two different radios. Firstly I examine *Rádio Muda*, a free radio which broadcast for more than twenty years and suffered legal persecution from telecommunications authorities. I aim to demonstrate that the ideas of illegality, interference and

spectrum scarcity is not only not applicable in the case of the radio but also that this justification for repression onto clandestine broadcasting is an attack on aesthetics, knowledge construction and alternative modes of organization around media. From archive material, personal involvement and judicial documentation, I try to show that the State and commercial interests are bound to a legal perspective which impedes the use of radio waves disregarding the role that the radio plays and its insertions in a determined social context. The following chapter addresses the influence of colonial religious thoughts in the use of radio waves by a Colombian Catholic Radio from 1947. I identify a Western and rational mode of thought which was fundamental for spiritual colonization, the birth of aesthetic domination and the increasing role of Western supremacy in regulating and framing the ways in which communication technologies are used. Thus, I relate the defence of a particular Western cultural policy enforced by post-war geopolitics as a continuation of a colonial paradigm related to the role of the “other” and the control of its expressions, behaviours and attitudes.

Chapter six draws upon the situation of radio in Bolivia and the radio movement created by the mines’ workers from the 1950s. It begins with a description of the social-political situation of dependence on the extractive economy based on the exploitation of natural resources. Following, I present a brief panorama on the situation of the clandestine radios based on secondary sources plus a document made by a Brazilian HAM radio practitioner sent to the International Telecommunications Union (ITU) and describing the situation of Bolivian radio’s in 1968. With that in mind, I move to a discussion about the colonial condition present in the history of the city of Potosí and its great reserves of silver as an allegory for the situation faced by the workers of the mines. The debate that the chapter presents is related to how a colonial condition offers us new manners to think media and in particular, the geological aspects of certain wireless transmissions.

The conclusion addresses three critiques developed throughout the work and stated the result of the thesis. The first critique is towards the idea of wireless and how it relates today to a process which is historically determined. The second critique addresses the Latin American decolonial theory and its formulations over aesthetics, pointing out to the elements that such line of thought missed in terms of analysing communication from a peripheral perspective. The third critique highlights connections and experiences that critical media studies missed when analysing the radio phenomenon, especially related to (anti) colonial radio experiences.

In bibliographical references where the English version was not possible to be used and due to the fact that books and documentation consulted were used from editions in different languages and times, unless noted otherwise, the translations to English are mine.

Notes on Methodology

Due to my interdisciplinary interest and formation, the methods deployed to investigate the questions that this thesis addresses show a combination of practices necessary to grasp such a complex subject from the many aspects which are expected to construct a critical perspective of its nature and social impact. The trajectory of this research – as well as my general interest on the topic – started from an inquiry about the power of the language of technical rationality over culture, particularly on critical media movements from Latin America. Because of difficulties faced in the course of this research and the many lines of inquiries that the object requires, the focus, the subject, the case studies and the critical analysis of the body of work of the theme conformed a mixed-method approach.

Some topics profit from field experience from the years of research and political interventions which marked my path since I encountered the Free Radio movement. This experience gave me a sharp look onto the concepts, actions and debates surrounding the activism of small, communitarian and free radios. Thus, equipped with this ‘pesquisação’ (action-research) cultivated from my involvement with the theme, I was able to develop a perspective in which is necessary to combine knowledges and perspectives in order to propose an hypothesis which lies beyond the simple quantitative results or qualitative approaches, as the proposition of this investigation mandates.

The critical study of the coordination among technology, culture and politics has its roots in the classic sociology through the work of Karl Marx and Max Weber. The German critical theory, the French sociology of culture and the the British cultural studies took that field to the level of mature disciplines with innovative methods and a wide range of subjects of analysis. The discipline of Media and Communication entered deeper in particular aspects, relations and conflicts that features the social thought with particularities of a technological and mediatic society. As such, philosophy, anthropology, media studies, interpretative and materialistic sociology require their presence in the manner in which one has to enter into the topic of the coordination between technology and society.

Since my formative training is in sociology of culture and my field of research is rooted in media and communication, the adoption of principles from the cultural studies seemed to be the natural choice. The practical, academic and intellectual endeavour led me to combine different approaches, which at times might seems awkward and loose, but was the way that was possible to move on according to the complexity of themes, the desire to have a subaltern look and the directions given to me by the unequal steps taken in my scholarly formation.

The challenge in employing this set of methods is also intended to promote connections which expose the division and separation of knowledges, which, despite being useful to apprehend particular investigations within a determined discipline, also impedes the creation of innovative connection leading to new paths to answer theoretical questions. In our case, the question can be framed as how different groups and societies coordinate the electromagnetic spectrum and how the later penetrates and inform the politics of such groups.

Thus, the reader will find in this work a range of styles of investigations which will navigate through the textual analysis of philosophical production about the western concepts which led to the creation of electromagnetic spectrum, personal accounts and field research about the radio universe and primary research into aspects of radio management, free and community radios. Such mixed method permitted to analyse subjects which are formative fragments of the general topic of this work: the social dynamics and coordination between the electromagnetic spectrum and social realities.

Chapter one is grounded in ethnographic approaches which, through secondary sources and comparative analysis intends to present different social and historical contexts that illustrate manner to perceive wireless manifestations and its impacts on social formations. My direct involvement with radio *Amnésia* appears in the form of the interview with Mãe Beth de Oxum and the relationship that can be seen regarding its activities and the theme of spiritual perception over *aethereal* communication.

The second chapter presents an interpretative analysis of concepts used throughout the Western history which conformed the idea of aerial communications in philosophy. It does not intend to be an intensive discussion on matters of the Soul, Aether, Pneuma and Spectrum, but to present an overview of the thoughts that led to epistemic and conceptual construction of the multi-faced aspects of wireless communication. This is made by reading of authors, commentators and critiques that were made onto the subject.

Chapter three and four use primary resources from personal experience, research in archives, databases and historical accounts, besides the critical reading of sources which collaborate and complement such materials. The third chapter lies in the trajectory of the regulatory, managerial and rational disposition of radio waves. Having participated in conferences and meetings dealing with national and international regulation of radio waves and researching from the archives of the International Telecommunication Union (ITU), I intended to construct a connection between the formal organization of regulatory bodies and the ideological formation of romantic aesthetics and individualistic liberal politics. Thus, the method of combining self experience, primary resources

and analytical reading hopes to construct a path from which is possible to connect the organization of the EMS with modernity and its Anglo-Saxon aesthetic perception. The fourth chapter is based on the history and critique of radio politics from a progressive point of view and also uses personal archive material, the aforementioned judicial documentation and self experience in order to account the distinctiveness of the Free Radio movement in the passage from the 20th to the 21st century in Brazil.

Chapter five was written after a thorough analysis of much of the secondary material produced about Radio Sutatenza, added by primary sources archived at the section of rare material of the Luis Angel Arango Library, in Bogotá, Colombia. There, I had access to letters, pedagogical material, audiovisual production and written testimonies. Although it is not a detailed description of Sutatenza's endurance and achievements, I used the knowledge acquired from that research to frame the discussion from a different critical angle, highlighting the aspects of control and dominance in the combination of theology and public policies. Chapter six brings the history of Bolivian miner's radios in contrast to a discussion on media archaeology using studies from testimonial sources and (the relatively scarce) documentation, in a comparative analysis with the theories which departs from a more Eurocentric perspective of the role of media materiality.

Thus, the set of methodology employed in this research reflects my own winding and curious trajectory across the topics, but also a necessary combination of methods in order to understand a subject which is endowed with many layers and has been analysed from different points of views. Furthermore, the steps taken to trace the research line also intend to construct a multi perspective approach which tries to move away from the more traditional and hermetic analysis, since the intention is also to demonstrate how epistemology can be question from within the marks of science, not disregarding it, but adding optics and insights to its body of knowledge.

Chapter 1 – Fragments of Radio’s Ancient Epistemology

Before the existence of Wi-Fi, 5g or Bluetooth,¹² the natural phenomenon responsible for the functionality of such standardized brands was revealed as a physical form named electromagnetism. The range of space created by the interaction between the electric and magnetic waves and their fields was called the electromagnetic spectrum. *Elektron* (amber) and magnet (*Magnetitia*) – matter and place – were early tied together by their philosophical and actual electromagnetic attraction. The term “spectrum”, coined as a baroque science feature in the seventeenth century, added the spiritual, phantasmic, divine and blurry instrumental perception of the reach of such strange form.

What we now call wireless communication is a generic concept that designates technological infrastructures and electronic devices operating the EMS within the range of radio waves.¹³ Moreover, they are ruled worldwide by a standard body,¹⁴ regulated by nation states agencies and its technological novelties are implemented according to technical viability, economic and political interests. In the next 2 chapters, however, we intend to identify that the dominant conception of such space where the radio waves inhabit has a history and is socially determined. Political power, cosmological beliefs, aesthetic experience and perceptions of space have influenced the epistemic construction of this agent which has been identified and historically used as a structural space for communication and expression.

Such spectral space, understood as a construction composed by natural, political and cultural fragments, existed around social groups who were, if not considered at all, at least not determinant in the making of the modern idea and development of the spectral usage for the transmission of electronic and digital signals. Such observation allows us to understand that the current power over the development of wireless communications can be traced back by examining the genesis of its construction as a concept, material reality and technological novelty. Meanings and manifestations that indicate uses and perceptions about the electromagnetic spectrum’s fragments, functions, qualities and properties can be observed in order to inform a critique over the way in which wireless communications are today perceived, managed and politicized. Thus, the outcome of a particular Western vision of a natural phenomenon became the dominant grid for addressing a critique of the inequality, bad regulation, partial and complex access to the wireless space. By taking epistemic alternatives referring to what composes this space, I aim to criticize the current assumption over what the spectrum represents and introduce a different viewpoint of what this aetherial

12 All three are trademarks of technologies used exclusively to operate wireless communication between electronic devices. They are consequences of technical and industrial development and point out for the rationalization, appropriation and standardization of wireless communication in global scale.

13 Radio waves are electromagnetic radiation between 30 hertz and 300GHz which propagates through electromagnetic waves with a wavelength between 10.000Km and 1mm.

14 The International Telecommunications Union (ITU).

communication might manifest. In this part, we briefly examine the relation between space, materiality, nature, geography and power that are present in the formation of landscapes that influences perspectives, possibilities and epistemologies of the wireless space which I assume to be seminal contributions to a decolonial politics for communication.

The electromagnetic spectrum, therefore, is intended to be seen here as a subject that participates in social relations even before its designation as a phenomenon that is technologically activated. Therefore, the spectrum – and the conception of it – is seen as an agent that acts upon the social reality through the perspective that is created for the social and cultural space that it inhabits and the type of communication that it carries.

In this chapter we will take an approach in line with the anthropological tradition of animism and perspectivism, being those part of what conforms an anthropology of nature.¹⁵ Whereas animism appears as “the social character of the relationships between the human and non-human series” where “the gap between nature and society is itself social”,¹⁶ perspectivism claims that “the spirits which inhabit the universe are not immaterial entities, but equally types of bodies endowed with properties (...) or phenomenological perspectives”.¹⁷ Throughout the thesis, we also assume the perspective given by the idea of culture as a system of meanings, central element to understanding social realities. Thus, active practices and states of mind can be analyzed in their interrelationships with institutions, languages, mentalities, economics and politics. The aesthetic element is here taken as pivotal and considered, as Raymond William points out, not under the categories of value, symmetry, harmony, proportion, and talent, but rather originally delimited “by the nature of the practice”.¹⁸ In this way, the analysis – although brief – of the examples below, will allow us to understand productions, functions and an existence in itself of alternative formulations to that of a discovery, invention and activation of the radio spectrum as if it was a preexisting object waiting for the modern technology in order to come into being.

Thus, I intend to understand the spectrum not as something discovered by nineteenth century technology, but as an entity with messages, policies and aesthetics that are given by others and by

15 The anthropology of nature draws on the ideas of extensive nomenclatures of the different elements of the world, systems of values and negotiations between humans and non-humans, the ontological and cosmological relation between natural objects and social formations and the “interface between the biological, the cultural, and the social”. See: Philippe Descola, *The Ecology of Others*, trans. by Genevieve Godbout and Benjamin P. Luley (Chicago: Prickly Paradigm Press, 2013), p. 85.

16 “o caráter social das relações entre as séries humana e não-humana: o inter-valo entre natureza e sociedade é ele próprio social.” Eduardo Viveiros de Castro, ‘Os pronomes cosmológicos e o perspectivismo ameríndio’, in *Mana* (Vol.2, No.2, 1996) p. 121. Unless otherwise noted, and in the case of absence of English version, all the translations of texts in Portuguese, French and Spanish are my own.

17 Eduardo Viveiros de Castro. ‘Cosmological Deixis and Amerindian Perspectivism’, in *The Journal of the Royal Anthropological Institute* (vol. 4, no. 3, 1998), pp. 469-488. p. 481.

18 Raymond Williams, *Cultura* (São Paulo: Paz e Terra, 2008) p. 125.

its very own existence, with specific forms and properties in different social constructions and epistemologies. In order to do so, it is required that we examine histories of the ideas that precede the creation of the present wireless technologies and also understand the lines and influences which made its current idea the dominant perspective about them. As such, the methodological perspective is taken from a tradition which criticizes the analysis from the point of view of Western modern divisions between subject and object, nature and culture, generalization and individualization, which marks the historicism and the mentality of coloniality.

In addition to the idea of spectrum constituting a style, function, characteristics, properties and specific qualities depending on its social interactions, I seek to understand aspects of this montage which I consider to be important conceptually for the policies and theories of media resistance, particularly inserted in (counter) colonial contexts. Thus, anchored in the role of operator of an expression of the space, we identify material and epistemic fragments that allow us to alternatively understand this composition that goes beyond the economic, legal and technical imperatives of its current instrumental understanding. Those two initial chapters will help us to put together the argument of the thesis in which the domination of technique, legislation and politics is not just a matter of content regulation, conditioning audiences or democratic policies. These dominations appear as guarantees for the perpetuation of a perception established by an order, in which conceptual aesthetics have a fundamental role and in which colonialism and coloniality deeply mark their justification.

The division elaborated by Hegel in which the spiritual and material order of the objects is separated in the sciences (of nature or of culture) finds in the examples below a challenge. The philosopher assumes that the objects of the physical sciences, such as “sun, stars, magnetic phenomena, etc (...) are taken from experience of the external world, and instead of *proving* them, it is thought sufficient to *point* to them.”¹⁹ That would presuppose that a physical phenomenon such as the radio waves is a given fact, everlasting equal and provable by its particular definition. However, Hegel himself demonstrates the confused interaction between objectivity and subjectivity on the matter of magnetism calling it a “dark power” and an unknown force which, “on the one hand is within himself, but on the other hand is a beyond, alien to his inner life, by which [the individual] is determined and ruled”. Arguing against the contamination of art by “the province of magic, magnetism, demons, the superior apparitions of clairvoyance, the disease of somnambulism, etc”, he states that “From the sphere of art, however, these dark powers are precisely to be banned, for in art nothing is dark; everything is clear and transparent”.²⁰

19 G. W. F. Hegel, *Aesthetics: Lectures on Fine Art*, Vol.1, trans. by T. M. Knox (Oxford: Clarendon Press, 1975) p. 23.

20 G. W. F. Hegel, *Aesthetics*, *ibid.* p242 – 243.

Meso-America: Magnetic Aesthetics of Space and Time

The role of the relation of the spectrum's composites with nature, serving as elements of power, spatial control and aesthetic expression can be traced from different social contexts. Magnetism, as one of the active composites pertaining to the EMS, has a history as media which lies beyond the discovery of its interaction with electric charges. As important cultural element for the politics which surrounded its applications, the political, spiritual, spatial and artistic role of the spectrum can be understood observing its historical use.

In his vision of sky media, John Durham Peters considers the calendar as “preeminent signal of identity, and instrument of institutional control”,²¹ being in this sense both natural and cultural as well as serving as a “media”. The power of controlling time and perception of space is not a separate rational and instrumental definition, but “a massive program that directed agriculture, war, reproduction, labour, and religious ritual”.²² Thus, he claims that the Aztecs, by managing the calendar, “had what Innis would call a ‘monopoly of knowledge’ in reckoning dates and declaring auspicious and inauspicious times”. One should remember that the role of measuring time and regulating the infrastructure and standards of wireless communication is responsibility of international agencies of technical and scientific developments, such as the IAU²³ (International Astronomic Union) and ITU (International Communications Union), which exerts a powerful influence in the way we perceive both temporality and space.

From as early as 2000 BC²⁴ the Monte Alto culture carved sculptures in magnetized stones, in what can be considered as the first documented aesthetic use of the energetic properties of the lodestone. Likewise, it is recorded that the Olmec civilization had awareness of the geo-referential properties of magnetism, exploring “orientations from a geomagnetic as well as an astronomical perspective”.²⁵

Dartmouth geography professor Vincent Malmström investigated the geographic position of Mayan architectural structures according to their relation to astronomical alignments in order to demonstrate that Olmecs were aware that at a certain latitude it was possible “to measure the 260-

21 John Durham Peters, *The marvellous clouds: Towards a philosophy of elemental media* (Chicago: The University of Chicago Press, 2015), p. 189.

22 John Durham Peters, *The marvellous clouds*, *ibid.* p. 192.

23 Heir of the International Meridian Conference which took place in Washington D.C in 1884 and established the United Kingdom Greenwich meridian as the zero degree longitude, the IAU cooperates with many bodies in themes such as astronomy, astrophysics and celestial names and standards.

24 See: A.P. Guimarães, ‘Mexico and the early history of magnetism’, in *Revista Mexicana de Física* (E50, vol.1 pp. 51–53, 2004); John B. Carlson, ‘Lodestone Compass: Chinese or Olmec Primacy: Multidisciplinary analysis of hematite artefact from San Lorenzo, Veracruz, Mexico’. in *Science Magazine* (vol.189, n.4205, 1975), pp. 753-760.

25 John B. Carlson, ‘Lodestone Compass: Chinese or Olmec Primacy’, *ibid.* p. 775.

day interval between transits of the sun at its zenith simply by counting the number of days between the times an upright stake or pillar cast no shadow”.²⁶ In the site of *Izapa*, he noticed that the positions of local sculptures had a pattern for spatial orientation and found “that a carving depicting a turtle’s head, which could date back as far as 1500 BC, possessed a strong magnetic field, concentrated in its snout”.²⁷ Knowing that turtles can find their way around the sea and back to their original birthplaces through magnetic sensitiveness, Malmström speculated about the reason for the Olmecs to shape their magnetic sculptures in turtle form.

The argument defending the combination between aesthetic and spatial awareness through the use of magnetism by the Olmecs comes from a discovery made in 1979 from outside a museum in the city of La Democracia, where some sculptures originally from the site of Monte Alto are displayed. They are “representations of human figures and heads carved on five-to-ten-ton basaltic boulders, six or seven feet in diameter”²⁸ known as “fat boys”. They are dated from 2000 BC and featured magnetic charged stones situated on the navel and/or the temple.²⁹ Those sculptures represent probably the most ancient magnetic artefacts in the world. The absence of iron production at that time poses the mystery about the utility of magnetic properties within the sculptures. The artisans did not insert the magnetic stones, but rather carved the stones around a magnetic rock, shaping it in a way in which the magnetic poles were located in the right temple, right ear or left temple.

Researches in Guatemala also demonstrated that the orientation guidance of the compass was used by the Olmecs³⁰ from the examination of a small artefact firstly thought to be fragments of ornamental sculpted mirrors. The artefact, named M-160³¹ and described as “a small, carefully shaped, highly polished rectangular bar of hematite with a trapezoidal cross section”³² was measured by the use of 57Fe Mossbauer technique of spectroscopy, which employs the spectral

26 Dan Nelson, ‘Temples, Turtles and Fat Boys: The origins of Mesoamerican mother culture’ (*Dartmouth Alumni Magazine*, vol. 72, n. 1, 1979), pp. 36-38, p. 37. Available at <<https://documents.us/document/codices-mayas14.html>>.

27 Dan Nelson, ‘Temples, Turtles and Fat Boys’, *ibid.* p. 38.

28 Dan Nelson, ‘Temples, Turtles and Fat Boys’, *ibid.* p. 38.

29 “If the sculpture depicts a head, it is often magnetic in the right temple. If it depicts a body, its magnetic pole is usually near the navel”. Vincent H. Malmström, *Cycles of the Sun, Mysteries of the Moon: The Calendar in Mesoamerican Civilization* (Austin: University of Texas Press, 1997), p. 33.

30 Besides this innovative use of magnetism, Olmecs are recorded as the first civilization to acknowledge the zero, being responsible for pioneering cultivation of tomato, cocoa, pepper and “three-fifths of the crops now in cultivation”, hieroglyphic writings and organizational structure which gave birth to most of mesoamerican social structures. See: Charles C. Mann, *Antient Americans. Rewriting the history of the new world* (London: Granta Books, 2005) & M. D. Coe, *The Olmec World: Ritual and Rulership* (Princeton: Art Museum of Princeton, 2003).

31 “That M-160 could be used today as a geomagnetically directed pointer is undeniable. The original whole bar may indeed have pointed close to magnetic north-south. The groove functions well as a sighting mark, and the slight angle it makes with the axis of the bar appears to be the result of calibration rather than accident.” John B. Carlson, ‘Lodestone Compass’, *ibid.* p. 759.

32 John B. Carlson, ‘Lodestone Compass’, *ibid.* p. 757.

combination of matter and energy to determine the radiation emitted by an object through the measurement of its waves.

This iron ore object were dated from the Olmec early formative period (1000 BC - 800 BC) and located in the states of Veracruz and Tabasco, where figurines made of Jade containing a small flat piece of magnetized ore in its chest were found. Initially, what “were simply scientific curiosities, exhibiting great technical skill on the part of their manufacturers”³³ ended up indicating that “the Olmec may have discovered and used the geomagnetic lodestone compass earlier than 1000BC, pre-dating the Chinese discovery by more than a millennium”.³⁴ B. J. Evans observed that when floating freely in a heavy liquid, the piece would “align its long axis 35° west of magnetic North”, being likely that the “bar-shaped artefact could have been used in some instances as a local orienting device with the groove serving as a sighting line”.³⁵ In his conclusion, the researcher states that:

their function was primarily non-utilitarian and they were used principally as body adornments. It is probable, however, that a small number of iron ore artifacts were used in esoteric architectural or geomantic applications. If the unusual bar-like artifact with the strong magnetic remanence should prove to be part of a direction finding device, this device would predate the discovery of the compass by the Chinese by more than a millennium.³⁶

The scientific curiosity aligns to what I think is a secondary importance of the magnetized object. Although it seems that directional functionalities existed in Olmec carving and artefacts, it was not its unique or even primary function. The scientific priority is exposed by the concern with the competition between China and Meso-America regarding the earliest use of magnetism in its technical functionality as a compass, assuming that such feature is more important than the aesthetic function, political signification and cultural meaning. The politics of scientific knowledge here is given by the absence of the inquiry over if the compass was a casual consequence of the magnetism embedded in the object, which might have served primarily instead as a connection of aesthetic and geographic purposes.

From its role in following the development of astronomical calendars, political status, artistic sculptures, directional references as well as architectural constructions, the use of magnetism seems to be a formative part of the connection between the geographic space, the measurement of time and material symbolism of social structures. It is useful to also mention magnetism as one of such elements of aesthetic power, for its concretization in the form of objects also “took form in concrete

33 B.J. Evans, ‘Magnetism and Archaeology: Magnetic Oxides in the first American civilization’ in *Physica* (86-88B, 1977) pp. 1091-1099.

34 John B. Carlson, ‘Lodestone Compass’, *ibid.* p. 759.

35 B. J. Evans. ‘Magnetism and Archaeology’, *ibid.* p. 1097.

36 B. J. Evans. ‘Magnetism and Archaeology’, *ibid.* pp. 1098 – 1099.

works of sculptural art in stone”.³⁷ The insertion of aesthetic and spatial elements of lithic fragments that act as the central composite of a wireless media allows us to understand the geographic materiality as a central fragment of the political role of the magnetic field.

Therefore, before the establishment of the precision compass, it was already possible to interpret the use of magnetism as a form of exercising power through its influence on the calendar and the spaces it occupied. In this way, the idea of a sky media, as a form of power and communication can be identified through rudimentary uses and linked to rituals, divinations, aesthetic expressions and geographical positioning. The relationship between matter and magnetism occurred not only to adorn figurines and sculptures, but also contributed to the construction of knowledge of space and time, and, more recently, to reveal that such a relationship also existed for orientational purposes through modern techniques of spectroscopy.

China: Compass of Attraction and Orientation

Shu-Hua, in his article “Origine de la Boussole II”,³⁸ refers to the Chinese word *ts’eu-che* [爱的石头] to explain the meaning of the word “*aimant*”³⁹ as “stone that loves (*pierre qui aime*), *aimant naturel* in French”, quoting a passage from the “History of medicinal plants”, from 1580, in which Li Che-Tchen writes that “the magnet (*aimant*) attracts iron as a mother has to make her children come to her, and this is why this name is given to it”.⁴⁰ Therefore, Shu-Hua concludes, based on Klaproth⁴¹ and on the idea that if the stone did not love the iron, they would not attract each other, that the French word *Aimant* is a translation from the chinese *ts’eu*, meaning “love”. Shu-Hua also identifies the mention of magnetic cultural manifestation in a passage from a work from the period of the Royal Warriors (403 BC - 221 BC) which states that “the lodestone brings the iron or it attracts it”,⁴² and, arguing that magnetism was connected to a specific stone which attracts and “give direction” to a needle, concludes that “the polarity of the magnet is known in China since almost the start of the Christian era”.⁴³ Even though today the compass means a sole

37 John Durham Peters, *The marvellous clouds: Towards a philosophy of elemental media* (Chicago: The University of Chicago Press. 2015) p. 192.

38 Li Shu-hua. ‘Origine de la Boussole II. Aimant et Boussole’ in *History of Science Society* (vol. 45, n. 2, 1954), pp. 175-196.

39 Which, in Latin based languages takes the form of *imã* (Portuguese), *imanes* (Spanish), also similar to the word *amor*, *amour* (love).

40 “*L’aimant attire le fer comme une mère tendre qui fait venir ses enfants à elle et c’est pour cette raison qu’il a reçu son nom*”, Quoted by Li Shu-hua, ‘Origine de la Boussole II’. p. 175.

41 M. J. Klaproth, *Lettre a M. Baron A. de Humbold sur l’invention de La Bussule*. (Paris, 1854). Available at <<https://archive.org/details/bub_gb_ciHESLFKUjoC>> Accessed 7 Nov 2016.

42 “La pierre d’aimant fait venir le fer ou elle l’attire.” Li Shu-hua, ‘Origine de la Boussole II’. *ibid.* p175.

43 Li Shu-hua, ‘Origine de la Boussole II’. *ibid.* p176.

object, with specific determinations and functions, rationally determined and standardized, we can notice the difference between the conception elaborated and used for orientation between Chinese and Olmec society.

The text “Guiguzi” (spelled also *Kuei Ku Tzu*), translated by some as “The sage of the Ghost Valley” and by others as “Book of the Devil Valley Master”, written around the fourth century BC, is inscribed in the tradition of philosophical and behavioural texts of ancient China. Addressing the subject of persuasion in belletristic manner, it was written in a poetic structure “calculated to have an effect on an emotional level not a logical one”.⁴⁴ In a study of this text, Brochat identifies it as a “reflection of thought about the general topic of rhetoric and persuasion in particular”, which he understands as a manifestation concerning the strategy of the Chinese “intellectual and cultural development”⁴⁵ opposed to that of a Western “search for truth”. Needham and Yates reflect on the same text from the perspective of a general theory of action, pointing out that the book guides directions towards “the need to adjust to the forces of Yin and Yang, to the changes of the five elements, and to appropriate time”.⁴⁶ The section of the “devil valley master” in which the magnetic force is addressed is translated by Broschat as follows:

Therefore, to know things, begin with oneself. Know yourself first and then know about the others. This two part understanding is like the paired-eyes fish. The appearance it takes on is like light with shadows. And in the scrutiny of what is said, nothing is missed. It is like lodestone attracting a needle and the tongue seeking barbequed ribs.⁴⁷

The paragraph curiously relates the magnetic attraction power with the oppositional symmetry of the Yin and Yang reflected in the knowledge about oneself and the other. The “two part understanding” of this symmetry looks like a ghostly unsubstantial shade inside which operates an alert ear to constant voices. It also draws an analogy among a sentiment (love), quality of the senses (taste and gaze) as well as the language by which every scrutiny is captured, in a sort of synaesthetic composition. Above all, every aesthetic and semantic message is interacted under a political principle, that of knowing things by knowing yourself and the others.

The “Devil Valley Master” also mentions spatial references and orientation from the use of a “south pointing carriage” by Jade hunters: “Therefore, the way people of Zheng obtain Jade is to ride in a south-pointing carriage so they will not lose their way”.⁴⁸ The concept of “south-pointers” are referred to as being similar in affairs to “evaluation of ability, survey of capability and

44 M. R. Broschat, *Guiguzi: A textual Study and Translation* (PhD Thesis, University of Washington, 1985) p. 2.

45 M. R. Broschat, *Guiguzi*, *ibid.* p4-5.

46 Joseph Needham & Robin D. S. Yates, *Science and Civilization in China* (Cambridge: Cambridge University Press: 1994) p. 31.

47 M. R. Broschat, *Guiguzi*, *ibid.* pp. 143-144.

48 M. R. Broschat, *Guiguzi*, *ibid.* p. 176.

measurement of feeling”,⁴⁹ indicating that directional properties of magnetism also relate to guidance and discovery interoperated with desired and oriented action. It is of symbolic relevance that the early writings to address magnetism, aside from pointing out to orientation and political drive through feelings and persuasion, can be also interpreted as related to forms of communication regarding spatial and economic conquest.

The records for the mention of a “magnetized needle” indicating the technical use of magnetism to serve as compass are from the first two centuries of the first millennium. Two kinds of compass are said to be used in ancient China: an “south-indicator (...) built by cutting a magnet stone in the shape of ‘chao’, drinking cup with a long handle, in the shape of an ellipsoid and almost spherical at the base”⁵⁰ and a “small magnetized dish shaped like a fish that floated on water”,⁵¹ described by Tseng Kung Liang as

a thin leaf of iron is cut into the shape of a fish two inches long and half an inch broad, having a pointed head and tail. This is then heated in a charcoal fire, and when it has become thoroughly red-hot, it is taken out by the head with iron tongs and placed so that its tail points due north. In this position it is quenched with water in a basin, so that its tail is submerged for several tenths of an inch. It is then kept in a tightly closed box. To use it, a small bowl filled with water is set up in a windless place, and the fish is laid as flat as possible on the water surface so that it floats, whereupon its head will point south.⁵²

Fig.1 - “Coupe indicatrices-sud placée sur le plateau” & “Poisson montre-sud” by Wang Tchen Touo. In: Li Shu-Hua. ‘Origine de la Boussole II. Aimant et Boussole’ in *History of Science Society*, (vol. 45, n.2, 1954), p181.

49 “South-pointing would appear to refer to an established concept here, although logically it is possible to credit coincidence with GGZ’s extraction of the south-pointing idea of carriages to a concept of guidance and the parallel concept derivative of magnetic action”. M. R. Broschat, *Guiguzi*, *ibid.* p. 177, n.63.

50 “indicateur-sud (...) construit en taillant une pierre d’aimant en forme de ‘chao’, coupe à boire à manche long, en forme d’ellipsoïde et Presque spherique à la base”. Li Shu-hua, ‘Origine de la Boussole II’, *ibid.* p. 180.

51 Paul Lorraine, François Lorraine & Stéphane Houle, *Magneto-Fluid Dynamics: Fundamentals and Case Studies of Natural Phenomena* (New York: Springer, 2006), p. 5.

52 Tseng Kung-Liang, *Compendium of Important Military Techniques* (1044AD), Quoted by Robert Temple, *The Genius of China* (Prion, 1998) p. 155.

Similar to the mechanism used in this “fish-watching-south”, there was also a wooden “turtle-watching-south”, suspended by a bamboo stick over a wooden plate with a magnetic needle in its tail. Their uses, nevertheless, were not for utile directional purposes as we understand it in present conventions, albeit they can be regarded as aesthetic objects representing a meaningful composition for the perception of directions.

At the end of the thirteenth century, there are records which indicate the first use of a compass at sea, hence, having a different use from that of divination, geomancy, aesthetic or magical properties. Shu-Hua also describes a text in which Siu King narrates a ship navigation from K'ai-Fong to the capital of Korea: “That night, it was impossible to stay at the ocean. One can only steer the boat when watching for the stars. If the sky becomes dark, one trusts the floating south-pointing needle in order to distinguish the south and the north”.⁵³ This passage would show the first detour on the use of the artefact, taking it to serve for orientation in travels, what makes us think of deviate uses from aesthetic and magical purposes to a more functional, instrumental way.

53 “Cette nuit, il est impossible de rester sur l’océan. Seul on dirige le bateau en observant les étoiles. Si le ciel deviant obscur, on se sert de l’iguille montre-sud flottante afin de distinguer le sud et le nord”. Siu King. Che-Kao-Lo-Lou, *Memoire sur la mission em Corée*. Quoted from Li Shu-hua, ‘Origine de la Boussole II’, *ibid.* p. 192.

The Andes: Stones, Mountains and Territory

In the ninth chapter of “The devil and commodity fetishism in Latin America”, Michael Taussig examines the “iconography of nature” of *Aymara* communities in the Bolivian *altiplano*, describing it as a set of material and sensible echoes which interrelate within “one living structure that is the language of the magical landscape”.⁵⁴ Differently from the “mushy totality” of the Hegelian Spirit or of Plato’s Soul, nature’s spatial power is worshipped either as forces that “radiate through universe” but also, can “be more or less confined to objects which are ‘charged’ with them”.⁵⁵ Thus, nature’s structure is present in “conspicuous objects” that have a “spiritual nucleus that plays an active role in the life of its surroundings”⁵⁶ which constitute and are constituted by spaces and social organization. Nature and its objects, therefore, appear as an “organic resonance of orchestrated social representations”,⁵⁷ illustrating yet another perspective about how a sort of spectral media can be constructed.

Taussig assumes that mining rituals and the sculptures of the devilish protector of the mines – the *Tio* – are forms of art which he relates to Marcuse’s idea of an aesthetic dimension in which the “realization of art” “as a form of reality” is opposed to the “extreme estrangement and dissociation from all immediacy”.⁵⁸ As a dimension in which the petrified world speaks and sings,⁵⁹ this aesthetics is related to “rituals of the oppressed” as an enchanted response carried by the historical trajectory of indigenous population into colonial and post-colonial society as a “protective barrier behind which native tradition and rituals have been able to maintain themselves thanks to their clandestine practice”.⁶⁰ As such, this operation between materiality and cosmology which finds in aesthetics and nature a form of resistance, is also a political force which should be considered to understand the colonial aspect of communication control.

54 Michael Taussig, *The devil and commodity fetishism in Latin America* (Chapel Hill: University of North Carolina Press, 2010), p. 167.

55 Michael Taussig, *The devil and commodity fetishism*, *ibid.* p. 164.

56 Michael Taussig, *The devil and commodity fetishism*, *ibid.* p. 164.

57 Michael Taussig, *The devil and commodity fetishism*, *ibid.* p. 167.

58 Herbert Marcuse, ‘Art as Form of reality’, in *The collected papers of Herbert Marcuse: Art and Liberation* (London: Routledge, 2007) pp. 146-147.

59 Although Taussig uses those words, Marcuse’s section goes as “There is a phrase of Marx: ‘these petrified [social] conditions must be forced to dance by singing to them their own melody.’ Dance will bring the dead world to life and make it a human world. But today, ‘their own melody’ seems no longer communicable except in forms of extreme estrangement and dissociation from all immediacy—in the most conscious and deliberate forms of *Art*. I believe that ‘living art’, the ‘realization’ of Art, can only be the event of a qualitatively different society in which a new type of men and women, no longer the subject or object of exploitation, can develop in their life and work the vision of the suppressed *aesthetic* possibilities of men and things— aesthetic not as to the specific property of certain objects (the *objet d’art*) but as forms and modes of existence corresponding to the reason and sensibility of free individuals, what Marx called ‘the sensuous appropriation of the world’. The realization of Art, the ‘new art’ is conceivable only as the process of constructing the universe of a free society—in other words: Art as Form of reality.” Herbert Marcuse, ‘Art as Form of reality’, *ibid.* p. 146.

60 Michael Taussig, *The devil and commodity fetishism*, *ibid.* p. 160.

As arrangements which engender a “living and animated structuralism”,⁶¹ the realization of the integrity between nature, community and individual body expressed by “clandestine” rituals, exemplifies the manner by which the territory, and in particular, the mountains, are worshipped and conceived:

The sacredness of the mountain is dependent on its wholeness: of nature, of the social group, of the person, and of all three together. Rituals provide the constant rekindling of the body gestalt, and this gestalt ensures the cycling of reciprocal economic exchange binding people to each other and to the land.⁶²

The land’s most imposing connection with social life, supernatural manifestations and individual life are the mountains. As irrepressible and most powerful part of this landscape, they are inhabited by deities, and individuals themselves are inhabited by the mountains since such icons were once humans and humans were initially made of natural matter: “The living emerges from nature, which perforce becomes a sacred geography of mountains, lakes, and slopes, and the lineage heads pass back into the huacas”.⁶³ Huacas, or Waka’s, one of those charged objects which materially and geographically participate in the structuring of nature’s iconography, “testimony to the constant recreation of life and society, in which the cycles of human birth and death circulate within the larger cycles of communal rites to the landscape and (...) to the origin of mankind”.⁶⁴ Here, matter, signifier and social collective formation appear as the radical opposite of hylomorphism and the general separation between form and content.

Waka’s are frequently lithic constructions of that nature’s iconography which “defy the dualism of the unmarked (but not unstated), putative Cartesian ontology (...) by circumventing the spirit/matter dichotomy altogether”.⁶⁵ If, as this thesis understands, the electromagnetic spectrum carries a conceptual confusion which was turned familiar by the ordination of its environment, one could have the description of waka’s in mind as alternative definition: powerful “sacred things” which “constitute a fascinating point of intersection with respect to notions of materiality, agency, and personhood”.⁶⁶

61 Michael Taussig, *The devil and commodity fetishism*, ibid. p. 164.

62 Michael Taussig, *The devil and commodity fetishism*, ibid. p. 157.

63 Michael Taussig, *The devil and commodity fetishism*, ibid. p. 167.

64 Michael Taussig, *The devil and commodity fetishism*, ibid. p. 167.

65 Zachary J. Chase, ‘What is a Wak’a? When is a Waka?’, in *The Archeology of Wak’as: Explorations of the sacred in the Pre-Columbian Andes*, ed. by Tamara L. Bray (Denver: University Press of Colorado, 2015) p. 76.

66 Tamara L. Bray, ‘Andean Wak’as and Alternative configurations of persons, power, and things’, in *The Archeology of Wak’as*, ibid. p. 4.

Frank Salomon and George Urioste explain that waka's are "made of energized matter, like everything else, and they act within nature, not over and outside it as Western supernaturals do".⁶⁷ Very much present in Andean cosmological world-views, they relate to an extremely powerful agency which interplays with the notions of space, spirit, matter, personhood and communication. The complex formulation of multi-functional and multi-form elements within the concept of Waka's were poorly simplified by Spaniards in translations and summarized as sorcery, divination, superstition or magic.⁶⁸ It is waka's material interactions and exchanges which provides its ability to communicate and renders them the quality of oracle as well as its recognition as a person, an object, a biography, a connection and an outfit. Instead of mediating between separate instances, they present themselves as an immediate sensory which is distinctive by its "hardness, texture, colour, composition, mineralogy and place of origin".⁶⁹

Garcilaso de la Vega⁷⁰ referred to waka's as being a wide range of objects or "sacred things" through which the devil spoke.⁷¹ Such objects could come either from nature or be constructed and cultivated by men which enacted irregular events "that caused surprise or fright".⁷² Think here on the close relation that one has with the pleasures and sacred acts of fixing a transmitter as compared to the ready-made technological alienation of media integrated system. The intimate connection with the composition of technical objects generates a sort of religious (as in *religare*) feeling which is similar to the sacralization of natural objects. However, for the fact that waka's cannot be isolated from human and communitarian formations, their agency "is characterized by the activities of these entities perceived and described by the native population", being "socio-politically generative" and "temporally originary".⁷³

In this sense, Zachary Chase proposes to understand waka's through "performativity", that is, as "semiotic acts that (...) are intended to bring about changes in the world, as opposed to those which merely describe or reflect current realities".⁷⁴ Described as a "full poetic realization", the

67 Frank Salomon & George Urioste, *The Huarochirí Manuscript. A testament of ancient and colonial Andean region* (Austin: University of Texas Press, 1991) p. 19.

68 See: Claudia Brosseder, *The power of Huacas: Change and resistance in the Andean world of colonial Peru* (Austin: University of Texas Press, 2014). Brosseder develops a discussion related to religious power and the conflicts between the Andean perspective and the Spanish explanation, focused on discourses of *Hechizeros*. (sorceress).

69 John Janusek, 'Of Monoliths and Men: Human-Lithic Encounters and the Production of an Animistic Ecology at Khonkho Wankane', in *The Archeology of Wak'as*, *ibid.* p. 337.

70 See: Garcilaso de la Vega, *El Inca. [1609] Comentarios reales de los Incas*, ed. by Angel Rosenblat (*Vol. 1*, Buenos Aires: Emece Editores, 1943).

71 See: Tamara L. Bray, 'Andean Wak'as and Alternative configurations', *ibid.*

72 Catharine J. Allen, 'The whole world is watching – New perspectives in Andean animism', in *The Archeology of Wak'as*, *ibid.* p. 23.

73 Zachary J. Chase, 'What is a Wak'a? When is a Waka?', *ibid.* pp. 80 – 81.

74 Zachary J. Chase, 'What is a Wak'a? When is a Waka?', *ibid.* p. 78.

performance in radio reception, as understood by Paul Zumthor, “besides a know-how (*savoir faire*) (...), also manifests a know-being (*savoir-être*) in time and space”⁷⁵ that, being a vocal actualization which justifies reality, includes a “sonic part of a significant whole where colours, smell, mobile and immobile shapes, animated and inert (...) [appears] as an auditive part of a sensory whole”.⁷⁶

Catherine J. Allen links the idea of waka’s in colonial times to powerful objects which served as coordinates for the Inkaic society to geographically organize itself radially from its capital. The architectural and geographical positioning of waka’s served as to enforce and expand the Inkaic empire by incorporating the definition of “nature” as space while justifying the creation of a State around this spatial definition. In order to rule and differentiate Inkas from pre-inkaic populations, the empire created a social and spatial system which radiated from their capital, Cuzco:

By categorizing social groups, marking fields, and naming wak’as, the Inkas shaped new political subjectivities (...) and (...) altered the essential relationships between people, place, and land that structured personhood in the Andes.⁷⁷

Such alteration was possible due to the notion of environment and the “naturalization” of a social order, for such constructions were perceived not as “an a priori state of being or a set of resources”, but as a “political claim”:

These places are designed to be sites of authorization where people, through their political and religious conviction and commitment, are meant to recognize or revere the power of a state. But these places are also potential sites of subversion where people challenge and reject the universal and naturalizing propositions of the state. After all, the “nature” that these places embody is a politically contested and socially manifested claim.⁷⁸

Here waka’s refer to disturbances in landscapes, an extraordinary animated topology which functions as “tools in the creation of their [Inca or Aymara] empires and the replication of icons of power”.⁷⁹ As a powerful conception of the combination amongst architectural works that features spiritual properties of communication which determine the rule of the empire, waka’s also helps us to understand the manner by which the epistemology constructed over a multilayer definition leads to a particular social order and its cultural expansion.

75 Paul Zumthor, *Introdução à Poesia Oral* (São Paulo: Editora Hucitec, 1997) p. 157.

76 “parte sonora de um conjunto significante, onde entram cores, odores, formas móveis e imóveis, animadas e inertes (...) como parte auditiva de um conjunto sensorial”, Paul Zumthor, *ibid.* p. 164.

77 Steve Kosiba, ‘Of Blood and Soil: Tombs, Wak’as and the naturalization of social difference in the Inka heartland’, in *The Archeology of Wak’as*, *ibid.* p. 172.

78 Steve Josiba, ‘Of Blood and Soil’, *ibid.* p. 198.

79 M. Van de Guchte, ‘The Inca Cognition of Landscape: Archaeology, Ethnohistory, and the Aesthetic of Alterity’, in *The Archaeologies of Landscapes: Contemporary Perspectives*, ed. by W. Ashmore and B. Knapp (Oxford: Blackwell, 1999), pp. 149–168. p. 155.

Silvia Rivera Cusicanqui refers to this type of domination and vision of resistance when writing about new colonial waka's, demonstrating the ruling arrangements that can be operated when one has the power of meaning, space and communication:

The Church and Money, new colonial wak'as, are thus inscribed in a dense and laboriously constructed semantic fabric, connecting distant spaces in a Pan-Andean framework that re-updates the gestures, motives and practices of meaning, which decipher and penetrate through cracks of colonial violence, rearticulating the unhinged, joining forces to mend the 'network of holes' in which the cosmos was transformed for the people of the Andes.⁸⁰

It is regrettable that Cusicanqui is unable to see the media, and particularly, the role of the electromagnetic space as also a colonial waka's, which operates in analogous form from that of church or money, calling for the sacred act of connection, spatial domination and revelator of a meaning which justifies its own power perpetuation.

This thesis, therefore, understands that such absence of separation between the symbolic and the concrete, or the power in which nature is invested and which change the meaning of the symbolic leads to a broader understanding about the significance of domination and exploitation. The explanatory manner in which one determines the value, uses and compositions of a complex set, such as it is the electromagnetic spectrum, subsumes the relation that such meaning has regarding the concrete, laborious, natural and human aspect of its construction. Knowledge, consciousness and awareness over the "media" infrastructure and its creative production has to conceive a meaning in which its many immediate fragments of expression take part.

The radio-spectrum, therefore, should be signified "Alongside storytelling, song, dance, ritual, kipus, pottery design, etc." in transmitting "knowledge, historical memory and belonging through the meanings they attribute to ruins, to mountains, lakes and waka's".⁸¹

80 "La Iglesia y el Dinero, nuevas wak'as coloniales, se inscriben así en un tejido semántico denso y laboriosamente construido, conectando espacios distantes en un marco pan-andino que reactualiza los gestos, motivos y prácticas de sentido, que descifran y penetran por las grietas de la violencia colonial, rearticulando lo desquiciado, juntando fuerzas para remendar la "red de agujeros" en que se transformó el cosmos para las gentes de los Andes." Silvia Rivera Cusicanqui, 'Otra mirada a la totalidad', in *Principio Potosí Reverso* (Madrid: Museu Nacional de Arte Reina Sofia, 2010), p. 2.

81 Freya Schiwy, 'Indigenous media and the end of the lettered city', in *Journal of Latin America Cultural Studies* (Vol.17, n.1, Taylor and Francis) pp. 23-40, p. 33.

Brazil: A Trickster Orixá

To demonstrate how sophisticated and complex is the relation between technique, spirituality and electronic wireless communication in counter colonial arena, one could also take into account the role of Afro-Latin beliefs and its contemporary perception of the technological universe of communications. The *Iorubá* cosmological principle (which influenced the Brazilian *candomblé*, the Cuban *santería* and other Latin-American cultural expressions of religion), divides the sites of the universe in *Orun* – the supra-natural world inhabited by deities – and *Aiye*, the physical world dwelt in by humanity. The *Orixá* responsible to communicate one world with another is *Exú*, also known as *Esú* or *Papa Legba*. Nonetheless, this two-level division does not mean a separation, as conceived by Western tradition. The deities, or *Orixás*, interfere materialistically in the world and each one of them have particular personalities, weaponry, characteristics, and natural domain which directly influence in the human world.

Intermingled with *Iorubá* greetings such as *Iparrê* for *Iansã* and *Salubá* for *Nanã*, Mãe Beth de Oxum, a community organizer of Recife, explains that “for us, the atom of communication is *Exú*, he is the element of communication”.⁸² In her house (a space of cultural and spiritual communion of African-American traditions), she hosts a free radio since 2006 called Radio Amnésia (Amnesia Radio).

Exú, as the “black mythology archetypal signifier”, is depicted by Henry Louis Gates Jr. as the “guardian of the crossroads, master of style and the stylus, phallic god of generation and fecundity, master of the mystical barrier that separates the divine from the profane world”.⁸³ He plays a role as a pesky mediator and a trickster known by his “wit, ingenuity and ability to deceive” who, by “presenting everything that is anomalous, (...) undermine univocal views of reality”.⁸⁴

Mãe Beth mentions that *Exú* “is the one who opens the path, the first (...) the spectrum, the air, those elements which make our voices heard”. Considering that the process of communication is irrevocably a spiritual interaction between commands of nature (“in the African pantheon the *Orixás* represent nature”) just as humanity, she emphasises the political aspect of radio’s commercial and institutional form which intentionally leaves aside alternative and marginal voices:

82 Interview made by the author and Adriano Belisário on November, 2015. Available on Youtube <<https://www.youtube.com/watch?v=FbFmUZU9yb4>>.

83 Henry Louis Gates Jr., “The ‘Blackness of Blackness’: A Critique of the Sign and the Signifying Monkey” in *Critical Inquiry* (vol 9, 1983) pp. 685 – 723, p. 687.

84 Santiago Juan-Navarro, *Archival Reflections: Postmodern Fiction of the Americas (Self-reflexivity, Historical Revisionism, Utopia)* (London: Associated University Presses, 2000) p. 189.

“The spectrum needs to be in our hands so we can reveal ourselves to the world and for the whole world to truly know this culture which is still hidden. *Saravá*, isn’t it? *Axé*”⁸⁵

As an entity with direct contact to everyday life by his sensible appearances in rituals, feelings and the necessity about his permission to communicate with other *Orixás*, Exú plays with the transformative aspect of language by rather figurative than literal means: “as tricksters they are mediators and their mediations are tricks”.⁸⁶ The idea of EMS as a carrier void of inner significance, an inanimate natural resource or a mere physical phenomenon, finds a good epistemic counterpoint in Mãe Beth’s thoughts. Here, the spectrum is apprehended as a complete entity which comprises aesthetics, spirit and language that, as analogous to Exú, is the “interpreter and interpretation itself”,⁸⁷ “the literariness of literary language; (...) the great Signifier”.⁸⁸ In such African-American cosmological and epistemic perspectives, Exú acts as a metonymy of the spectrum as messenger of gods as well as divine/diabolic interpreter, signifying a central spiritual entity for the existence of culture and expression that seeks “in the language of the text, ‘The Work,’ which is (...) the very work (and play) of art itself”.⁸⁹

The process of having a radio is a desirable and fruitful interaction with Exú and its divinity, which stands for the integration of cultural politics with aesthetics: “The schools, the traditional population, the indigenous people, the many collectives got to have radios”.⁹⁰ For Mãe Beth, the political process of concession and sub-location of the spectrum “took out the *Orixás* from the soul of Brazilians” due to the programmed invisibility of marginal cultures at the same time that it enhances the domain of the media by evangelical churches.

The system of radio and TV concessions in Brazil is guided by a strong political element. Despite being unconstitutional, large communication networks operate as an oligopoly, where their regional affiliated broadcasters reproduce the national content and share their editorial line. Furthermore, the growing political relevance of churches linked to neo-Pentecostalism and the attention that these groups give to the power of media make them important players in disputes over the imaginary and subjectivity. For such churches, the forms of African religions are demonic and heretical. Thus, added to the historical and structural prejudice, these modern forms of religiosity represent an objective and subjective threat to the existence of spaces, rituals, ceremonies and beliefs of religions from African origin

85 “O espectro precisa estar nas nossas mão pra que a gente possa se revelar pro mundo e pra que o mundo de fato conheça essa cultura que ainda está escondida. *Saravá*, né? *Axé!*”

86 Henry Louis Gates Jr, ‘The ‘Blackness of Blackness’, *ibid.* p. 687.

87 Henry Louis Gates Jr, ‘The ‘Blackness of Blackness’, *ibid.* p. 704.

88 Henry Louis Gates Jr, ‘The ‘Blackness of Blackness’, *ibid.* p. 689.

89 Henry Louis Gates Jr, ‘The ‘Blackness of Blackness’, *ibid.* p. 705.

90 “As escolas, os povos tradicionais, os índios, os coletivos diversos tem que ter rádio”

These forms of prejudice objectified in the policies of concession and use of broadcasting are also aesthetic battles, where expressions and cosmologies are brought face to face and become objects of epistemological dispute over the origins and destinies of humanity. Here, we find an aesthetic battle between cosmologies connected to social practices and rituals that represent the joy and expressions of such cosmologies, as told by Mãe Beth:

When humanity lacked the drums (tambor), lacked the chant, lacked the dance, *Orumila* saw it in humanity's eyes and asked *Olodumare* to bring the instruments, bring the sound, the rhythm, the swing, the dance and the joy, this is why the Orixá, when it comes, he sings, dances and swings, for this happy bond so the humanity cannot be sad.⁹¹

Therefore, the musical instruments are not industrial goods painted as spiritual magic but features of the deities themselves and gifts against the sadness related to the absence of the *Orixá* and to the ugliness of politics that impedes expressions. The connection to the elemental significance represented by Exú tells us that, in such perspective, making use of the spectrum is to rejoice to be alongside him.

Final Remarks

Anthony Dunne argues that the aesthetic experience of the “connection between the worlds of electromagnetism and spatial inhabitation” is linked “more to the complicated pleasure of literature and film than to sculpture”.⁹² The concepts of dematerialization and juxtaposition are used by Dunne to integrate and reconcile electronics and matter within the realm of aesthetic objects in order to “lead to new aesthetic possibilities for life in an electromagnetic environment”.⁹³ Fostering a “poetic and multilayered coupling of electromagnetic and material elements to produce new levels of cultural complexity”,⁹⁴ his work suggests a “meaningful reflection on inhabitation of a ubiquitous, dematerializing, and intelligent environment”⁹⁵ based on encounters and creations of industrial design aesthetics with the electronic immateriality of media and its impact on everyday life.

91 “Quando a humanidade não tinha o tambor, não tinha o canto, não tinha a dança Orumila viu isso nos olhos da humanidade, e pediu a Olodumare para trazer os instrumentos trazer o som, o ritmo, o bailado a dança e a alegria, por isso que o Orixá quando vinha ele canta ele dança ele baila, por esse pacto de alegria pra que a humanidade não possa ficar triste”. Mãe Beth de Oxum. *AfroTranscendente Websérie*, Cap 04. Available at: <https://www.youtube.com/watch?v=ur42fxP_qpE&t=43s> Accessed in 15/07/2018.

92 Anthony Dunne, *Hertzian Tales: Electronic Products, Aesthetic Experience, and Critical Design* (London: The MIT Press, 2005) p. 148.

93 Anthony Dunne, *Hertzian Tales*, Ibid. p. 101.

94 Anthony Dunne, *Hertzian Tales*, Ibid. p. 121.

95 Anthony Dunne, *Hertzian Tales*, Ibid. p. 147.

This thesis, otherwise, sees the lithic sculptural statues of Meso-America, the metal pointers of Chinese Jade hunters, the lithic energy of waka's and the Iorubá spirituality as more significant “hybrids of radiation and matter” with “new poetic dimensions” which, furthermore, differ conceptually and temporally from the material design of modern electronic “objects”. The interesting nostalgic sense which Dunne celebrates in the materiality of early electronic objects as conceptual products and their “modernist poetry based in truth to materials”⁹⁶ treats electromagnetism from a parameter established after its creation and invention by the ITU. Instead, one should seek the meaning and conceptual alternatives in the result of different compositions to reconcile energy and space, such as it is the case of the above examples of magnetic and energetic usage.

Firstly, I identified understandings of an *aetherial* energy as spatial awareness, affection, oriented action, spirituality and sensuous perception: as a type of aesthetics which is different from the concept elaborated to identify judgement, beauty, symmetry or purely individual subjective feelings. Second, the early examples of Chinese and Olmecs characterize the compass as a materialization and objectification of magnetism (and not the other way around, as magnetism awaiting the compass to come to life) which is understood as a mixed condition belonging to the work of art and spatial awareness without necessary separation between the two. Thirdly, the material aesthetic property of magnetism shared with statues, figurines, spirits, nature and sculptures renders a “mediatic” quality to minerals and energy, indicating that wished poetic coupling, cultural complexity and integrated spatial design which Dunne sees in electronic objects of modern everyday life.

Would the aesthetic expression and the spatial function of the Fat Boys sculptures from Guatemala be possible if it were not for the perception of magnetism in which they were constructed around? By shaping minerals as media “at large”, such cultures had their way of materializing, locating and aestheticizing magnetism at the same time that they demonstrate aspects of its political use and symbolic power. As aesthetic objects and magnetic sculptures used as artefacts for geo-localization, they could not be elaborated without the perception of magnetism as a particular differential signifier related to a material energy, spatial-temporal awareness as well as powerful political messages.

The aesthetic property characterizes itself for uses and significances which combine immateriality, objecthood and cultural meaning. In opposition to a sort of romantic approach towards aesthetics which argues for conceptual and poetic dimensions from dematerialization and

96 Anthony Dunne, *Hertzian Tales*, Ibid. p. 7.

juxtaposition (a syncretic relation), this other approach – magnetised instead of ‘electronic’ – moves, instead, from an energetic order to a dense extensive system. Rather than romantic and modern, it is baroque and primitive: goes from the sensitive to the concrete through materialization and alliances (a composition from *bricolage*). As a counter-colonial perspective, this magnetic materiality appears as a complexity “of alliance before descendance” and “baroque before romantic”, to use Viveiros de Castro’s idea of a non-Western “demonic alliance”.⁹⁷ Such construction appears in Lezama Lima’s idea of the American “Sir baroque”, who “well settled at the centre of his pleasure” built a new relation to the space by founding a baroque landscape which “recovers a more powerful and demonic magnetization”.⁹⁸

The core of the media criticism towards the current distribution and ownership of the radio space is given by questions such as how do one divides, what is the legitimacy and who conceded the power to regulate the aerial space? In this sense, there would be a large portion of humanity which is struck in their social and cultural lives when their own perspective and imaginary about nature is not only obliterated but impeded from thriving, evolve and develop new forms of structuring epistemologies, advancements and evolutions. One of the consequences of the process of disenchantment of the world is precisely the diminishing in ancestral, traditional, magical and spiritual perspectives. As a consequence, it makes the modern arrangement to become a new form of domination based on the myth of an unbiased science and instrumental rationality. As we will see, in regulatory mechanisms for radio waves, the process also followed the form of a particular and historical perception about what occurs with a phenomenon of nature related to wireless communication.

Nonetheless, even in the elaboration of the Western rational vision of what the radio spectrum represents, there are cosmological, spiritual and mystical references. However, it was this lineage that prevailed and developed to become the justification for imperial control over radio waves. The problem of access to these waves, the causes for regulation and the criminalization of communication transmitted without a licence is therefore linked to a type of development of the idea of spectrum that privileges its connection with the economic, political and aesthetic forms of modernity.

97 Eduardo Viveiros de Castro, ‘Filiação Intensiva e Aliança Demoníaca’, *Novos estudos CEBRAP [online]*, (São Paulo, n.77, 2007) pp. 91-126, p. 13 (online version).

98 “a paisagem recupera uma imantação mais poderosa e demoníaca”. José Lezama Lima, *A expressão Americana* (São Paulo: Editora brasiliense, 1988), p. 173.

Chapter 2 – Fragments of Western Spectral Philosophy

Just like magic and alchemy were of great importance for primordial experimental chemistry, Oswaldo Pessoa Jr. argues that “cultural manifestations such as guessing and geomancy” were fundamental for the “rising science” of magnetism. From the fact that such cultural manifestations occurred in an independent manner in three different continents (Europe, Asia and America), one might find that magnetism engendered different epistemic landscapes according to the use, material relation, cultural perception and social formation of the locations from which it was explored.

As demonstrated by Pessoa Júnior, the directional property of lodestone in the form of the compass only reached Europe “a millennium after the existence of its documentation in China”,⁹⁹ where Li Shu-Hua described¹⁰⁰ its use for maritime spatial location and at least 1000 year after its use in Meso-America. He introduces the idea of a “widespread advance” of a rising science as a way of opposing “mature science”. Thus, in the former, cultural manifestations are a central element and conform similar advances, opening the chance for “possible histories” of scientific development. The particular functional uses of magnetic space and force, however, appear and inform different ways of thinking about science, exercising its uses and combining it with other forms of world-views. In the Western tradition, this genesis takes on a particular form.

Lodestone is readily present in nature from the iron ore magnetite (Fe_3O_4), which carries this name from the region of Magnesia, where Thales of Miletus¹⁰¹ realized “the attractive (electrostatic) effect that scrubbing amber exerts on small pieces of any materials”.¹⁰² The first conceptions of Western scientific magnetism and the influence that the Greek philosophy had on it reveal explanations and perceptions of hylozoist type, where life and soul are not combined and integrated in material things but embedded into objects (Thales’ “all things are full of Gods”¹⁰³ as opposed to God is all things, for example). Magnetic forces and energies were also related to the property of elements combined with and explained by sensory feelings and perceived through combinations of physical and physiological, animate and inanimate qualities: “According to Thales (...) lodestone has a soul because it moves iron”.¹⁰⁴ The attractive force of the lodestone was seen as a particular powerful manifestation of a divine animate quality shared by all things.

99 Oswaldo Pessoa Junior, ‘Modelo causal dos primórdios da ciência do magnetismo’, in *Scientiae studia* (São Paulo: Vol.8, n.2, 2010), pp. 195-211, p. 198.

100 Li Shu-hua. ‘Origine de la Boussole II. Aimant et Boussole’, *ibid.* pp. 175-196.

101 “Thales, too, apparently, judging from the anecdotes related of him, conceived soul as a cause of motion, if it be true that he affirmed the lodestone to possess soul, because it attracts iron.” Aristotle, *De Anima*, trans. by, R.D. Hicks (Cambridge: Cambridge University Press, 2015) 405a19.

102 Oswaldo Pessoa Junior, ‘Modelo causal dos primórdios da ciência do magnetismo’, *ibid.* p. 196.

103 Aristotle, *De Anima*, *ibid.* 411a7.

104 Aristotle, *De Anima*, *ibid.* 405a19.

In an approach considered more materialistic and mechanical, Empedocles illustrated magnetic attraction and repulsion from a mechanical perspective, activated by both tendrils and pores and by the action of air in iron and stone. This “effluence” is illustrated by amity and strife that particles present from an atomistic approach. Similarly, Democritus wrote his “Treatise on the magnet” explaining magnetic phenomenon through the property and shape of magnets and iron atoms and its interaction with the void. Lucretious, in his *De Rerum Natura*,¹⁰⁵ understood that every body has pores and that emitted “atoms” interact with sensory organs through the void present in objects and bodies. The attachment and repulsion produced by magnetism would be the result of such interactions. Theories of attraction carried by a vital force and nutrition also served as basis to Galen’s explanation on the interaction between iron and lodestone.¹⁰⁶

Whereas in ancient Greece magnetism was mainly observed through the key of atomist, mechanic and materialist perspectives, the idea of a magnetic space fulfilled by a field or a force which also contained the same properties observed in the relation of iron with stones was less explored. The Western influential investigation which explored magnetic spatial and directional properties was initiated only in the High Middle Ages.

Peter Peregrinus de Maricourt wrote, in 1269, a “Letter on the Magnet”,¹⁰⁷ considered “the first great landmark in the domain of the magnetic philosophy”.¹⁰⁸ A “pioneer of science and leader in the progress of the world”,¹⁰⁹ Peregrinus was an experimental scientist who contributed to the disciplining of magnetism by defining the positions of magnetic poles, hence instructing how to determine the south and north, also showing that the poles attract each other and can revert or neutralize this polarity. William Gilbert (1544-1603) pursued experimental activities on electricity and magnetism.¹¹⁰ He constructed a model of a spherical lodestone demonstrating that magnetized needles were activated by the directions of the sphere. He also discussed orientations, meridians as well as day and night variations of the earth, besides scientifically confirming “the attraction of light bodies to amber that had been rubbed with wool”.¹¹¹ From those experiments, he identified the materials which could and could not be charged, labelling them electric and nonelectric in an

105 Titus Lucretius Carus, *Of the Nature of Things*, trans. by William Ellery Leonard (Project Gutenberg, 2008), Available at: <<http://www.gutenberg.org/files/785/785-h/785-h.htm>>.

106 See: A. C. Mitchell, ‘Chapters in the history of terrestrial magnetism IV: the development of magnetic science in classical antiquity’. In *Terrestrial Magnetism and Atmospheric Electricity* (n.51, 1946) pp. 323-51.

107 Peter Peregrinus of Maricourt, *The letter of Peter Peregrinus on the Magnet - AD 1269*, trans Brother Arnold (New York: McGraw Publishing Company, 1902).

108 Brother Potamian, ‘Introductory notice’, in *The letter of Peter Peregrinus on the Magnet - AD 1269*, *ibid.* p. xi.

109 Brother Potamian, ‘Introductory notice’, *ibid.* pxiii.

110 See: Gad Freudenthal, ‘Theory of Matter and Cosmology in William Gilbert’s *De magnete*’, in *Isis* (vol. 74, no. 1, 1983) pp. 22-37.

111 Joseph F. Keithley, *The history of electrical and magnetic measurements: From 500BC to the 1940* (New York, IEEE Press: 1999) p. 6.

etymological reference to amber (elektron), presupposing a field simultaneously operating the *elektron* and the lodestone's attractive property.

However, the scientific study of magnetism that begins with Thales considers a certain atomist materialism, where matter is reduced to the object (the lodestone, the metal) and not related to its effects and propagation in space. The space of heavenly, universal and divine communication is not connected to the material causes of effects of magnetism, since it belongs to the world of substance, fantasy, sympathy or religious spirit. Before the assumption of one field formed by magnetic properties, the idea of a suspended invisible element with energetic qualities bound to connect the human world with the heavens was thought in different ways.

Along this line, the general spatial infrastructure where the spectrum's composites flow in combination in order to acquire meaning has a unique historical and philosophical existence. Such substantial element and its many functions can be traced back to the philosophical ideas of Soul, Spirit, Aether and Pneuma, which, in turn, are connected to spiritual meanings of energetic forces which connect, instruct and communicate mundane, corporeal and sensible aspects with divine, celestial and perfect forms of the universe. Here, the mediatic aspect of the spectrum initiates its significance which will inform the epistemic construction carried out by the Western thought up to the present day.

Although there is this communicative and connective relationship between spirit and matter, in general, in the Western tradition, matter or body is embedded by substance, soul and spirit. In this sense, there is a separation and a different type of power – omnipotent, regulator, conditioner and directive – that acts on the other spheres of worldly life, including its materiality and spirituality. The synthesis of this methodological and cosmological confusion is given by the new science of the seventeenth century and reformulated in the scientific and technical application of radio waves that acts as an ideology and epistemology in colonialism and capitalism.

Pneuma's communication

Stoic aesthetics are known to consider beauty as originating from symmetry, being that the beauty of the body and the beauty of the soul are contained in the same interactive whole. Related to the senses, stoic's *aesthesis* holds analogies with sympathy, co-habitation and communication between soul and body. As pointed to both form and quality which engender a sympathetic coordination between object and subject in a universal and cosmological sense, stoic aesthetics can be considered from the point of view of proportion but also from purpose and functionality.

This stoic central idea of *pneuma*, translated into Latin as ignis, aer or spiritus, holds similarities to aerial and airy functions such as respiration, breath and blow, an idea of oscillation, that, like the physical spectrum, expands and exhales in every spatial direction, propagating as a substance in a symmetric and sympathetic mode. *Pneuma* is the ultimate layer in which soul, physique, and intelligence operate creations associated with the sense organs of the body.¹¹² The animated body of *pneuma* is understandable in correspondence and relation with human senses.

The result of this correspondence operated by *pneuma* in rational animals is “presentation” (*phantasia*) which reveals a set regarding the exchanges of sensory elements as they are captured by the mind and forwarded into the senses. As qualities awakened by *pneuma*, presentation, imagination and fantasy are parts of the bodies’ communicational function which in turn, also defines them. Thus, information conduction is crucial to understand the function of *pneuma* in its relation to cognition: “Pneuma, by its nature, has a simultaneous movement inward and outward which constitutes its inherent ‘tensility.’ (...) in its outward motion it gives [bodies] the qualities that they have, and in its inward motion makes them unified objects”.¹¹³

Analogies with the characteristics of the EMS can be observed by *pneuma*’s relationship with corporeal energetic sensations such as heat and cold, the functional capability to unite (inwards) and to influence (outwards), its pervasiveness, ubiquity and the property of diversely affect multiple objects and subjects, rendering them qualities and sensible meanings. Such as the notion of *pneuma*, the spectrum also prolongs (transmits, emanates, flows) into aspects of *phantasia*: meanings, languages and symbols emitted by its capability of carrying information. In this sense, the spectrum (as a *pneuma*) might appear as that primordial substance (it is here since the early days of the universe), a present state of the act (temporal and spatial) but also as that attributed and manifested effect which coordinates as well as bridges the bodies’ linguistic layers with a natural existence. In this epistemic frame, the aesthetic property of *pneuma*, as the present spectrum, binds its moving connective radiant form with the functionality of the senses, ultimately qualifying body and objects.

In the stoic sense, therefore, aesthetics must be faced as a nemesis of identity, in which the relations of autonomous functioning, unique identification, pure equality and self-semblance have a prior aspect than that which calls for an integrated form of interaction, expression and communication directed to both form and function.

112 “In the Stoic system *pneuma* and vital heat no longer need to borrow their divine quality from the aether. Both of them are now substantially connected with the fire (...), sharing its divine status, and both are cosmic as well as psychic principles.” Friedrich Solmsen, ‘The Vital Heat, the Inborn *Pneuma* and the Aether’, in *The Journal of Hellenic Studies* (vol.77, Part 1, 1957), p. 122.

113 Stanford Encyclopedia of Philosophy. ‘Stoicism’. Available at: <<https://plato.stanford.edu/entries/stoicism/>>.

The Perfect Soul

Nowadays, the radio spectrum is crucial for social life. In many ways, it organizes society, public opinion, technological development, interpersonal and political relations. The political domination over it determines the messages that are more or less disseminated by the media just as its physical constitution is the basis by which wireless technologies evolve and present industrial novelties. Thus, the spectrum has an ordering agency in modern economics and politics. Wireless technology is therefore a “soul” that shapes social relations and seeks to organize society from the point of view of those who control its universe of possibilities. This conception of the spectrum is heir to a vision that divides a divine and perfect entity elaborated by an ordering superior force from the sensitive and disorganized universe of the sensitive world. This Western “soul” of radio finds an inheritance in Plato's idealism.

In Plato's “Timaeus”, the four sublunary material elements were shapeless, disordered, mixed and in motion inside an unbalanced substance. The demiurge added a soul to the world in order to organize the elements according to harmony, interaction and proportion, so they could communicate and balance themselves under a greater purpose. The “suitable and natural” form of the globe, “without legs and without feet”,¹¹⁴ was the perfect shape to maintain His creation:

Such was the whole plan of the eternal God about the god that was to be, to whom for this reason he gave a body, smooth and even, having a surface in every direction equidistant from the centre, a body entire and perfect, and formed out of perfect bodies. And in the centre he put the soul, which he diffused throughout the body, making it also to be the exterior environment of it; and he made the universe a circle moving in a circle, one and solitary, yet by reason of its excellence able to converse with itself, and needing no other friendship or acquaintance. Having these purposes in view he created the world a blessed god.¹¹⁵

The soul of the universe, put inside the globe, acted like a radiating omnidirectional antenna which expands in symmetrical form. The soul's substance, with its inner proportional form and properties, reaches the extremities as well as the surfaces hence it envelops the sensible world as the “shell of steel” (Weber's *Stahlhartes Gehäuse*) of modern rationality covering the ascetic. It then becomes eternal and intelligible by the intellectual object, which understands the language, logic, rules and methods of God, inherently and naturally based in mathematically measured symmetry, proportion, and perfect harmony.¹¹⁶ Rational life starts when the soul – as forms in movement and

114 Since Aristotle mentioned the “limbs” as primary receptive for the senses, here we see the globe and the perfect form of the circle as representing the “higher” world, that of the intellect, as opposed to a sensible one.

115 Plato, *Timaeus*, trans. by Benjamin Jowett. (electronic version). Available at: <http://classics.mit.edu/Plato/timaeus.html> > Accessed: 08/2018.

116 Perfection and harmony of the spheric form is already present in the Pythagorean thought, which believed in the centrality of numbers on the universe formation and constitution. Besides a belief in numeric forms, they stated that everything that exists could be translated into numbers, thus, raising abstract proportionality as a central

movements of forms – defined, classified and divided according to pre-established proportion by God’s logic, rotates over and above the body. However, the chaotic movements of animals and unstable conditions of materiality generated “sensations” is defined as:

the affections produced by external contact [which] caused (...) tumult – when the body of anyone met and came into collision with some external fire, or with the solid earth or the gliding waters, or was caught in the tempest borne on the air, and the motions produced by any of these impulses were carried through the body to the soul.¹¹⁷

The separations present in such dualities (order – disorder; intellect – sensation), forces one aspect to be over and above the other. Accordingly, it reflects different values over the demiurge’s perfect form and its changeless intellectually intelligible qualities against the tumults, transformations and conflictive perspectives expressed by movements, stories and sensations from the physical world. The soul, then, moves to the extremity and consequently engulfs the shapelessness disorder of the materials in motion. Here, the soul is an ordered principle guided by intellectual rules which should fix the tensions caused by material “sensations”.

The platonic idealistic intellect seems to be conceptually close to the present assumed constitution of the EMS: an immutable given ruled by the masters of its language and destined to ordinate the earthly chaos. The current view about the EMS as an unquestionable harmony deciphered and attainable by technical language is similar to the conceptual role of the spirit as divine intellectual perfection. Destined to halt the disturbance of indeterminacy, both the soul and the current control of the EMS struggle against the diabolic sensations caused by the stories from the material world.

relationship which construct as well as explain what exists. Therefore, numbers could reveal a harmonic form which is related to beauty and the divine. This harmony is also thought to be an interconnection between mathematics and music and their relation to the cosmos, since music affects the body and it is constituted by numeral relation, just as the study of astronomy. The perfection of intercommunication between the universe and humans was thought to be outspoken assured by numeric operations and its capacity to be felt by the ear: “The cult leader Pythagoras is reputed to have been the first person to imagine a mythical acoustical cosmos of the music of the spheres”, writes Douglas Kahn reminding of the perfection of both music and the symmetry of the sphere considered by Pythagoreans. Douglas Kahn, *Earth Sound Earth Signal. Energies and Earth Magnitude in the Arts* (Los Angeles: University of California Press, 2013), p. 3.

117 Plato. *Timaeus*. *ibid*.

The Material Aether

However, Aristotle questions the presence of the soul in elements and the partiality of its existence: if the soul is present in air, breath, living beings such as it is in water or fire, it should be understood through the composition of the elements and of itself. What characterizes the soul is not its integrity, but its material combination and perceptive functions, capacities and attributes.

The importance of Aristotle for the formulation of the argument contained in this thesis is that his notion of the aether influenced physics until the nineteenth century and was constantly reminded as the material phenomenon which represented the substance in which object in the cosmos moves. As the first philosophical perspective which combines materialism and divine features, this perception was present in the science of the sixteenth century, when the study of optics designated a phenomenon related to the motion of light. The aether was fundamental for the study of the electromagnetic spectrum, for it is known the electromagnetic waves are able to travel not only through the air, but also in the vacuum. Thus, such substance should be different from the one present in the atmosphere and encompass higher levels and functions. Another feature that Aristotle's aether presents is the combined property between aspects between sensations and the matter which it contains. As we will see, the notion of aether will also be important for Hegel's formulation of the scientific spirit of the nineteenth century, which, albeit related to Aristotle, has more to deal with the idealistic soul of Plato.

Whereas in Plato the soul is essentially different from the physical sensations and it is allocated in the body as its corporeal *vehicula*,¹¹⁸ Aristotle interprets that the transmission of the soul's qualities are tied to three philosophical elements which have to do with immaterial, vital and spiritual existence related to, according to Friedrich Solmsen, the very physical substance of semen:¹¹⁹ vital heat (*thermo*), *pneuma* and the *aether*. The *thermo* is a necessary active condition present in blood and sperm related to a certain temperature which must exist in order to nurture as well as generate reproduction. *Pneuma* refers to the spirit as "the terrestrial counterpart of the

118 "Now we perceive lesser symmetries or proportions and reason about them, but of the highest and greatest we take no heed; for there is no proportion or disproportion more productive of health and disease, and virtue and vice, than that between soul and body. This however we do not perceive, nor do we reflect that when a weak or small frame is the vehicle of a great and mighty soul, or conversely, when a little soul is encased in a large body, then the whole animal is not fair, for it lacks the most important of all symmetries; but the due proportion of mind and body is the fairest and loveliest of all sights to him who has the seeing eye. (...) The human soul differs from the soul of the world in this respect, that it is enveloped and finds its expression in matter, whereas the soul of the world is not only enveloped or diffused in matter, but is the element in which matter moves. The breath of man is within him, but the air or aether of heaven is the element which surrounds him and all things." Plato, *Timaeus*, *ibid*.

119 "Semen, then, is a compound of spirit (pneuma) and water, and the former is hot air (aerh)" Aristotle. *On the Generation of Animal. Book II*, trans. by Arthur Platt (Adelaide: eBooks@Adelaide, 2004.). Available at: <<https://archive.org/details/generationofanim00arisuoft/page/n0>>, Accessed on 29/09/2018.

celestial ‘quintessence’, *aither*, the divine constituent of the heavenly spheres and of the stars”,¹²⁰ being the only medium capable to transport the quality of the soul. The “higher function” of *pneuma* is responsible for physical functions and sensations and, being analogous to the aether, it “substantiates, and gives concrete form to (...) every soul [which] appears to be connected with a body (...) ‘more divine’ than the familiar elements”.¹²¹ Aristotle binds “in poetry rather than in technical discourse”, a physiological, spiritual and material connection which moves from the aether to the reproduction of bodies: “With the aether, too, the soul retains or even strengthens its connection” with life and perception, for outside its connective function, “none of the common four elements can be regarded as sublime enough”.¹²²

Aristotle presents the aether as an element which “runs always for an eternity of time” and “is eternal and not subject to increase or diminution, but unaging and unalterable and unmodified”.¹²³ As a divine, material and natural body, the aether is the quintessence of the perception in regard to the relation between animated sensible soul and inert material body, for if “there is, as there certainly is, anything divine (...) about the primary bodily substance (...) The mere evidence of the senses is enough to convince us of this”.¹²⁴ Instead, and besides being eternal and unchanging, Aristotle views the aether effects and function as a sensitive body which also “possesses life in the basic sense that it brings about nutrition, growth, and decrease, under the guidance of the soul principle”.¹²⁵ Although located in “higher” spatial and spiritual regions, the aether had a material natural form as well as properties which might be related and interfere with the soul’s formation: “Aristotle teaches that every kind of soul is connected with an element ‘different from and more divine than’ the four sublunary”.¹²⁶

In his sense-centred connection between the body and the heavenly, the soul appears as a qualitative combination form which is carried by divine and poetic (albeit material and natural) elements which have properties and a form that moves affectedly, unstoppably, constantly and ubiquitously. As a sublime, divine and higher element, the aether connects to its human counterpart (the *pneuma*) and proceeds to the effect of the body warmth, all related by “a particular and a material thing (...) composed not of a part but of the whole of matter (...) because all the matter is

120 Aristotle, *On the Generation of Animal*, *ibid.*

121 Friedrich Solmsen. ‘The Vital Heat, the Inborn Pneuma and the Aether’, *ibid.* p. 120.

122 Friedrich Solmsen. ‘The Vital Heat, the Inborn Pneuma and the Aether’, *ibid.* p. 123.

123 Aristotle, *On the Heavens*, trans. by J. L. Stocks (Book1, part 3). Available at:

<<http://classics.mit.edu//Aristotle/heavens.html>>

124 Aristotle. *On the Heavens*. *ibid.*

125 A. P. Bos, *The Soul and Its Instrumental Body: A Reinterpretation of Aristotle’s philosophy of living nature* (Boston: Brill, 2003), p. 82.

126 Friedrich Solmsen, ‘The Vital Heat, the Inborn Pneuma and the Aether’, in *The Journal of Hellenic Studies*, (vol.77, Part 1, 1957) pp. 119-123, p. 120.

already included in this [universe] (...) only to prove that it is composed of all natural perceptible body.”¹²⁷ When holding the property of connecting material and spiritual, the aether, as that notion which was later an early name for the spectrum, appears for Aristotle as a composition. Although scientifically discredited, the aether never ceased to be used as something related to ambivalent meanings.

The aether, described even by Hertz “as a medium (...) not only through which, but by which, forces of attraction and repulsion, seemingly acting at a distance, are transmitted”,¹²⁸ was disregarded as observable reality first by the famous Michelson-Morley experiment¹²⁹ and finally discredited in the twentieth century by Einstein’s special theory of relativity.

The Spiritual Light

The spectrum’s Western historical relation amongst sensible perception, spiritual dimension and rational understanding can be particularly observed in the explorations of the properties and effects of light, which has been carrying the tradition related to the quality of divine illumination more like an intellectual substance than as a physical phenomenon. This sort of transcendent radiation had the property of supreme domination by actively communicating between the spiritual and the human world, imposing the perfect order of the “spiritual light” as

an Originating Beam and an Overflowing Radiance, illuminating (...) every Mind above the world, around it, or within it, and renewing all its spiritual powers, embracing them all by Its transcendent elevation (...) and unites together those that are being illuminated, and perfects them and converts them (...) from their manifold false opinions and unites their different perception, or rather fancy, into one true, pure and coherent knowledge, and fills them with one unifying light¹³⁰

Later on, the medieval philosophy of Saint Thomas Aquinas separated light in different instances in order to retain its role of religious substantial power and abide to the Aristotelian conception and explanation to the natural phenomenon: *Lux, Lumen, Radius and Splendor*. Light appears respectively as a quality, a medium, a motion and a reflection, in different modes and agencies of its natural activities. As a quality per se, light was explained with the assistance of the Aristotelian scheme, for whom vision perceives what is real and characterizes the definition of true

127 Aristotle. *On the Heavens*. *ibid.*

128 Heinrich Hertz, *Electric waves; being researches on the propagation of electric action with finite velocity through space*, trans. by D. E. Jones, p.xii. Available at <<http://ebooks.library.cornell.edu/cgi/t/text/text-idx?c=cdl;idno=cdl334>>

129 Albert A. Michelson & Edward W. Morley, ‘On the Relative Motion of the Earth and the Luminiferous Ether’ in *American Journal of Science* (vol.34, 1887) pp. 333–345.

130 Pseudo-Dionysius, *The Divine Names*, quoted from Ofer Gal and Raz Chen-Morris, *Baroque Science* (London: University of Chicago Press, 2013). p. 60.

knowledge by the materialistic sensitive ‘touch’ of the continuum medium into the eye. Thus, light is seen with an ontological status and state which explained the divine creation of the world as it directly appears to us nevertheless it calls for contemplation, with little physical meaning outside its enigmatic sensible ways of being and presenting itself.

The idea of light, as an illuminating revelation into the divine order and a significant agent to reveal the truth of matter and form as created by God (subject to meditation and contemplation of the divine), with the coming of the renaissance should also contain an explanation through mathematical and geometrical examination of its nature. If material forms can be measured, the mysteries pertaining to the geometric optics, perspective, reflection, gaze, visual field, emanation and radiation of light should be deciphered in order to “observe the natural world directly; not as an enigma but as a clear manifestation of divine truth” in which it would “allow the human contemplator to gaze through their allegorical or spiritual appearance at their fully materialized form”.¹³¹ To that end, geometric reason and technical instruments were applied to the studies to explain the material measurement and mysteries about the imperfect judgement of senses and perceptions.

Up to the middle ages the phenomenon of light was seen as a way of relating the worldly and the divine. The transmission of light was seen as something which transcended and transformed the interactions of the senses with God. Deciphering and cataloguing the light was a manner of organizing the middle age’s aesthetics in terms of a spiritual import which stroke the eyes or was activated by it. As a manner to re-enchant objects through the connection between material and immaterial, “visual perception was not uncoupled from the other senses” and “light and colour were never far away from the aesthetics of music and harmony”.¹³² In the middle ages the initial perception about the similarity of behaviour and function of the waves (light and sound) appear as linked to the perception of the divine. In this sense, the spectrum as elaborated by Newtonian science carries the heritage of the visual and sacred property of light. The manipulation of this phenomenon is thus related to the taming of senses, what will be a fundamental aspect defended by this thesis, in which the power over the radio waves is an aesthetic control.

A scientific pioneer in the study of light’s relation to perception was Persian scientist, Ibn al-Haytham, who, during the decade of the year 1010, wrote “The book of Optics”, a fundamental work which is said to have had an effect on Newton’s formulations.¹³³ There, he “decisively

131 Ofer Gal and Raz Chen-Morris, *Baroque Science* (London: University of Chicago Press, 2013). p. 67-68.

132 David L. Martin, *Curious visions of modernity: Enchantment, magic and the sacred* (London: The MIT Press, 2011), p. 198.

133 See: George Ghevarughese Joseph, ‘Foundations of Eurocentrism in Mathematics’, in *Race and Class XXVIII*, (1987); Abdelghani Tbakhi, & Samir S. Amrir, ‘Ibn Al-Haytham: Father of Modern Optics’ in *Ann Saudi Med*, (vol.

distinguished the study of optics (both physical and geometric) from that of visual perception”,¹³⁴ exploring the distinctiveness between what is physically explained and what it is perceived by the senses. For him, “perception”¹³⁵ is the influence of the physical phenomena on gaze and vision¹³⁶ dependent on distance, position, solidity, shape, beauty, ugliness as well as other concrete factors and values. Albeit different from the physical explanation of light, such “perceptions” are responsible for the blending of sensation and cognition: “Nothing of what is visible, apart from light and colour, can be perceived by pure sensation, but only by discernment, inference and recognition, in addition to sensation”.¹³⁷

The Baroque Synthesis

In relation to the behaviour of the electromagnetic field, the word “spectrum” was first recorded in English by the physicist Isaac Newton to illustrate the extension of the “oblong form” of the colours produced by the refraction of light rays caused by a prism.¹³⁸ The name Spectrum is born from the curiosity over the “extravagant” form of an appearance in motion: the light rays “were terminated at the sides with straight lines, but at the ends, the decay of light was so gradual, that it was difficult to determine justly, what was their figure; yet they seemed semicircular”.¹³⁹ Thus, the behaviour of light rays and its material form becomes a curious “spectrum” which unfold into space. Today it is accepted that light refers to the range of the electromagnetic radiation that humans are able to see.

27[6], 2007). pp. 464-467.

134 H. Salih, M. Al-Amri and M. El Gomati. ‘The miracle of light’, in *Natural Sciences Quarterly Newsletter* (vol. 3, n. 4, 2005), p. 4.

135 See: Al Haytham, *The Optics of Ibn Al-Haytham, Books I – III*, trans. by A. I. Sabra (London: The warburg institute, 1989) pp. 126 – 207. [Book 2].

136 “Our subject is obscure and the way leading to knowledge of its nature difficult; moreover, our inquiry requires a combination of the natural and the mathematical sciences. It is dependent on the natural sciences because vision is one of the senses and these belong to natural things. It is dependent on the mathematical sciences because sight perceives shape, position, magnitude, movement and rest, in addition to its being characterized by straight lines; and since it is the mathematical sciences that investigate these things, the inquiry into our subject truly combines the natural and the mathematical sciences.” Ibn al-Haytham. *The Optics of Ibn Al-Haytham*, *ibid.* p. 4.

137 A. I. Sabra, *Optics, Astronomy and Logic Studies in Arabic Science and Philosophy* (Brookfield, Variorum, 1994) p. 133.

138 “I became surprised to see [the sun rays refracted by a prism] in an oblong form; which, according to the received laws of Refraction, I expected should have been circular. (...) Comparing the length of this coloured Spectrum with its breadth, I found it about five times greater; a disproportion so extravagant, that it excited me to a more than ordinary curiosity of examining, from whence it might proceed.” Isaac Newton, ‘A Letter of Mr. Isaac Newton, Professor of the Mathematicks in the University of Cambridge Containing His New Theory about Light and Colors’ in *Philosophical Transaction of Royal Society* (Vol 6, n.69-80, 1671). p. I. Available at: <http://www.newtonproject.ox.ac.uk/view/texts/normalized/NATP00006> Accessed: 14/08/2018.

139 Isaac Newton. *Theory about Light and Colors*, *ibid.* p. 3076 (electronic version).

For Newton, light is both body and substance and the “light rays” (the movable portion of the spectrum form) have a property of being a “subject” of light at the same time that it is what “sustains” it.¹⁴⁰ As proper to light rays, colours are then qualities of light and qualifiers of what we see, affecting objects that acquire the meaning delivered by the beam. It is light’s “sensible qualities” which allow Newton to perceive the spectrum as a carrier of a signifier. The perception or sight’s sensible impression is not on the object activated by the light’s movement but before, on the rays’ “entire and immediate” property. Also, it is not the object that activates the spectrum and makes it vivid and perceptible, but contrarily, it is the spectrum’s inner physical constitution that delivers meaning to its reach. The materiality of the spectrum (light particles) determines the perspective of the material object.

Thomas Young associated Newton’s spectrum with “undulatory” movements or waves forms, which led him to explain that “fringes of colours are produced by the interference of two portions of light”¹⁴¹ by experimentally demonstrating that interference is a physical property of the spectrum caused by the movements of wave forms:

since we know that sound diverges in concentric superficies, and that musical sounds consist of opposite qualities, capable of neutralising each other, and succeeding at certain equal intervals, which are different according to the difference of the note, we are fully authorised to conclude, that there must be some strong resemblance between the nature of sound and that of light.¹⁴²

Moreover, he relates the undulatory movements and effects of light with those seen in water, attesting the material aspect of the “mutual interference” of wave motion both as natural feature and as a result created by the moving undulatory form: “These combinations resemble the effects of the waves of water in similar circumstances (...) and they may be illustrated by drawing two curved lines representing the motions which constitute the sounds”.¹⁴³ Such interference, is not only a functioning property of waves, but, furthermore, it results into something new. Young added to Newton’s spectrum the amplitude, frequency and breadth proper to undulatory motions similar to mechanic waves and demonstrated that interference is a natural result of such behaviour which reveals a new formative combination.

140 “Colours are the *qualities* of Light, having its Rays for their entire and immediate subject, how can we think those Rays *qualities* also, unless one quality may be the subject of and sustain another; which in effect is to call it *substance*. We should not know Bodies for substances, were it not for their sensible qualities”. Isaac Newton, *Theory about Light and Colors*, *ibid.* p. 3085 (electronic version).

141 Thomas Young, ‘The Bakerian Lecture. Experiments and calculations relative to physical optics’, in *Philosophical Transactions of the Royal Society of London* (vol.94, 1804), pp. 1-16, p. 1.

142 Thomas Young, *The Bakerian Lecture*, *ibid.* p12.

143 Thomas Young, *A course of lectures on natural philosophy and the mechanical arts* (London: William Savage, Bedford Bury, 1807) p. 390.

By drawing a correlation between the analogous behaviour of waves of light, water and sound, Young questioned Newton's idea of light as refracted and diffracted particles agitated and carried by a "luminiferous aether". He highlighted the fact that Newton "considered indeed the operation of an ethereal medium as absolutely necessary to the production of the most remarkable effects of light, but he denied that the motions about such a medium actually constituted light".¹⁴⁴ Considering the waves as a composite of its own carrier, Young appears to suggest that the medium is less important than the inner properties, movements and qualities of light itself withal that movements are constitutive elements of such composition:

It is simplest to consider the ethereal medium which pervades any transparent substance, together with the material atoms of the substance, as constituting together a compound medium (...) analogous to an infinitely elastic fluid, in which undulations of all kinds move with equal velocity, and material transparent substances, on the contrary, as resembling those fluids, in which we see the large waves advance beyond the smaller.¹⁴⁵

From an analogy with the behaviour of mechanical waves, Young discovered that interference is proper to light waves and that the spectrum was a result of their motion. Thus, the particular movement and wave form compose a thing in itself that is confused with the medium and the objects it affects:

Light, therefore, must be every where present, whether we suppose it to consist of separate projected corpuscles, or to be an affection of a highly elastic ether, pervading the universe in a state so rare, that although it constitutes a continuous medium, it suffers all bodies to move through it without sensible resistance, and is admitted even into their pores with perfect freedom.¹⁴⁶

The confirmation of wave motion as a formative behaviour of light led him to suppose "immaterial" causes or substances related to the explanation of "attraction", "electrical fluid", "the general medium of light and heat" and "the semimaterial existences which produce the phenomena of electricity and magnetism, (...) or a universal ether". Admitting the possibility of "spiritual worlds unseen forever by human eyes", he does not see "any reason to suppose that even the presence of matter (...) necessarily excludes these existences from it."¹⁴⁷ Light appears both as a composition of combined fragments and as element for the curiosity over an existence outside matter.

The baptism of the spectrum by Newton and the polyvalent aspect of the concept was inherited by the trans-epistemic explorations of its form, properties, qualities and functions. The

144 Thomas Young, *A course of lectures on natural philosophy and the mechanical arts*, *ibid.* p. 477.

145 Thomas Young, *A course of lectures on natural philosophy and the mechanical arts*, *ibid.* p. 463.

146 Thomas Young, *A course of lectures on natural philosophy and the mechanical arts*, *ibid.* p. 485.

147 Thomas Young, *A course of lectures on natural philosophy and the mechanical arts*, *ibid.* p. 610.

assumptions over its essence changed through time. The many intellectual incursions over the mysterious substance remained an influential idea to the science of the sixteenth and seventeenth century, provoking an instability in the form by which the epoch interpreted the role of the – by then, unknown – electromagnetic spectrum.

In the baroque science the idea that technical instruments may alter, deceive and qualitatively transform the experience of the senses, led to the assumption that tools which interact with perception could simulate the presence of supra-natural imagos. Early experiments with instruments of light manipulation already expressed the wonders of image creation by “reciprocal strokes of reflexion” that “may seem not to be the repercussions of the Glasses, but Spirits of vain Phantasms (...) outwardly, hanging in the air”.¹⁴⁸ Such instrumental experiments used by “optical magicians” played with the existence of a pure and real image in contrast to a distorted and artificial perception, feeding the debate on the relation between physiology, anatomy and natural science with perception, theology and the arts.

The dilemmas and anxieties of that scientific revolution initiated in the late sixteenth century are called by Ofer Gal and Raz Chen-Morris a “Baroque phenomenon”.¹⁴⁹ It was precisely the “extravagant difference between the physical objects of optics (monochromatic rays) and the perceived object of vision (white light)” which characterizes the “baroque science” of Kepler, Newton, Galileo and Descartes. The curiosity to decipher the differences between the natural and the artificial, the direct and the mediated, comes from a baroque discomfort with the paradox of light’s behaviour as, on one hand spirit and matter and on the other, as altered perception revealed by instrumental means. The scientific use of mediation instruments together with the appliance of mathematics to reveal the natural world led to a confused assemblage of imagination which would nurture the body of science of the era with Baroque’s “obsession with details”, “sensuality”, “distortions” and “enthrallment with the passions”.¹⁵⁰ The scientific demonstrations, mirrors, spectacles, lens, telescopes, microscopes and magnifiers were seen as forms to justify the reason to polemicize on the relation between the visible reality and the divine meaning, since the encounter of the spirit with knowledge could be revealed by artificial means and signified by numeric measures.

The pure motion of light’s property and the aversion to the void – two baroque epistemic creations related to the spectrum’s function – symbolized a “causal yet mathematical; fantastic yet well-measured; mediated yet reliable”¹⁵¹ knowledge produced by the imagination responding to

148 Ofer Gal and Raz Chen-Morris, *Baroque Science* (London: University of Chicago Press, 2013), p. 26.

149 Ofer Gal and Raz Chen-Morris, *Baroque Science* (London: University of Chicago Press, 2013).

150 Ofer Gal and Raz Chen-Morris, *Baroque Science*, *ibid.* p. 12.

151 Ofer Gal and Raz Chen-Morris, *Baroque Science*, *ibid.* p. 252.

both the physical phenomena and God's creation. Descartes' idea of Aether (fig.2) as an element which explained the mechanical movements of celestial bodies and as evidence against the theory of empty space appears as "an all-encompassing, all-pervasive substance, responsible for the transmissions of light from the sun to the earth, for optical pressure and for the gravitational stability of the planets".¹⁵² Echoing Aristotle's description of the universe as *plenum*,¹⁵³ the aether rejects the idea of the void, arguing that universe is formed by matter as constituent of the space "extension" and formative of its continuous shape where movement can exist.¹⁵⁴

Fig.2: Illustration of Renati Descartes' vortex theory in his *Principia Philosophiae*, Amsterdam, 1644, p. 92. Image provided by the History of Science Collections, University of Oklahoma Libraries (<<https://digital.libraries.ou.edu/homescience.php>>).

152 Edmundo Balsemão Pires, *Phenomenology as the justification for the self-reference of the Absolute, in Still reading Hegel 200 years after the phenomenology of Spirit*. (Coimbra: Imprensa da Universidade de Coimbra, 2009).

153 Scots-Irish mathematical physicist and engineer William Thomson, known as Baron Kelvin, would retrieve the notion of plenum by illustrating Hertz's demonstration of the existence of electromagnetic waves as "one ether for light, heat, electricity, magnetism". Lord Kelvin, 'Preface to Heinrich Hertz' in *Electric waves; being researches on the propagation of electric action with finite velocity through space*, trans. by D. E. Jones, p. xv. Available at: <<http://ebooks.library.cornell.edu/cgi/t/text/text-idx?c=cdl;idno=cdl334>>

154 See: Aristotle. *Physics* (Book1, part5; Book4, part8). Available at: <<http://classics.mit.edu/Aristotle/physics.html>>

The perception of the electromagnetic spectrum, being in the form of light, *aetherial* plenum, spiritual soul, immediate substance or universe's natural constituent was central for the constitution of this "Baroque Science" as an aesthetic experience, spiritual justification and as a field for philosophical and natural inquiry. The epistemic history of the electromagnetic phenomena, solidified by a baroque science and inaugurated by its curiosity, is thus, for this thesis, an important element for the control of an aesthetic of the spectrum which today determines its conceptual political role.

Spanish historian José Maravall delimits the Spanish baroque from 1600 to 1680, when, instead of being a style, represents a historical structure in which "the utilization of rational and mechanical elements that scientific thought and modern technology allocate for accomplishing magical, extrarational objectives"¹⁵⁵ was formulated with calculation. In addition, such baroque epoch reflects the confrontation between the force to maintain the system of monarchic absolutism and the birth of a mass society as a force. As an audience for cultural productions pertaining to a rising bourgeoisie (as not yet as a conscious political class) the appearance of this subject helps to disseminate a new culture that questioned the stratification belonging to the ruling order, hence conceiving new types of social relation. This impassioned rising class, Maravall argues, sought out the baroque "orgiastic excess" in its "taste for grand ceremonies, an extrarational admiration for the sublime, and an attraction toward chance that disrupted all rational order".¹⁵⁶

The baroque science's abundant ability to imagine communicative connections and spark infrastructural tensions between material and extra-corporeal systems lost space in modern science, romantic aesthetics and industrial machines, where it took the form of a stable physical phenomenon. Away from the interferences, distortions and paradoxes which characterized the debate on optics and light, the modern will to realize a 'pure' communication led to the conceptual justification for a techno-scientific manner to communicate without the aid of nature and spirits, represented by a fully functional "modern wireless telegraphy [which] deploys the cool voice of the New Objectivity".¹⁵⁷ The romantic scarce harmonies of optimal technical communication has replaced the abundant tensions of the elliptical Keplerian "baroque science" and its disruptive interfering curiosity into the "dichotomy (...) between perception 'face to face' and 'looking through a glass darkly'":

155 José Antonio Maravall, *Culture of the Baroque: Analysis of a historical structure* (Mineapolis: University of Minnessota Press, 1986), p. 269, n.12.

156 José Antonio Maravall, *Culture of the Baroque*, *ibid.* p. 63.

157 Erik Christopher Born, *Sparks to Signals: Literature, Science, and Wireless Technology, 1800–1930* (PhD Thesis. Berkeley: University of California, 2016), p. 90.

The Baroque tension between practical acknowledgement of irreducible complexity and the insistent public avowal of discoverable, fundamental simplicity is a cultural phenomenon of utmost importance; a crucial aspect of the legacy of early modern science that its modern successor has never acknowledged, let alone reflected on.¹⁵⁸

Final Remarks

The semi-material ghostly sense of the word spectrum is recorded in the *Totius Latinitatis* lexicon, firstly written in 1771 by Egidio Forcellini and Jacobo Facciolati. Here, the term spectrum is associated with “immagine, ghost, visione, simulacrum, idolum, phantasm, imago”,¹⁵⁹ demonstrating that the significance, attributes, behaviour and function related to the rising scientific phenomenon was also epistemically and semantically confused with supernatural phenomena.

The consolidation of this particular view on the electromagnetic phenomenon is linked to a genesis of thinking about a medium related to the essence of the air breathed by the deities as well as the mythologies that arose around an invisible element other than air. Pneuma, plenum, soul, spirit and the aether have in common the idea of a quintessential substance that helps to understand and picture phenomena such as movement, the gravity of bodies, light, location and in general manner, the idea of the constitution of the space and time. The quintessential nature of this element is linked to divine perfection and the purity of souls and spirit. It mostly refers to a divine substance which fixes the instability of sensation (less, though in Aristotle’s aether) and imposes a certain perfect order to the universe of supra-natural interaction with the world.

The emergence of scientific objects and instruments related to optics and the baroque science provided to the conception of the aether a reinvention and a style in terms of a sensitive perception when translating it as a spectrum linked to properties of temperature, sound and images. As a fluid, blurry optic presence, this new spectrum is able to hold connections with another rising science of the eighteenth century, an *epistêmê aïsthetikê*, created as framework of the knowledge as concerning sensation and imagination; in the words of Baumgarten, “the science of perception, or aesthetic”.¹⁶⁰

As an object of philosophy, the substance identified with the aether presupposed differentiations between its essence and its function, with the separation between matter and spirit engendering a superior type of power of the later. In general, matter was embedded with divine and heavenly power from the soul, lux, pneuma or the spirit. This power, regulator, omnipotent and

158 Ofer Gal and Raz Chen-Morris. *Baroque Science*, *ibid.* p. 178 – 179.

159 Aegidii Forcellini & Jacobi Facciolati (eds), *Totius Latinitatis Lexicon* (Tomo IV, 1845), p. 230.

160 Alexander Gottlieb Baumgarten, *Reflections on Poetry* (Berkeley: University of California Press, 1954), p. 78.

ordinator, acts and has consequences in the social, mundane, material and subjective functions of the sensitive universe. The baroque science operates the transition between old concepts and a new science for the properties of an aethereal structure. And it does so with the use of instruments of perception and as part of a changing society for the industrial and colonial era to come.

From its etymology related to the act of perceiving by sight (*specere* in Latin, meaning to look, see, observe or watch) the spectrum was first scientifically baptised as such by the possibility of image, extent of light and carrier of colours. The idea of the spectrum as invisible¹⁶¹ is, thus, a more recent construction of its property which normally differentiates light from the rest of its portions, such as the space of radio waves. Besides, differently from its more ancient perspectives, the current assumption about the spectrum assumes that it only comes into being through technological activation. As “body” and “substance”, the idea for the phenomenon was constructed from an inherent form, function, purpose, and qualities which intermingled with inanimate objects as it offered them meaning. Its confused, strange and unfamiliar semi-material ghostly appearance and form would give to the term its spiritual meaning as a divine mysterious composition.

From the ideas of aether and plenum as a philosophical basis to think of an abundant media-content communicational element, the spectrum as a baroque constitution presents the existence of an aesthetic character inherent to the knowledge which elaborated it. Understanding the epistemic construction regarding the spectrum allows us to argue that, without understanding the operations and tensions which carry its cognition, we would not be able to grasp the political possibilities which it presents. The hypothesis presented in this part of the thesis is that the political and emancipatory uses of the electromagnetic spectrum have to understand the genesis of its conceptual formation, which, in itself, presents a fundamental conceptual aesthetic notation. The historical moment of the inauguration of the term spectrum, its material and cosmological aspect along with its natural, spatial and spiritual unfolding, allows us to explore the baroque (as a conceptual style and expression of such extensions) as particularly important in the battlefield of media infrastructure. Either in the form of the studies of colour or as the aether, the spectrum – baptised at the core of this baroque science – represents a central element for the development of an epistemology which comprises perception, technical application, material-spiritual connection and a conceptual resistance to the existence of the void. At its essence, lies the effects of interference, abundance and pervasiveness.

161 See: Harvey J. Levin, *The invisible natural resource: Uses and regulations of the radio spectrum* (New York: RFF Press, 2011) & Peter Lewis & Jerry Booth, *The Invisible Medium: Public, Commercial and Community Radio* (London: Macmillan, 1989).

Up to the nineteenth century, the Western general epistemic history of what surrounds electromagnetic energy does not offer reasons to face it in terms of scarcity, since it is quality and not quantity which marks the spectrum's form, function and behaviour. It was historically seen as either vital, eternal and constant or fallible, imperfect and inferior presence. Contrarily to the idea of a rare resource, the historical, philosophical and natural history of the EMS presents the possibility to think of it as abundantly innate coupled with a produced sensible interference. This thesis assumes that the construction of scarcity and interference as political ideas to control the electromagnetic space is therefore a result acquired along the ways that electromagnetism took across its 'cultural', economic and technical history. Nonetheless, it was a baroque "more than ordinary curiosity of examining from whence it might proceed"¹⁶² which raised the conceptual tensions between the divine perfectness of his supra-natural form as well as its material abundant interference which lies in its modern creation and represents the actuality of its epistemic and social contradictions.

162 Isaac Newton, *Theory about Light and Colors*, *ibid.* p. I.

Chapter 3 - The Nineteenth Century: Romantic Harmonies

On 17 August 1953, Time Magazine featured on its cover Massachusetts' governor Christian Archibald Herter, who had been Speaker of the Massachusetts House of Representatives, Member of the US house of representatives and would continue his political career as Secretary of State under president Dwight D. Eisenhower and nominated the first United States Trade Representative under the presidency of John F. Kennedy. Married to the grand-daughter of oil magnate Charles Pratt, in 1921 he assumed a post at the Department of Commerce under J. Edgar Hoover, who was transforming the department "into an agency oriented to overseas expansion".¹⁶³ Diplomat, industrialist and politician, he specialized in foreign affairs and in 1947, as head of a committee of the house of representatives, he was responsible for making the Marshall Plan more palatable to the conservative Republicans. He began a diplomatic career as Ambassador in France from 1953 onwards. Before becoming Secretary of State, he also worked at NATO and at the Atlantic Council for the United States, having written in 1963 the text named "Towards an Atlantic Community".¹⁶⁴ A strong supporter of the North Atlantic relationship, he posited himself with no sympathy for civil rights, social instability and anti-colonial movements:¹⁶⁵ "Herter's public record indicates much concern for the oil industry (...) and a consuming interest in American aid to European economies".¹⁶⁶

In addition to the mastery of Western science and technology, the construction of the notion of radio waves which stands today has materialized globally from the establishment of the spectrum as a renewable natural resource, "always available in infinite abundance except for that portion which is being used".¹⁶⁷ As a "limited" and "scarce" natural resource, it can be "wasted", "abused" and "polluted", while its "use" and regulations would define a particular conception of its effects, centred in a techno-political economy of communications. Such definition comes from the ideas of Christian Archibald Herter Jr (son of Herter), born in Paris in 1919, when his father was participating in the USA delegation at the Paris Peace Conference, helping to elaborate the foundation chart of the League of Nations. Connected to the president Richard Nixon, C. A. Herder Jr. also had a career as politician and foreign relations specialist, becoming vice president of Mobil

163 Stephen R. Weissman, *American Foreign Policy in the Congo: 1960-1964* (London: Cornell University Press, 1974), p. 48.

164 Christian A. Herter, *Towards an Atlantic Community* (Council of foreign relations, New York: Harper and Row, 1963).

165 See: Stephen R. Weissman, *ibid.*

166 Stephen R. Weissman, *American Foreign Policy in the Congo*, *ibid.* p.48.

167 C. A. Herter Jr., 'The electromagnetic spectrum: A critical natural resource' in *Natural Resources Journal* (vol. 25, issue 3, 1985) pp. 651-663, p. 653.

Oil Corporation (the company of his great-grandfather) in 1961 and was appointed by Nixon as deputy assistant secretary of state for environmental and population affairs in 1970.¹⁶⁸

His text “The electromagnetic spectrum: A critical natural resource” defines “the nature of the electromagnetic spectrum as a natural and common property resource” which is “the natural resource which makes modern communication and communications development possible”.¹⁶⁹ It begins describing the Western economic and technological definition of the spectrum, emphasizing the impact on modern civilization and the application of precise technologies for the optimal and effective use of its portions, citing Hertz, Marconi and Morse as pioneers responsible for its global impact. Highlighting the role of radio waves in the “physical dimensions of time, space and frequencies”, he praises for legal instruments, territorial protections and national sovereignty, defending the spectrum as a “common property resource”.

His defence of the spectrum while “*res communis*, available to everyone and not subject to ownership,”¹⁷⁰ in a diplomatic way, reproduces the arguments of developed countries against the claim of developing countries that there was an “appropriation” in the use of geostationary satellites passing through their orbital territory. Thus, Herter Jr. argues that the bands, frequencies and the location from which radio signals are emitted and received – the satellites – can be allocated freely, as shared uses of a common space, such as border rivers or international waters. The geopolitical scenario of the cold war and the prominence of the non-aligned countries communities caused disputes between the nations regarding international treaties, agreements and regulations. According to Herter Jr., the advanced countries defended the right to “exploit a frequency without harmful interference, based upon the priority of registration”, affirmed that the doctrine of “a priori” uses, that is, the right to use belongs to the nation which firstly occupied the frequencies “leads to wasteful and inefficient use of the spectrum” and held expectations that “Technological advances will increase the likelihood of equitable access”,¹⁷¹ a promise forever held and never fulfilled.

Herder Jr’s argument is sustained by the perspective that an “international body”, the “expansion of effective utility”, “technical (...) and economic assistance”, “optimal results”, “careful management”, “institutional arrangements”, “legal regimes based on conventions, rules and

168 See: *Obituary, ‘Christian Herter Jr., legislator’ in The Boston Globe. Obituary, 2007. Available at* http://archive.boston.com/news/globe/obituaries/articles/2007/09/25/christian_herter_jr_legislator_bay_state_scion/

169 C. A. Herter Jr., ‘The electromagnetic spectrum’, *ibid.* p. 651.

170 C. A. Herter Jr., ‘The electromagnetic spectrum’, *ibid.* p. 655.

171 C. A. Herter Jr., ‘The electromagnetic spectrum’, *ibid.* p. 657.

regulations” would respond to the wishes of developing countries, and, in turn, would “likely to make them more receptive to the positions and plans that are forthcoming”,¹⁷² and finalizes:

The competition for the use of the ‘high frequency’ or short-waveband assumes strong political overtones. The issue of ‘equity’ versus ‘efficiency,’ ‘guaranteed access’ versus ‘technological innovation,’ is the same broad type of dichotomy that is at the core of the divergent views on so many so-called ‘North-South’ issues.¹⁷³

The political dilemmas of telecommunications in the twentieth century permeated advances in areas crucial to understanding the criticism addressed in this thesis in relation to the design, use and management of the radio spectrum. The scientific and technological revolution that combines the knowledge of the natural sciences with the production of instruments and technical applications serving an academic, laboratorial and industrial markets, and the geo-political dispute in the Atlantic world for natural, human and cultural resources are fundamental for the scenario created from the nineteenth century in relation to wireless technologies. The origin of these transformations lies in the role of disputes between science and the occultism and in the imperial economy based on the remaining colonialism and the growing global mass industry.

However, there is also an aesthetic influence which lies in the centre of such construction over the uses and perception of radio waves. The romantic modern Anglo-Saxon expression praised the liberal individualism, the creative genius, the purity and precision of communications and the political environment of the Nation State as a political expression of this autonomy.

So, how does the spectrum, so rapidly in comparison with the philosophical conceptual evolution of aetherial communication, became a central natural resource disputed by geopolitical logic? How Western society undermined the complex elaborations of its functions and characteristics in order to impose a notion which overlapped many of its spiritual, magical and cultural aspects and replaced it by a strict definition which would determine its fate? This chapter addresses these questions with the intention of identifying factors that formulated the aesthetic, geopolitical and economic power of the current idea of the electromagnetic spectrum. Thus, we can identify what are the targets of political and cultural criticisms of radio policies and regulations, move towards the understanding of these criticisms and examine how a counter colonial project can challenge practices conceived from this mentality.

172 C. A. Herter Jr. and others, *Radiofrequency use and management: Impacts from the world administrative radio conference*, (Washington: Library of Congress, 1980) p. 17.

173 C. A. Herter Jr., ‘The electromagnetic spectrum’, *ibid.* p.663.

Radiation

By the half of the nineteenth century, Michael Faraday had been working on experiments to demonstrate the properties of “lines of force” of magnetism, its field and its relation to electric currents. An important step in his experiments was to visually represent the magnetic field by pouring iron filings on a paper which laid above a magnet. He produced images (fig.3) which showed polarity, patterns and the location of energy on the field in what is probably the first visual representation of scientific verification of the magnetic field.

Fig 3: Diagrams by the English physicist Michael Faraday (1791-1867) of the magnetic fields around various configurations of magnets. Published in the Philosophical Transactions of the Royal Society (1852).

At the same period, a young Scottish scientist, recently appointed to Kings College in London was advised to seek studies in this new field in which Faraday was conducting experiments. In 1873, James Clerk Maxwell formulated the description of one singular force that regulates the interaction between the electrical charges and magnetic properties, which made the spectrum to be understood as a unique whole and a set of mathematical formulas.¹⁷⁴ By exploring electricity and magnetism, Maxwell mathematically proved that light is a portion of the electromagnetic spectrum and unified the relation between electric and magnetic fields, opening up the path to the demonstration of the existence of electromagnetic waves. His conclusion that the oscillation of electromagnetic waves propagated at the speed of light led him to realize “that light and magnetism

¹⁷⁴ James Clerk Maxwell, *A Treatise on Electricity and Magnetism* (New Yourk: Dover Book on Physics, 1954).

are affections of the same substance, and that light is an electromagnetic disturbance propagated through the field according to electromagnetic laws”.¹⁷⁵

The interest of Maxwell in light behaviour was, besides the mathematical resolution, also an inquiry into human perception in regard to colour. He was the first one to demonstrate a coloured picture, by combining the three primary colours of light. Thus, reaffirming the bonds between physics along with aesthetic perception, he integrated the property of seeing colours and light with a numerical language of a mathematical law which translated a fundamental force of the universe. Mathematically explained, the form of electromagnetism receives the aspect of radiation.

By exploring the physical aspects of heat, Maxwell indicated that “radiant heat” could “be treated, along with sound and light, as a branch of the great science of Radiation”.¹⁷⁶ The idea of *radius*, in Latin, refers to ‘ray’ or ‘beam’ and was also used to define the mathematical formula to measure the perfect, symmetric and harmonic form of the circle. As a movement from one place to another related to expansion and perception, the radial aspect of electromagnetism explains the form which unifies the behaviour of the energy used to hear sound, see light or feel heat:

We shall therefore consider the nature of radiation, whether of light or heat, in an independent manner, and show why we believe that what is called radiant heat is the same thing as what is called light, only perceived by us through a different channel. The same radiation which when we become aware of it by the eye we call light, when we detect it by a thermometer or by the sensation of heat we call radiant heat.¹⁷⁷

Although light and heat are not the same thing, they might propagate in the same manner and enact same effects, such as interference and perception. Being “of the nature of a transverse undulation in a medium”,¹⁷⁸ radiation could be then unified, isolated, measured and defined by the mathematical knowledge of its length, amplitude, direction, phase and velocity of propagation of the waves. Nikola Tesla, who experimented from the scientific principles of Maxwell would speculate on the sensible effects of the material form of the phenomena: “When ether waves impinge upon the human body, they produce the sensations of warmth or cold, pleasure or pain, or perhaps other sensations of which we are not aware, and any degree or intensity of these sensations, which degrees are infinite in number, hence an infinite number of distinct sensations.”¹⁷⁹

175 James Clerk Maxwell, ‘A dynamical theory of the electromagnetic field’, in *Philosophical Transactions of the Royal Society of London*. (vol.155, 1865) pp. 459–512, p. 499.

176 James Clerk Maxwell, *Theory of Heat* (New York: Dover Publications, 2001) p. 230. Available at: <https://archive.org/stream/theoryofheat00maxwrich/theoryofheat00maxwrich_djvu.txt>

177 James Clerk Maxwell, *Theory of Heat*, *ibid.* p232.

178 James Clerk Maxwell, *Theory of Heat*, *ibid.* p237.

179 Nikola Tesla, *On Light and Other High Frequency Phenomena* (New York: Star Publishing, 2012) p. 3. Available at: <<http://www.energyscienceforum.com/files/tesla/onlightandotherhighfrequencyphenomena.pdf>>

From the idea of *radius*, French physicist Édouard Branly named “radioconductor” a device which could detect the propagation of the invisible parts of light (UV rays), using for the first time, in 1890, the prefix “radio” to refer to wireless transmission.¹⁸⁰ The *Convention radiotélégraphique internationale* of 1906 inaugurates the regulatory term by which every wireless service for communication should be named: “Every telegram to be transmitted by the wireless telegraphy will carry in its preamble the indication ‘Radio’”.¹⁸¹

The Spirit of ITU

From Western theories, formulas and experimentations developed in the nineteenth century it was defined that the EMS is the range of all waves that propagate without a specific medium by the interaction between electric and magnetic charges forming an electromagnetic field. An electromagnetic wave, by its turn, is an oscillating form generated by the disturbance on the fields created by the charged particles combined with a magnetic current. Electromagnetism is considered one of the four fundamental or constant forces of nature, all of which derived from the action of one or more, being the three others nuclear, gravity and weak interaction.¹⁸²

The scientific development of such theory points to an expected formulation of a unified universal concept of energy: a “fundamental interaction” which governs the way in which objects and particles interact. In this search for the demiurge’s primordial energy, science becomes the spirit and an unavoidable language of a history moving towards knowledge. The intellectual primacy of Plato’s soul in the form of a radiation of knowledge is experimented and instrumentalized by Western science, expanding a verifiable new version of the spirit (*geist*). The last breath of the aether as an imperial spirit appears to aerate the subsequent neo-colonial function of the electromagnetic spectrum:

For the spirit in its further evolution is the inner soul of all individuals, although it remains in a state of unconsciousness until great men call it to life. It is the true object of all men’s desires, and it is for this reason that it exerts a power over them to which they surrender even at the price of denying their conscious will.¹⁸³

180 Jean-marie Dilhac, ‘Édouard Branly, the Coherer, and the Branly effect’, in *IEEE Communications Magazine* (Vol. 47, Issue 9, 2009) pp. 20 – 26. Available at: <<https://ieeexplore.ieee.org/document/5277448/?isnumber=5277441&arnumber=5277448&tag=1>>

181 “*Tous les télégrammes à transmettre par la télégraphie sans fil porteront au préambule l’indication ‘Radio’*” ‘Documents de la conférence radiotélégraphique internationale de Berlin 1906’ (Berlin: Département des postes de L’empire D’Allemagne, 1906). p. 19.

182 Known as fundamental interaction or fundamental forces, those phenomena deal with basic and elementary aspects of classic and quantum physics, being its understanding, the closest thing to approach a “theory of everything”, which would explain a unifying theory of the universe.

183 Georg W. Hegel. ‘Philosophy of objective spirit’, in *The Hegel Reader* (Oxford: Blackwell Publishing, 1998) p. 412.

Hegel related aether to *geist*¹⁸⁴ as an element in which the absolute knowledge is possible, in an analogy of what would be the “spirit of universe”: “Geist and being, ‘das reine Wesen’ [the pure being], spirit and aether are intermingled in a kind of psychophysical parallelism”.¹⁸⁵ Aether is, for Hegel, the environment where consciousness dwells after the evolution of the spirit from “that which has being *in itself*” and *for itself* only for us, to a stage where it becomes “an object to itself, but just as immediately a sublated object, reflected into itself”. Hegel defines such evolution of the spirit from something apprehended by the subject to something which has a meaning in itself and for itself as “science”: “The Spirit that, so developed, knows itself as Spirit, (...) its actuality and the realm which it builds for itself in its own element.”¹⁸⁶

Hegel’s “spirit”, as “the sole motive force behind all the deeds and aspirations of the nation”, marks the transition of the previous ideas related to the aether from an unstable sensible substance to a philosophical knowledge in which “Religion, knowledge, the arts, and the destinies and events of history are all aspects of its evolution”.¹⁸⁷ The political sense of the this spirit moves, in the nineteenth century, towards a science individually centred, historically deterministic, immutable, and essentially functional to the nation’s evolution. Although influenced by previous notions, the Hegelian spirit is a new vision of the role of the aether and its relational functions, which instead of communicating, expands its mandates in order to influence in unstoppable causality.

This new spirit of the nineteenth century, guided by the destiny of the nation and having the State as its political guidance, marked the imperialist deed present in the *Convention télégraphique internationale de Paris* of 1865.¹⁸⁸ The first coordinated international initiative to manage and regulate trans-borders communication intended to “assure to telegraphic correspondence exchanged between ours respective States the advantages of a simple and reduced tariff, (...) improve the present conditions of international telegraphy, and (...) establish a permanent understanding between

184 “Ether is therefore being (...) it constitutes everything (...) and does not change, for it is the dissolution of all things (...), this pure essence has eradicated and left behind difference as such” Georg W. Hegel, *Philosophy of Nature vol.1* (London: Routledge, 2010), p. 188.

185 Wolfgang Hagen. ‘The resonance of “bodiless entities”’: Some epistemological remarks on the Radio-Voice’, in *Sounds of Science – Schall im Labor (1800–1930)*, ed. by Julia Kursell (Hamburg: Max Planck Institute for the History of Science, 2009), p. 75.

186 Georg W. Hegel, ‘Phenomenology of Spirit’, in *The Hegel Reader*. (Oxford: Blackwell Publishing, 1998) pp. 55 - 56.

187 Georg W. Hegel, *Lectures on the Philosophy of World History*. (Cambridge: Cambridge University Press, 1975) p56

188 Convention télégraphique internationale de Paris (1865) et Règlement de service international (1865), in *Documents diplomatiques de la conférence télégraphique internationale de Paris*. (Paris : Imprimerie impériale, 1865) p. 2. Available at: http://www.itu.int/dms_pub/itu-s/oth/02/01/S02010000014002PDFF.PDF

our States”.¹⁸⁹ There, 20 representatives of European governments gathered in what would inaugurate the oldest United Nations’ agency, the International Telecommunication Union.

European Counts, Dukes, Barons, Ambassadors, Ministers, and chiefs responsible for telegraph and transportation departments,¹⁹⁰ engineering or diplomacy gathered at the headquarters of the ministry of foreign affairs of France to begin to regulate international communication formulating norms which would render the electronic communication that Hegelian spirit’s destiny to embracing the globe. The rationality of the ascetic protestant ethics, from a very secular perspective, helps to explain the two topics which were then objects of deliberation: tariffs and service regulations. The economic and political mentality which guided long-distance communication just before the appearance of wireless technology were based in the primacy of money and power, that is, the logic of the modern industrial market along with the modern capitalist state. The importance pertaining to the nation is demonstrated by the priority of the “dispatches of States” over “private” and “services” dispatches and by its territorial ruling over the telegraphic infrastructure: “Such wires are placed under the collective safeguard of the States from which they borrow the territory”.¹⁹¹

When the “Preliminary Conference in Wireless Telegraphy” took place in Berlin, in 1903, the colonial factor was present in the form of discussions over if empires should admit companies’ contracts with their self-governed colonies, since those territories were not signatories of the convention. The reason for the discussion was the French proposition according to which

If the contracting States concede to individuals or companies the construction or working of coast stations, they undertake not to concede or authorise the construction or working of such stations unless the applicants undertake to conform at all their stations to the stipulations of the present Convention and of the Regulations which it contemplates.¹⁹²

189 “*assurer aux correspondances télégraphiques échangées entre leurs États respectifs les avantages d’un tarif simple et réduit, d’améliorer les conditions actuelles de la télégraphie internationale, et d’établir une entente permanente entre leurs États, tout en conservant leur liberté d’action pour les mesures qui n’intéressent point l’ensemble du service*”. Convention télégraphique internationale de Paris (1865), *ibid.*

190 In capitalist economic system, transport and communication have paramount importance especially when process of circulation and direct production is considered. When a company owns not only the production to be traded, but also the infrastructure which carries it, it takes control of an enormous economic chain. This is the case for companies like Google, Amazon and Facebook which deal with high value goods (data) and seek to retain control over either the information as commodity and the infrastructure as transportation: “The improvement of the means of transport and communication likewise falls into the category of the development of the productive forces generally. (...) If one imagines the same capital both producing and transporting, then both acts fall within direct production, and circulation as we have considered it so far”. Karl Marx, *Grundrisse: Notebook V – The Chapter on Capital*. Available at <<https://www.marxists.org/archive/marx/works/1857/grundrisse/ch10.htm>>.

191 “*Ces fils sont placés sous la sauvegarde collective des États dont ils empruntent le territoire*” Convention télégraphique internationale de Paris (1865) *ibid.*

192 Preliminary Conference on Wireless Telegraphy (Berlin: ITU, 1903). p. 37. Available at: <<http://handle.itu.int/11.1004/020.1000/4.35>>.

Such a proposition marks a determination to expand the rules in order to make the European conventions and standards to be globally functional – fulfilling the role of that spirit destined to shed the light onto savage and unconquered spaces – consequently forcing the colonies to abide to the regulation appointed by the Empires at the cost of being left without the benefits of radio coverage.

The convention, besides arbitrating that “the exchange of superfluous signals and word is forbidden”, established the time in which different stations will be open according to their relevance and regulated transmission and reception standard procedures. Here, the regulations reach the rational order of ruling over the language, temporality and behaviour. No interference of unexpected noise, no transmission outside the determined time, including no improvisation on communication appeared as inaugural warrants in order to manage as well as control communication and the space it fulfils. As for the technical arrangement, the conference declared that “The exploitation of radiotelegraphic stations will be organized, whenever possible, in a way it does not cause trouble in the services of other similar stations”¹⁹³ and that

It is understood that in order not to hinder scientific progress, the provisions of Article 3 of the Convention shall not preclude the possible use of a radiotelegraph system incapable of communicating with other systems, provided, however, that inability to be due to the specific nature of the system and not to the effect of devices adopted solely to prevent intercommunication.¹⁹⁴

We can identify the early will to unify and homogenize a regulation in a way in which non-signatory/official transmissions along with their eventual technical assemblage could be accused of “precluding communication”, that is, interference. However, electromagnetic waves are “interference” by definition and design. The assessment that one signal cannot interfere in another is, therefore, conditioned by a political and economic order based on the control of the scientific application and commercial machines: the initial path of the industrial techno-political domination in relation to wireless media. The rational division and the aseptic signalling are requirements to the optimal communication.

193 “L’exploitation des stations radiotélégraphiques sera organisée, autant que possible, de manière à ne pas troubler le service d’autres stations de l’espèce”. Documents de la conférence radiotélégraphique internationale de Berlin 1906, *ibid.* p. 7.

194 “Il est entendu qu’afin de ne pas entraver les progrès scientifiques, les dispositions de l’article 3 de la Convention n’empêchent pas l’emploi éventuel d’un système radiotélégraphique incapable de communiquer avec d’autres systèmes, pourvu toutefois que cette incapacité soit due à la nature spécifique de ce système et qu’elle ne soit pas l’effet de dispositifs adoptés uniquement en vue d’empêcher l’intercommunication”. Documents de la conférence radiotélégraphique internationale de Berlin 1906, *ibid.* p. 354.

Romantic Vibrations

A central step taken by Western science of the nineteenth century in order to “invent” the EMS was the capability of measuring and mathematically translating the phenomena of electromagnetic flows into numbers, making it possible to divide, allocate and separate parts of the spectrum to its optimal use. Zita Joyce reminds us that “the range of electromagnetic waves appears to have been conceptualised in musical terms, as progression of octaves”.¹⁹⁵ Max Weber identified Western rational music in opposition to other forms by concentrating its analysis according to its divisions into octaves, fourths and fifths: “All rationalized harmonic music rests upon the octave (vibration ratio of 1:2) and its division into the fifth (2 : 3) and fourth (3 : 4) and the successive subdivisions in terms of the formula $n/(n + 1)$ for all intervals smaller than the fifth”.¹⁹⁶ The process described by Weber is an example of the rational Western – starting with Pythagoreans¹⁹⁷ – establishment of the rules to translate, denominate and divide the musical expression and make sense of its sensitive energies, vibrations and rhythms. Thus, elaborating the elements of this epistemic framework might result in a colonial control not only to distinguish it from dangerous, strange and savage melodies, but to rule over the very order for cognition of the spiritual, emotional and natural aspects of musical composition itself (as it appears in the case of the “efficient” meaning of the spectrum today).

The use of sine waves to represent the reduction to the most elemental aspect of music is a Western product of the nineteenth century science. It appears as a reproduction of the mathematical formulation regarding the physical form of the heat combined with studies concerning perception in the field of music, aesthetics and physiology, as explained by Blamey:

The sine wave appeared as a product of the combination of the theory for the analysis of heat developed by French mathematician and physicist Jean Baptiste Joseph Fourier (1768-1830), (...) its application to the question of musical sound by German physicist Georg Ohm (1787-1854) (...) and other ideas pivotal to the development of contemporary acoustics occurred in the latter half of the nineteenth century, many of which stem from the experimental research and publications on sensation, perception and musical sound by German anatomist and physicist Hermann von Helmholtz (1821-1894).¹⁹⁸

The measurement of waves, its reduction to an elemental form and the mathematical relation of its frequencies allowed the graphic representation of “a regularly fluctuating disturbance or

195 Zita Joyce, *Creating order in the ceaseless flow*, *ibid.* p35.

196 Max Weber, *The rational and social foundations of music* (Chicago: Southern Illinois University Press, 1958) p3.

197 Douglas Kahn comments that the “ordering principles of the Pythagorean acoustical cosmos” is associated with “the ideal, divine, consonant, rational, and harmonic”. Douglas Kahn, *Earth Sound Earth Signal*. *Ibid.* p53.

198 Peter John Blamey, *Sine Waves and Simple Acoustic Phenomena in Experimental Music - with Special Reference to the Work of La Monte Young and Alvin Lucier*. (Sydney: University of Western Sydney, PhD Thesis, 2008) p. 26.

vibration in the air.”¹⁹⁹ Blamey argues that Fourier “portrayed musical sound as a series of vertically arranged sine and cosine functions on a two dimensional grid, (...) thereby (...) not merely static, but depthless.”²⁰⁰ In this sense, the representation of the natural and physical phenomenon of music lost its friction with variations in perception to become, instead, a scientific justification for the evaluation of different forms of sensing and interpreting such physical behaviours. Georg Ohm suggested that the human ear perceived “better” the harmonic sound from this mathematical relation among frequencies, showing that the measurement and representation of physical phenomena are needed to impose a sort of aesthetic guidance which, thus, is taken as “natural” and “scientific”. To explain the wave was necessary to subsequently find a justification for one’s own sonic perception to overcome others by means of technological deduction:

If musical sound was to be comprised of simple tones, the ear had to be found capable of performing a disassembly procedure of this kind. The technological apparatus Helmholtz developed for hearing out individual simple tones not only involved the use of the ear, they also served as models of the ear’s design and function.²⁰¹

Herman Von Helmholtz observed and demonstrated, by the deployment of his “resonator”, that complex sounds could be reduced to simple sine waves, its most elemental form. Since the tones are explainable by mathematical relations of waves (frequencies, length, amplitude) and distinguished by: “1. their force, 2. By their pitch 3. By their quality”,²⁰² he is able to “prove that the human ear really does analyse musical tones according to the law of simple vibrations”.²⁰³ Such mechanical explanation of sound establishes the distinction between music and noise as it classifies the manner in which tones are felt by their numeric formation: “The sensation of a musical tone is due to a rapid periodic motion of the sonorous body; the sensation of a noise to non-periodic motions.”²⁰⁴ Even if he sees the “related combinations of tones by means of chords and chordal sequences (...) modulating into different keys” as “a much richer opening out of musical art than was previously possible”,²⁰⁵ he claims that the aesthetic aspects resulted from his experiments were “much more complicated” than to prove that “the physiological properties of the sensation of hearing exercise a direct influence on the construction of a musical system”²⁰⁶ by natural philosophy.

199 Peter John Blamey, *Sine Waves and Simple Acoustic Phenomena in Experimental Music*, *ibid.* p. 29.

200 Peter John Blamey, *Sine Waves and Simple Acoustic Phenomena in Experimental Music*, *ibid.* p. 264.

201 Peter John Blamey, *Sine Waves and Simple Acoustic Phenomena in Experimental Music* *ibid.* p. 43.

202 Herman Von Helmholtz. *On the sensations of tone as a physiological basis for the theory of music*, trans. by Alexander J. Ellis (London: Longmans, Green and Co, 1895) p. 10.

203 Herman Von Helmholtz. *On the sensations of tone*, *ibid.* p. 52.

204 Herman Von Helmholtz. *On the sensations of tone*, *ibid.* p. 8.

205 Herman Von Helmholtz. *On the sensations of tone*, *ibid.* p. 369.

206 Herman Von Helmholtz. *On the sensations of tone*, *ibid.* p. 371.

Electromagnetism's instrumental application was essential to Helmholtz's experiments in order to decipher frequency's composition and generate "artificial vowels". His resonator also generated a visual perspective of the mathematical constitution (the form of the sine wave) by the production of "representations that affirmed the link between regular physical vibrations and musical sound" as well as the observation of "the motion of bowed strings [by] recording the pattern of their movement in two dimensions".²⁰⁷

The policies regarding posture, voice, appearance and manners which is still widespread in commercial mass media clean aesthetics owes much of its principles to this mind frame enacted into radio transmission from the idea of a perfect, pure and unbiased communication. The romantic idea by which the voice could become bodiless through wireless²⁰⁸ inducted a formal way to conduce the sound and the aesthetic "style" of radio communication in early twentieth century Germany. The quality of this alienated voice took over the radio spectrum as if it was a cultural broadcaster which defined and classified forms of speeches centred in the concept of resonance, therefore, setting the tone for radio narration. The aesthetic of professional, commercial and mainstream broadcast is influenced by the regulation of speeches' posture carried out by a politics of imperial romantic aesthetics.

The idea of waves encompasses optic and sonic perception. It does not sound odd to speak about "the sound of the wave" nor to imagine it graphically. The waves, as form by which a movement is labelled, therefore, also have that metonymic facet, coordinating different objects, sensations and stimuli. In radio technology, one refers to the "carrier wave" to characterize the space of a form in motion where the transportation of signals happens by the resulting combination of frequency including the modulation caused by vibration. In his "Ontology of vibrational forces", Steve Goodman states that "A vibratory nexus exceeds and precedes the distinction between subject and object, constituting a mesh of relation in which discreet entities prehend each other's vibrations".²⁰⁹ As carriers of sound, acoustic waves are responsible for every sonic communication and articulation. As a material form, it is used as ornament, figurines, façades and pictorial representations. As representatives of movements, vibrations, expansions and overflowings, it has

207 "Helmholtz, using a small stylus attached to the tine of a sounding fork, inscribed a wavy line along a moving sheet of paper, a 'permanent image of the kind of motion performed by the end of the fork during its musical vibrations'". Peter John Blamey, *Sine Waves and Simple Acoustic Phenomena in Experimental Music*, *ibid.* p. 72.

208 "Kolb's theory of the so called 'bodiless essence of the voice' (körperlose Wesenheit der Stimme) alleged that the radio could let the inner pureness of the voice rise again in the listeners mind. Broadcasting the voice, as Kolb says, can produce a special kind of meta-personality in the listeners mind 'in the shape of bodiless beings'". Wolfgang Hagen. 'The resonance of "bodiless entities": Some epistemological remarks on the Radio-Voice', in *Sounds of Science – Schall im Labor (1800–1930)* ed. by Julia Kursell. p. 6. (electronic edition).

209 Steve Goodman, *The Ontology of vibrational force*, in *The Sound Studies Reader* ed. by Jonathan Sterne (New York: Routledge, 2012) p. 71.

inhabited poems and romances. Waves are, therefore, forgotten relics within the field of media archaeology.

Matthew Fuller enumerates a list of elements which compose “a sense of a technico-aesthetic life inventing and resensing itself through the process” in his parataxical list of “asymmetrical relations of being in media”²¹⁰ which ensembles a “connective disjuncture as a crucial term of composition” of pirate radios.²¹¹ Although radio waves are not one of his “this and thats”, it is possible to construct such fundamental topology of the EMS according to the conceptual approach chosen to illustrate “the moments when a series of forces, capacities, and predispositions intermesh to make something else occur, to move into a state of self-organization”.²¹²

Reaffirming the materiality of the radio universe by highlighting that “Electricity scratches the vitalist itch precisely because it involves the operation of matter on itself”, Fuller assumes that electricity is manifested through sound waves, but also that “this sound not only exists at a level independent of the technical and social assemblages that are mobilized around it; it also articulates them, gives them sensual, rhythmic, and material force”.²¹³ The focus on the EMS allows us to use an aesthetic perspective to approach the failure of the separation, in media, between form and content or technique and semantics, common to the epistemology rooted in the enlightenment, but criticized in Fuller’s valuable “media ecology”. Being an assemblage and a metonymy, radio waves carry form and content alike as their material existence in space is both natural and created.

The hylomorphic model which differentiates material form from meaningful practices, expressions and effects is criticized in Fuller’s media ecology based on the Simondonean idea of individuation and on Deleuze and Guattari’s “machinic phylum”. An alternative conception of the meaning of radio practices appears, thus, as a

dynamic and nonlinear combination of drives and capacities that, stimulating each other to new realms of potential, produce something that is in virulent excess of the sum of its parts [which] can no longer be disassembled; they produce an ecology. Not a whole, but a live torrent in time of variegated and combinatorial energy and matter.²¹⁴

210 Matthew Fuller, *Media Ecologies, Materialist Energies in Art and Technoculture*. (London: The MIT Press, 2005) p16.

211 Matthew Fuller, *Media Ecologies*, *ibid.* p. 17.

212 Matthew Fuller, *Media Ecologies*, *ibid.* p. 18.

213 Matthew Fuller, *Media Ecologies*, *ibid.* p. 19.

214 Matthew Fuller. *Media Ecologies*, *ibid.* p. 173.

Telegraph Aesthetics

Goethe's scientific romantic aesthetic – grounded in subjectivity – and his experiments on colour and light aimed to show how Newton got the wrong idea of the colour spectrum as something “pure”, ruled solely by physics. Goethe identified the artistic genius as an operation which conflicted the pure and the impure, the internal and external, seeking to “give back independent meaning to the human sensory organs”.²¹⁵ Here, the individual subjective perceptions act at a higher level than the physical and natural phenomenon. The tensions over the inter-operational abilities between the two – present in the baroque science – is replaced by the supremacy of a historical mission from individual creative potentials independent from external factors. The Anglo-Saxon modern romantic, based on visible representation, created the individual as the persona with the “artistic vision of the historical time”,²¹⁶ enforcing a deterministic perception in which the idea of evolution was pointed to the aesthetic as an autonomous field of individual subjective creation. Such an attitude also contributed to a political vision to design a socio-economic pattern for the exploration related to telegraphy and created a cultural justification for a specific way for the employment of electronic communication.

By combining visions and literary works of romanticism in the Anglo-American world, Paul Gilmore²¹⁷ explores the ways in which electricity interferes in the notion of aesthetic experience as well as in conceptions of how it appears in the form of art, materiality and in the social world. The radical conceptual transformation of the physical, individual and social spheres and their potential interconnection were operated by romantic artists and writers exploring dialogues between technology, individualism and spiritualism to better understand, demystify, neglect or interpret their own place in society. Romantic ideas coupled with experimental science were, therefore, connected by the feeling of an energetic aesthetic experience.

By assuming the centrality attributed to the political economy of telegraphy and electricity, Gilmore recalls the transformations caused by the creation of telegraphy as the first industrial-State monopoly in the changes of labour condition (“the telegraph fostered the hegemony of the

215 Siegfried Zielinski, *Deep Time of the Media: Toward an Archeology of hearing and seeing by technical means* (The MIT Press, Cambridge: 2006) p. 192.

216 “The visible represented to [Goethe] not only the first, but also the ultimate instance, that in which the visible is already enriched and attributed of all sense and knowledge complexity” [O visível representava para ele não só a primeira, mas também a última instância, aquela em que o visível já está enriquecido e imbuído de toda a complexidade do sentido e do conhecimento] Mikhail Bakhtin, *Estética da criação verbal* (São Paulo: Martins Fontes, 1997) p. 245.

217 Paul Gilmore, *Aesthetic Materialism: Electricity and American Romanticism* (Stanford: Stanford University Press, 2009).

commodity form”²¹⁸), of the women’s role in telegraph industry and the debates around the link between voice, body and consciousness, and of dynamics of long distance communication. The novelty of this “electric aesthetics” also engendered creations which explored fantasies and sensibilities around either the possibility of a unifying perspective of spirit, technology and the individual as well as the vision of an integrated global objective based on a liberal techno-utopian society. Thus, the notion of the “electric aesthetics” appears politically concrete, for it operates changes in bodies, interpersonal and subjective relations and in political economy, denying “the ideal of the art-object as a transcendent, self-sufficient unity detached from the social world”.²¹⁹

In the *Convention radiotélégraphique internationale* of 1906, the ITU established the norms, system and fees for an international agreement on how to manage wireless maritime communication. It was established that “The choice of the radiotelegraph system to be employed by coastal and board stations are free”,²²⁰ although all stations should be able to receive and transmit in Morse code.²²¹ Gilmore argues that the encounter between Samuel Taylor Coleridge and Samuel Morse represented the confluence of romantic electricity idealism with the techno-utopian artistic goals related to the electrical science “fostering and diffusing a rational model of behaviour and social structure”.²²² Radio regulations, therefore, rises as to follow the technique, aesthetics and politics of the mindset of racist,²²³ romantic and individualist ideology, which was latter praised by Marconi, the greatest beneficiary of the radio-spectrum economical use, in a broadcast on the 100th anniversary of the telegraph:

I would pledge my own tribute [to Morse’s] memory by saying that I am sure he would have rejoiced in the knowledge that it is on the foundation of his invention that we are building a bridge of peace and friendship across the Atlantic with radio. He would be happy to know that he has enabled the people of the two countries he knew so well- America and England - to exchange messages and greetings of good will both by the written and the spoken word.²²⁴

218 Paul Gilmore, *Aesthetic Materialism*, *ibid.* p. 83.

219 Paul Gilmore, *Aesthetic Materialism*, *ibid.* p. 2.

220 “*Le choix du système radiotélégraphique à employer par les stations côtières et les stations de bord est libre*”. *Documents de la conférence radiotélégraphique internationale de Berlin 1906*, *ibid.* p. 17.

221 The adoption of the alphabet created by Samuel Morse, reinforced the technical and romantic modern reproduction of “physical precision” which, at the same time, demonstrated the Western confused relation between material and spiritual realms: “Media always already provide the appearances of specters. (...) Accordingly, the invention of the Morse alphabet in 1837 was promptly followed by the tapping specters of spiritistic seances sending their messages from the realm of the dead”. Friedrich Kittler, *Gramophone, Film and typewriter*. (California: Stanford University Press, 1999) p. 12.

222 Paul Gilmore, *Aesthetic Materialism*. *ibid.* p. 22.

223 Samuel Morse was president of “The society for diffusion of political knowledge”, which released a text named “Results of Emancipation”, attacking the abolishment of slavery arguing that it might lead to a clash between the races and that emancipation of slaves would “remove a cornerstone which God has laid”. See: Forrest G. Wood, *Black Scare: The Racist Response to Emancipation and Reconstruction* (Los Angeles: University of California Press, 1970) & Matthew J. Clavin, *Toussaint Louverture and the American Civil War: The Promise and Peril of a second Haitian Revolution* (Philadelphia: University of Pennsylvania Press, 2010).

224 Orrin E. Dunlap, *Marconi: The Man and his wireless* (New York: The Macmillan Company, 1937) p. 308-309.

The modern romantic Anglo-Saxon conceptions of electricity and radio, by twisting, imposing as well as directing its expressions based on individualistic and conservative ideologies, acted also as a colonial power over communication. This meant a central role for electric technology and the telegraph as driving forces either for “peaceful Euro-American conquest”²²⁵ as well as changes in the Atlantic world regarding the solidification of capitalism, the fortification of the individual primacy and the free flow of people, commodities and information. In this sense, the telegraph is a constitutive part of a particular aesthetic which shaped modern world-views and political economy: “This mode of aesthetic thought, as with Morse’s technological imaginings and his racist politics as well as Coleridge’s romantic idealism, expresses a fear of the very basis of aesthetic thought, the sensuous body and its chaotic, potentially indeterminate reception of the world”.²²⁶

The electric potential of liberating communication from material restraints was a spirit of the times and a desire to free the individual expression from the strains of location and mobility of the body. Driven by Federalist ideology alongside republican feeling, Morse saw in the telegraph the sort of disembodied project which would free art and expression from the chains of sensuousness and render it citizenship: “The telegraph’s great potential derived from its apparent ability to separate its message from physical bodies — human, animal, material (...) was essential to Morse’s project of freeing art from the taint of sensuality and granting it its proper role in fostering republican virtue”.²²⁷ Such combination of idealism, individualistic sovereign expression and republicanism marks the electrical aesthetic as “a model for exploring the diffusion of the self through material forces, language [and] commodities”²²⁸ which, together with the expansion related to industrial capitalism and the enforcement of instrumental rationality, shaped the technological and political landscape of a colonial wireless communication.

As related to the spectrum in the role of one of its composites and representative of the reason of the epoch when radio was born, electricity and telegraphy are also part of this spectral composition. However, the aesthetics of the telegraph in colonized areas was felt in a much savage way and interfered in the very materiality of the landscape, showing the dramatic effects of the romantic creation of this “new self and its reconfigured relations of body, society, and world”.²²⁹

225 Paul Gilmore, *Aesthetic Materialism*. *ibid.* p. 21.

226 Paul Gilmore, *Aesthetic Materialism*. *ibid.* p22.

227 Paul Gilmore, *Aesthetic Materialism*. *ibid.* p46.

228 Paul Gilmore, *Aesthetic Materialism*. *ibid.* p110

229 Paul Gilmore, *Aesthetic Materialism*. *ibid.* p110.

Discovery, Creation, Invention

From Hugh Aitken's project of exploring and researching the spectrum as a "freeware", that is, by different researches in different modules and angles, Zita Joyce mentions his assumption according to which "Herz's experiments at Karlsruhe in 1887-88"²³⁰ is a point of departure for the "discovery" of the EMS. That discovery is described as if it was a colonial adventure: "in a form of the common analogy that relates radio spectrum to land and is used to justify particular forms of power over radio spectrum (...) which had been speculated about but not previously proven".²³¹ Such analogy allows us to think of a sort of colonial approach²³² towards the novelty as an "invisible", "unexplored" and "unknown" space full of potential resources, resembling another Hegelian idea of the "new" world in terms of a space that "have only lately become known to us" and which presents a psychic weakness and physical immaturity.²³³

The "discovery" of the electromagnetic spectrum marks the end of "the century of frequency", the devaluation of the aether as medium and the rise of radio as the new instrument for control, guidance and cultural influence. The hybrid substantial assemblage which would be known as electromagnetic spectrum, previously imagined as an encounter among physics, perception, materiality, spirituality, beauty and sensations gave way to physical laws, conventions and regulations based on limited availability and natural disorder attributed to the radio portion of the spectrum.

Although radio-frequencies are currently defined as "an ordered sequence of radio waves that enables efficient allocation (...) and it is the framework through which governments manage access to radio technologies",²³⁴ Zita Joyce argues that the notion of the spectrum is, instead, a "discursive structure" "created (...) by the socially driven processes of science, technology, policy, and economics (...) that was 'invented' as a means of making sense of the world".²³⁵ She argues that, as a socially designed "hybrid formation", the spectrum is subject to conceptualizations and concretizations "far less stable than the singularity of its signifier suggests".²³⁶ Such analysis would

230 Hugh Aitkens, 'Allocating the Spectrum: The origins of radio regulation', in *Technology and Culture*. (vol. 35, n. 4, 1994), pp. 686-716, p. 686.

231 Zita Joyce, *Creating order in the ceaseless flow: The discursive constitution of the radio spectrum*. (PhD Thesis) (Auckland: The University of Auckland, 2008). p. 13.

232 Joyce adds that "Aitken argues, that 'the problems presented by the discovery of the radiofrequency spectrum, a resource created by science and technology, came to have, as the nineteenth century neared its close, clear similarities to the problems faced earlier in the opening up of new continents' (1976: 32). Aitken also uses the continent analogy to describe the process of exploration that produced an understanding of the physical expanse and continuity of the radio spectrum". Zita Joyce, *Creating order in the ceaseless flow*, *ibid.* p13.

233 Georg H. F. Hegel. *The philosophy of history* (Ontario: Batoche Books, 2001) p98.

234 Zita Joyce, *Creating order in the ceaseless flow*, *ibid.* p. 4.

235 Zita Joyce, *Creating order in the ceaseless flow*, *ibid.* p. 196.

236 Zita Joyce, *Creating order in the ceaseless flow*, *ibid.* p. 196.

see the operation of the “creation” of the spectrum as different from its “natural constitution”: “These aspects reveal the radio spectrum’s multiple constitutions as a natural object, a social object, and a product of discourse (...), an element of both ‘nature’ and ‘society’”.²³⁷ Rightly arguing that the notion of spectrum as a “natural resource” hides the internal conflicts of its multiple constitution, she criticizes the conception of “natural radio” as a resource from nature, for “although [the spectrum] exists independently of human technologies, it is only perceivable through technology (...) [and] primarily invoked through concepts of scarcity and vulnerability, which are used to justify measures such as the protective administrative processes”.²³⁸

Such a liberal construction of the spectrum is represented by the acceptance of Harvey Levin’s claim that “The communication frequencies that constitute the radio spectrum are a natural resource essential to the living in the modern world”.²³⁹ As an “invisible natural resource”, the spectrum is detached from its hybrid and fragmentary composition to be taken as a “full” subject with “economic value”, “technical capability”, “effective utilization” and “administrative action” which, “Like other natural resource, (...) is developed in relation to supply and demand”.²⁴⁰ This idea has two effects: On the one hand, it conceives the spectrum as a messy substance which shall be ordered by the technical, social, political and economic standards of capitalism, impeding us from defining it otherwise; on the other, fuels the colonial environmentalist perception according to which the natural resources are disconnected from human creations and should be protected, conserved and safeguarded from them. Both perspectives have in common the affiliation to a particular Western intellectual framework which today seeks to balance the good will of environmental discourse with the pseudo-progressive language of the latest technological solutions.

As to relate the political aspect of this “discovery of a new continent” to the radio waves status, Joyce understands Aitken’s mentions to “landfalls” and “geographical measurement” to regulate the spectrum as a process of control. Indeed, the mentality which guided the early colonial enterprises was one of ordering the wilderness as well as the unknown into a controlled environment. Highlighting the political processes involved in the nineteenth century application of rational methods to explain and dominate natural physics, Joyce understands that this discovery is the birth of a “discursive construction”. We should also note this discursive construction in the process of “understanding, take possession and destroying”,²⁴¹ which Tzvetan Todorov relates with

237 Zita Joyce, *Creating order in the ceaseless flow*, *ibid.* p. 7.

238 Zita Joyce, *Creating order in the ceaseless flow*, *ibid.* p. 198.

239 Harvey J. Levin, *The invisible natural resource: Uses and regulations of the radio spectrum* (New York: RFF Press, 2011) p. 1.

240 Harvey J. Levin, *The invisible natural resource*, *ibid.* p.15.

241 Tzvetan Todorov. *The conquest of America*, trans. by Richard Howard (New York: Harper and Row, 1982) p. 127.

the colonial domination of Latin America. Being such an operation of a colonial aesthetic domination and knowledge imposition, this parallel allows us to articulate the formulation of the ordered spectrum within the broader framework of colonial epistemic order.

After that “discovery” stage, says Joyce, the nineteenth century brought a scientific model to “create” the spectrum. This creation constitutes the establishment of “an ordered sequence of frequencies for human communication”²⁴² provided by experimental tools as well as using combined technologies leading to the commercialization and exploitation of wireless communication grounded in the division pertaining to wavelengths. In order to make sense for the scientific frame, this path “from science to technology” had to accomplish several methods which would render rational validity to the function of the spectrum. The steps to ordinate, measure, identify, classify, divide, name and reproduce it, were taken to make the phenomena not only ‘intelligible’ but available for further exploitation by the dominant epistemic, economic and political power.

Finally, Joyce highlights the “invention” of the spectrum when, in 1906, the radio spectrum fell under the control of constituted powers from the first “radio-telegraphy” ITU meeting. Therein, as a “tool for allocation”, it could be internationally used from regulated distribution and managerial processes which would thrive the economic and political exploitation of the resource. The most prominent figure of this stage is Guglielmo Marconi, who translated “scientific and technological developments into a commercial framework [establishing] some of the fundamental issues that have driven discussion of radio spectrum so far”.²⁴³

Armin Medosch²⁴⁴ reminds the early use of radio technology in the “strange experiments” conducted by Marconi to transmit signals from Rome to “the sands of Tripoli”, in Libya,²⁴⁵ as a sign of colonial geopolitical power, since the then Italian colony did not have a transmitter, but only a receiver. Pointing out that “the discovery of radio waves and the development of first applications in the late nineteenth century should be understood within a typically capitalist framework of ‘innovation’”, Medosch notices an irreparable geopolitical consequence from the exploitation of its

242 Zita Joyce, *Creating order in the ceaseless flow*, *ibid.* p. 34.

243 Zita Joyce, *Creating order in the ceaseless flow*, *ibid.* p. 38.

244 Armin Medosch, ‘Closing the gap between apparatusic form and imaginary museum’, in *The next Layer: Art, Technology and Social Change*. 2007. Available at https://webarchiv.servus.at/archive.thenextlayer.org/node/109/index.html#footnote2_k6q9jla. Accessed in 18/10/2018.

245 The presence of Marconi in Libya while testing radio technology is documented in Orrin B. Dunlap, *Marconi: The man and his wireless*, *ibid.* p. 162. “He returned to Rome on December 29, 1911 from the sands of Tripoli where he had been conducting some strange experiments.”

capabilities. The colonization of the radio spectrum's frequencies lies under the aegis of the twentieth century.

The scholarly tradition of Latin American studies avoids the term 'discovery' to refer to the landfall of Europeans in the large piece of land which conveniently stood between Africa and Asia. Luckily, for the Europeans of the nineteenth century, the radio waves were easier to reach as well as occupy. This tradition has an emblematic study in O'Gorman's "The invention of America" where, analysing the continent also as a "discursive formation", he states that America's "appearance in the heart of culture and history" was, instead of a sudden revelation, a "complex ideological process which, through a series of trials and hypotheses, ended up by rendering them a particular and singular meaning".²⁴⁶ José Rabasa explores this invention from a semiotic and deconstructionist perspective in his "Inventing America". Carlos Fuentes, pointing to the catholic contribution to the colonial endeavour, adds that the invention of America is inseparable from its baptism,²⁴⁷ highlighting the consequences of the process of assigning, classifying and naming. Karen Kupperman says that "Europeans saw America most immediately as a resource for the old world"²⁴⁸ and Stephen Greenblatt sees the continent as "fabricated": a result of a process of production from the encounters. A unified perspective is that 'discovery' is not the right term to illustrate this process, for neither was the place an absent emptiness, nor was the European narrative free of past vices when "announcing" this novelty, being the American event full of influences from the old-world imaginary and conceptual frameworks.²⁴⁹ Europe had a previous notion which was applied to a new and strange reality, forcing a familiar mode of understanding, interpreting and managing the novelty. The spectrum, like America, also suffered from colonial original vices for it was, prior to the discovery, an existence full of composites and notations imagined as an enlightenment revelation which became a resource to be explored and a novelty to be named, devised and allocated. The analogies made by Aitken to describe the early stages of the exploitation of the electromagnetic event reveal the colonial incapability of treating as existent and vivid something that it is not yet under conceptual control.

246 Edmundo O'Gorman, *A invenção da América* (São Paulo: Unesp, 1992) p. 177.

247 "The concept baptism calls for a specifically philosophical taste that proceeds with violence or by insinuation and constitutes a philosophical language within language – not just a vocabulary but a syntax that attains the sublime or a great beauty." G. Deleuze & F. Guattari, *What is philosophy*, trans. by Graham Burchell and Hugh Tomlinson (London: Verso, 1994) p. 8.

248 Karen Kupperman. *America in European Consciousness, 1493-1750* (Los Angeles: UNC Press Books, 1995).

249 A good account of the reports related to the European imaginary and its transplantation to the reports of discovery is given by Jorge Magasich Ariola & Jean Mark de Beer, *America Magica: When the renaissance Europe thought it had conquered paradise*, (New York: Anthem Press, 1994). In the book, they describe how the marvel characters are introduced into the narratives by previous theological, mythological and fable beliefs. Elements as Griffins, Dragins, Giants, people with tales and places like the earthly paradise, *el dorado*, Atlantis and King Solomon mines are associated with both religious faith and/or exaggeration.

From the perceptions that we were surrounded by an aethereal substance which excited science, philosophy, magic, spirituality and cosmology, the EMS has suffered a process of disenchantment, which, in the view of this thesis is part of a broader process of rationalization, scientific instrumentalization and epistemic imposition which forces the strange to become familiar, making this a familiar language for practical domination. As part of the same process of modern disenchantment of society, the discovery, creation and invention of the spectrum is a unified method by which colonial science, aesthetics, as well as the political economy take possession of the subject by acting upon its comprehension and explanation in order to delimitate its practices.

Just as the emblematic picture of America by Hegel as “the land of the future, where, in the ages that lie before us, the burden of the World’s History shall reveal itself”²⁵⁰ over its inner primitive logic which “must expire as soon as Spirit approached it”,²⁵¹ the current assumption of the spectrum’s constitution, use and potentialities could be faced as limited, biased, colonially centred and prejudicial. Today, instead of providing epistemic approaches to entail researches, experimentations and transformations on our perspectives over communication, technology and aesthetics, this view contributes more to the lingering of the economic and political status quo of wireless communication. Discovery, creation and invention are unified steps necessary to construct the EMS’ present ‘colonial’ constitution. Nonetheless, I expect to identify aspects taken by the spectrum’s usage and perception which represent manners of defying its dominant epistemic order and control.

Final Remarks

Douglas Kahn identifies “natural radio” as perceptible gradations of electromagnetic effect. As a primordial aesthetic connection with the spectrum and its wave form, which is captured and revealed through sounds or more subtle energetic forms (like brain waves and light²⁵²), this natural status of radio belongs “to an energetic state that already existed in spheres of signal plenitude, in naturally occurring and anthropic ways”.²⁵³ Kahn points out that Thomas Watson, Graham Bell’s assistant, was the first person to listen to electromagnetic radiation as “natural radio” due to their experiments with the telephone, where the metal wires connecting the devices acted as antennas to

250 Georg H. F. Hegel, *The philosophy of history*, *ibid.* p. 104.

251 Georg H. F. Hegel, *The philosophy of history*, *ibid.* p. 98.

252 “Within the history of electromagnetism and the arts, light behaved similarly to natural radio to the extent that it was perceived as a natural material force in the 1960s after having a largely discursive and instrumental status earlier in the twentieth century.” Douglas Kahn, *Earth Sound Earth Signal*, *ibid.* p. 209.

253 Douglas Kahn, *Earth Sound Earth Signal*, *ibid.* p. 127.

receive electromagnetic sounds from the space. The articulation between acoustic and electromagnetic energy is possible by the transduction, a “movement within and between classes of energy”.²⁵⁴ Embodied in the “aelectrosonic”,²⁵⁵ instrument which provides this movement from electromagnetic energy to the material, objectile acoustic function, finds its final existence in the “physics and physiology of perception”.²⁵⁶ Kahn indicates here that this “energetic environment” rooted rather in nature than in technology and aesthetically perceived through the material and physical connection between classes of energy “are more amenable to an evolving cosmogenesis than to a structured cosmology”.²⁵⁷ Kahn describes, therefore, the spectrum as something more than a resource in terms of its natural existence; as an energy which captures and unveils, through unspoken connection, experimentations and accidentally, the aesthetic properties of the spectrum.

The spectrum has, thus, a philosophical, scientific and historical construction which had been embraced and determined by an aesthetic element. The cognition over its sensitive, perceptive and expressive nature had determined and transformed its political and economic history. The turn of the nineteenth to the twentieth century, at the same time that enhanced the Western extension of electromagnetism’s epistemic construction by exploring the spiritual and magical senses of popular instruments, downgraded and hid differential manifestations which did not contributed to its dominant economic and political goal.²⁵⁸ The colonial role of industrial aesthetics and romantic science contributed to the overcoming of strange and threatening logics which did not respond to the development concerning its global techno-scientific network. Without being able to fully separate and move itself away from the magical and spiritual sense of electromagnetism, instrumental rationality moves towards a colonization of knowledges which justifies the modern logic of intellectual and spatial property, governance and the management of the numeric translated phenomena of wireless infrastructure.

254 Douglas Kahn, *Earth Sound Earth Signal*, Ibid, p. 54.

255 In contrast, “the Aelectrosonic moves from electromagnetism to sound, that is, from the class of electromagnetic energy to the class of mechanical energy. That electromagnetic fields and waves require technology for transduction into sound means that they have been occluded by mechanisms of control.” Douglas Kahn, *Earth Sound Earth Signal*, ibid. p. 8.

256 Douglas Kahn, *Earth Sound Earth Signal*, ibid. p. 56.

257 Douglas Kahn, *Earth Sound Earth Signal*, ibid. p. 53.

258 Bernard Geoghehan investigated the relations between “unsettled features” with the progress promised by technology in the 19th century. He argues that spiritualism contributed to infrastructural networks of communication by filling the gaps, delays and incomplete features of communication. The “infrastructural uncanny” and “unsettled features” bridged spiritualism with the partial responses given by technology and modernity by means of “operating at cross purpose to established knowledge, actively bringing alien agents into the social order” and enabling “new forms of productivity in existing scientific and industrial systems” See: Bernard D. Geoghehan. ‘Mind the Gap: Spiritualism and the infrastructural uncanny’, in *Critical Inquiry* (n.42, 2016) p. 917 and p. 902.

The Western science from the period of imperialism formulated the “laws” for electromagnetism according to commercial instrumentalization and technological application. The technological direction of senses became utilitarian and was developed to fit Western industrial society, following the expansive path of colonial logic in its spatial, cultural and economic form. The path from a baroque synaesthetic, ambivalent and ambiguous wave behaviour to a calculated, manageable and romantic wave marked the ideas of a governable ethics of natural expressions and imprinted a human posture to deal with the form by which they were legitimately explained. In the nineteenth century the act of communicating at a distance by an instrument, disregarding the use of magic and spiritual aid, was related to romantic individual sentiments: “two friends separated from each other could communicate with compass needles magnetized by the same lodestone, and thus remain sympathetically attuned forever.”²⁵⁹

The connection between romantic aesthetics, colonial geopolitics and the search for natural resources in the industrialization process of the nineteenth century is central to understanding the defense of the spectrum as a common good. In this way, the same logic that guided the search for water, oil, wood and minerals could be transplanted to electromagnetic phenomenon. Industrial interests have been a playing fundamental geopolitical role and although the radio spectrum is not a “raw material”, in the same sense as ores, water, oil and wood, the logic that accompanies the predatory search for these, is present in the occupation, property and usufruct of the spectrum.

Thus, the perspective of the spectrum as an invisible natural resource, is a particular impression created about the commonality of nature. It is worth remembering that the discussion about commons comes from the dilemmas around the use of land in England, being questioned by the so-called “tragedy of commons” and, in this case, revisited in order to convince that a certain group can use and preserve natural resources in a communal and sustainable way. However, what is posed here is that the discourse on the common ownership of natural resources is based on an unequal presupposition from an economic, military, political, technological and conceptual point of view. The rule established in the *Carta Magna* is substantially different from what is present in other cosmologies and cultural perspectives. Thus, the defence of a common use serves much more to those who already have technical, scientific, political and economic power than for those who not only observe nature differently but are the ones who suffer the most from the scarcity of these resources.

259 Carolyn Marvin, *When Old Technologies Were New: Thinking About Electric Communication in the Late Nineteenth Century* (Oxford: Oxford University Press, 1988) p. 155.

In the case of the radio spectrum, Western geopolitics, driven by scientific knowledge and technical standardization, establishes a series of rules, statutes and regulations that start from a particular and constructed about the meaning of the usage of this resource. Even when it comes to the composition and correlation between the invention of the spectrum and aesthetic sensitivities, the set of rules that manages the radio waves leaves aside aspects of the EMS history that connects it with subjective feelings, senses and emotions in order to focus on technical optimization and rational of its use, not coincidentally, the type of use that provides profits and power political power for those who make such decisions.

This instrumental rationality grounded in the Anglo-Saxon mentality is also guided by the romantic ideal of Western modernity, particularly that which values the purity of voices and messages, the perfection of the subjective spirit of artistic genius and the fine arts as a way of translating the prominence of the scientific and rational knowledge. Classical music from the nineteenth century, the cataloguing of the biological and natural world, the study of human races and the optimization of science through industrial technology will guide the control over radio waves and mark a conceptual domination against what is not in the scientific books or is not understood within a particular, Western, industrial and colonial shape.

The nineteenth century also bears a particular reminiscence of spiritualism, magic and mysticism. Rationality, in its struggle against the occult, the supernatural, the supra-human and the religious, still shows the resilience of fanaticism, obscurantism and mysticism that survive to this day. Within the same epistemological mindset, the two currents have become burdens for humanity. On the one hand, the religious fanaticism plays an intense political role in the form of obscurantism, denial of science and knowledge and celebration of religious dogma. On the other hand, the radicalization of purity and rationality presents us with a scenario that resulted in fascism, environmental disaster and the elimination of cultures and aesthetic expressions. From the same epistemological perspective, the West has failed to divide spheres of knowledge as well as to manage natural resources and phenomena.

Mounted in this arena, the aether becomes the spectrum and the spectrum becomes radio. Disenchantment, instrumental technicality and the colonization of natural resources therefore appear as a political project of modernity.

To get an idea of how the colonial reality interferes with the relationship established between the telegraph, aesthetics and social dynamics, we can look for a picture of the occupation of the Brazilian territory from the installation of the telegraph lines in early twentieth century. In this case, the effects of the electric aesthetics could not be further from the ones imagined by the romantic

vision of the universal harmony of electronic communication. From 1907 to 1912 the *Rondon* commission installed a telegraph line which ran from *Cuiabá* to *Porto Velho*, in the central-west and northern region of Brazil. Lévi-Strauss, repeating the path of the expedition,²⁶⁰ narrates that, “living in the ‘Rondon line’ was much like living on the moon”.²⁶¹ As part of the project of “interiorization of colonization”,²⁶² the *project Rondon* sought to explore the backlands in an enterprise of, for Levy Strauss, “erratic nature”, which represented “the extreme limit [Western man] attempted to cross” in order to give a “final authenticity to the surrounding wastelands”.

In the search of richness and work opportunities – “an El dorado or a second Far West” - Brazilians were taken to explore the backlands and provide signs of modern colonization by integrating the most primitive parts of the country, exploring the territory and natural products, mainly drugs. The maintenance of the telegraph lines and technical operation were made partly by Indians who were recruited by the telegraph commission and instructed by the army. The demonic aspect of the landscape, narrated by the ethnologist, includes the *Nhambiquaras*’ “morbid fascination for the servants of the line”²⁶³ whose – as the story goes – filled the chest of a worker with arrows, buried him to the chest and attached the transmitter in his head. The telegraph line, and before it, the electricity it carried (the reason for its existence) marks the conflicts around colonization in the heart of the landscape.

In his report, Levy Strauss describes the landscape alongside and across the trail and mentions the idea of *picada*²⁶⁴ as the “summary track which runs alongside [the telegraph line] for nearly five hundred miles”, being “the region’s only landmark”. The unknown starts at the moment when one leaves the *picada*, the only visible, familiar and distinguishable spot across the path of 700 Kilometres:

but the wire, obsolete from the day of its completion, hung down from the poles never replaced when they go to rot and tumble to the ground. (Sometimes the termites attack them, and sometimes the Indians, who mistake the humming of the telegraph wires for the noise of bees on their way to hive.) In places the wire trails on the ground, or has been carelessly draped across the nearest little tree.

260 Worth mentioning that Lévi-Strauss explicitly mentions the telegraph many times, which is paramount in his method and strategy for the study of the *Nhambiquaras*: “I was much tempted to follow the telegraph line, or what remained of it, and in so doing to try to find out exactly who were the *Nambikwara* and who too, were those enigmatic peoples, farther to the north, whom no one had seen since *Rondon* had left a bare mention of their existence” Claude Levy Strauss, *Tristes Tropiques*, trans. by John Russel (New York: Criterion Books, 1961) p. 237.

261 Claude Levy Strauss, *Tristes Tropiques*, *ibid.* p. 262.

262 On this process, See: Celso Furtado, *Formação Econômica do Brasil* (São Paulo: Companhia Editora Nacional, 2000).

263 Claude Levy Strauss, *Tristes Tropiques*. *ibid.* p. 264.

264 A man-made narrow path opened inside the jungle (or *selva*, a natural formation derivative from the Latin *salvaticus* and French *sauvage* from where the word *savage* / *selvagem* comes from), in order to facilitate entrances into dense woods.

Paradoxically, in short, the line rather aggravates than takes away from the prevailing atmosphere of desolation.²⁶⁵

The erratic elements which run alongside the *picada* combined “the contorted outlines of the remaining poles, the reversed arcade of the pendent wires” with “an entirely virgin landscape (...) so monotonous as to deprive its wildness of all meaning”,²⁶⁶ which the anthropologist relates aesthetically not to some romantic Anglo-Saxon painting or a federalist poem, but the surrealistic images of Yves Tanguy.²⁶⁷ The artistic representation of colonial reality in times of scarce electricity could be seen also in Candido Portinari or Almeida Jr., Brazilian painters who depicted the *sertão*²⁶⁸ not as a surreal image but in realistic style. Lévi-Strauss could have also mentioned the more savage representation of tribal figures from the surrealist Eugenio Granell or the figurative devilish landscape of Cuban Wilfredo Lam, both of whom travelled from Marseilles to Martinique together with Lévy Strauss²⁶⁹ before he arrived in Brazil to start writing *Tristes Tropiques*. Realism and surrealism reveal here a much-debated aspect of Latin America aesthetic production. The absurdity of the literary “real marvellous”, for example, offers a picture of reality which comes from a baroque influence:

the presentation of the world offered to us by the baroque artist strives to make us feel amazed, moved, by the instances of violent tension that occur and that it holds: landscapes darkened by stormy violence; human figures in ‘fierce postures’; ruins that tell us of the uncontainable destructive force of time upon the solid work of the human being; and violence grasped in its suffering and tenderness, which grants a greater vibrancy to the baroque creation²⁷⁰

Lévy Strauss’ aesthetic choice to define the landscape as a French surrealistic expression reveals a perspective which is unable to see the magical realism (his description is a real marvellous one) as a dread synthesis of typical colonial expression, therefore, miscomprehending also the role of the *picada* as a language that instruct the aesthetics more than the path.

265 Claude Lévy Strauss, *Tristes Tropiques*. *ibid.* p. 262.

266 Claude Lévy Strauss, *ibid.* p. 262.

267 Alejo Carpentier, in his criticism of European surrealism, wrote in the preface of his *Kingdom of this World* that “the unsettling imaginative poverty of a Tanguy, for example, who has spent twenty-five years painting the same stone larvae beneath the same gray sky”. Lois Zamorra & Wendy Faris (Eds.). *Magical Realism Theory, History and Community* (Durham: Duke University Press, 2005) p. 85.

268 The *sertão* is representative of not only the interior of the country, but refers also to a mode of living, a landscape and a metonymic agent for social, cultural and natural life. Here, I chose ‘back-lands’ as the term to refer to it from the English translation of João Guimarães Rosa’s “Grande Sertão Veredas”: *The Devil to Pay in the Backlands* trans by James L. Taylor & Harriet de Onis (New York: Knopf, 1963).

269 See: Eugenio F. Granell. ‘A aventura surrealista nas antilhas’. In *Surrealismo e Novo Mundo* (Porto Alegre: Editora da Universidade UFRGS, 1999) pp. 203 - 214.

270 José Antonio Maravall, *Culture of the Baroque: Analysis of a historical structure*. (Minneapolis: University of Minnesota Press, 1986) p. 210.

Derrida, conceiving the *picada* as “the essential confrontation that opens up communication between peoples and cultures”,²⁷¹ describes it as a “writing”:

the possibility of the road and of difference, the history of writing and the history of the road, of the rupture, of the *via rupta*, of the path that is broken, beaten, *fracta*, of the space of reversibility and of repetition traced by the opening, the divergent from, and the violent spacing, of nature, of the natural, savage, salvage, forest.²⁷²

Derrida questions the case of raising proper names as a problem which distinguishes the theoretical discussion from empirical affect and the violation and disturbance conducted by the ethnologist who would inscribe what is proper to him, provoking the “loss of what has never taken place”.²⁷³ The question of naming will be also addressed in chapter 3 as a Catholic operation of colonization.

In both cases, culture as well as landscape are seen as separate spheres. In Levy Strauss, the *picada* is taken as a recognizable anomaly within the terrain which reinforces the “wasteland” whereas the culture of the *Nhambiquara* is taken as violated and disturbed by the line. For Derrida, the violation is made by the anthropologist which uses, without noticing it, a “violent spacing” to obliterate what is the proper writing belonging to the Indians. The *picada*, as a trail and a trace, is commonly used by inland population to cross through jungles and *selvas*, so it is a necessary technique of the landscape operated by cultures which fulfil and carve this same landscape. Felt dramatically by the indigenous and by poor populations who were promised wealth plus well-being by exploring the territory, the telegraph marks this landscape while carrying with it a political, geographical, economic and aesthetic mark. In the colonial event, the endeavour of a globally clean border-less and bodiless communication was employed in order to demarcate spaces of conquest and conflicts of culture as it became a political construction linked to the symbiotic domination of land and technology.

Technology is neither homogeneous nor participates equally in different social realities. This becomes clearer when we compare situations where the same technology is used and present different consequences. In this case, this thesis points out to distinctions between realities that were established within the context where the rules, regulations and developments of technology were created and realities to which this universe was imported from outside. We note, therefore, that the performance of tactical operations and resistance to the functional order of technology appears more clearly in places where its norms make less sense when confronted by particular political situations.

271 Jacques Derrida. *The Derrida Reader: Writing Performances*, ed. by Julian Wolfreys (Lincoln: University of Nebraska Press, 1998) p. 74.

272 Jacques Derrida. *The Derrida Reader*, *ibid.* p. 74.

273 Jacques Derrida. *The Derrida Reader*. *ibid.* p. 79.

Thus, the method by which we investigate ways in which colonial society views such rules and procedures related to the application of radio technology becomes useful for the argument of this thesis.

Chapter 4 - The Wireless Art of Politics

The critique of the wireless communication universe was born with the emergence of radio as a central tool for the consolidation of the Western political and cultural order. Radio, thus, becomes the initial symbol of a conceptual, technological and political battle over the direction of electronic communications from the beginning of the twentieth century. For its property of carrying technically produced information within its form, radio-waves are fundamentally important spaces of the spectrum's relation to society and to how society creates itself.

The impact of radio has been explored from aesthetic perspectives since its early social use. Some references which point to the political aspect of the electromagnetic phenomenon employed to communication indicate the necessity to frame such ideas from within that techno-aesthetic composition of radio transmission. In the same way, this criticism of the aesthetic form of radio also accompanied a critique of the political economy of media, embodied in the agencies of capitalism such as big media corporations, national and international authorities, the States as well as the managerial and technical order of controlling and handling radio waves.

The relationship between aesthetics and electromagnetism has been studied in the field of science, in relation to the dispute between functionality and beauty of the equations that translated the physical radiation phenomena within the field of wave theory, quantum mechanics and wave-particle relation.²⁷⁴ Notably, Jonathan Sterne and Douglas Kahn have written about the impact of energy, electromagnetic radiation and wave behaviour related to sound studies. The work of Greek artist and sculpture Takis (Panagiotis Vassilakis) has explored the perceptual aspects of the invisible energy and its relation to space, objects, movements and sounds. The architect Lebbeus Woods explored the air and electromagnetism in a fluid relation with constructs. The occupation of the air, the role of wireless technology and architecture are present in projects such as Einstein's Tomb, Aerial Paris and the Aeroliving Labs, in which forms and objects are seen floating in the air, as an "architecture suspended in an invisible matrix of air and charge".²⁷⁵ In this sort of "architecture of energy", which aims to make visible that which cannot be seen, Lebbeus claims that "Architecture, traditionally, is the anti-fluid, or rather it is a primary form of resistance to the flux and flow of air

274 Within this fields, Arthur I. Miller discusses the relation between scientific language and artistic beauty, arguing that art and science share common principles and techniques which would eventually "blur or even obliterate the distinction" between them as their language approach to each other. He initiates allocating "beauty" and "science" in separated fields and quoting Steven Weinberg to claim that equations are some long lasting and potentially beautiful pieces of scientific knowledge. Arthur I. Miller. 'A Thing of Beauty'. New Scientist, Issue 2537, 4th of February, 2006

275 M. Sorkin, *Architecture Rising: Lebbeus Woods' Paris Project*. Quoted from: Anthony Dunne. Hertzian Tales. (Cambridge: MIT Press, 2005) p103.

and water, creating fixed points in their turbulence”,²⁷⁶ arguing for an “architecture that moves (...) from place to place”.

In Latin America, the movement that connected radio-waves and aesthetics more blatantly, was the Mexican Movimiento Estridentista (“Stridentist” Movement). It appeared a decade after the Mexican revolution, the first of the 20th century, and it was influenced by its drive to overcome the tradition, Mexico’s semi-feudal past and the decay of its old institutions. Influenced by Futurism, Dadaism, Cubism and Spanish Ultraism in the arts, as well as the Russian Revolution in politics, the *estridentismo* carried a particular taste for urbanization and electrification.²⁷⁷ In 1921 Maples Arce, the movement founder, releases the manifesto “Actual n.1” and in 1923 the magazine “Irradiador” (irradiator) is published. In this same year, for the occasion of the inauguration of “El Universal” radio station, Maples Arce conceives a poem exclusively to be broadcasted by the station. The work, called T.H.S. *Telegrafía sin hilos* (W.L.T. - Wireless telegraphy), is the first literary text to be emitted through radio waves in Mexico²⁷⁸ and considered by the author the first poem ever to be written by an avant-garde movement which “reflects a bit the environment of uneasiness and interest awakened by radiophony”.²⁷⁹ The poem emphasizes the airy aspects of radio transmission through mentions of stars which throw programs, the mercurial moon which barked for the horizons, the solitude as a balloon, and the “The insomniac antennas of recollection [which] collect the wireless messages of some frayed farewell”.

Luis Quintanilla, another *estridentista*, published a book of poems entitled Radio: Wireless Poem in Thirteen Messages.²⁸⁰ The modern fascination with technology engendered aesthetic and avant-garde explorations into the theme of radio and its airy, celestial, energetic and subjective aspect as well as its modern, electric and technical appearance. The invisibility revealed by technology, accompanied of a perspective of a radical change in forms and messages, took radio and its universe to a level of prime object for aesthetic creation. Radio was particularly important

276 Lebbeus Woods, ‘Fluid Space’, 2009. Available at <<https://lebbeuswoods.wordpress.com/2009/06/28/fluid-space/>> Accessed in 07/2017.

277 On the frenzy provoked by radio in many aspects of Mexican life in the 20’ and the fundamental role of estridentista aesthetics, see: Rubén Gallo, ‘A Loucura do Rádio: Aventuras da telefonia sem fio no México dos anos 20’, in: Remate de Males (n.25(2), jul-dez), 2005.

278 The poem can be listened in Spanish as if it were the original transmission through the work of Miguel Molina Alarcon here:< <https://soundcloud.com/miguelmolinaalarcon/tsh-el-poema-de-la-radiofonia-1923-de-manuel-maples-arce>>.

279 Quoted from: Ruben Gallo, ‘Poesía sin hilos: Radio y Vanguardia’, *Revista Iberoamericana*, (V. LXXIII, N. 221, Octubre-Diciembre), 2007. pp 827-842. p 830.

280 Kyn Taniya (Trans: David Shook), *Wireless Poem in Thirteen Messages*. (Rochesterm Cardboard House Press, 2016).

for the estridentistas, which “fueron los únicos poetas de vanguardia en el mundo hispanoamericano que lograron ‘asimilar’ la radiofonía a la literatura”.²⁸¹

The intention of this chapter is to briefly explore some relevant views about radio as an element which sparked conceptions of political action and aesthetic experiences. As interesting as they are, the main theories produced around radio in the twentieth century have not explored it in terms of an alternative epistemology which contributes to peripheral perspectives. Instead, they were developed around Western views over the arts, social transformation and political visions on how the radio spectrum should be managed. This part is thought to present a literary review on the production of important figures in the field of media and the arts who have touched upon radio in order to support or give meaning to their analysis. The readings follow a line which ends up in the formulation of the ideas for “Free Radios”, the experience which will better illustrate the combination between aesthetics and politics, as well as a more profound debate on the meaning of the spectrum, freedom of speech, critique of regulatory marks and battles against the instituted norms for telecommunications.

The political, theoretical, technical and aesthetic notations of the lines examined below reveal a conceptual path towards the connections of such arenas. However, since most theories depict radio as a technical tool which has in the spectrum a complementary support to spark its political and artistic capabilities, my critique goes in the direction that it is not that aesthetics can be explored in, by or from radio, but instead, that the electromagnetic spectrum itself carries an open aesthetic and political property which sets up a political battlefield according to the place, time, social reality and conceptualization that a group has about it. Such a battlefield, in turn, does more than reveal a restriction of spectrum usage; it appears as a conflict for the control of expression, perception and sensible meaning. The most immediate and adjacent arena of that social struggle around the EMS is the space occupied by radio waves.

The radio case study examined in this chapter is the Brazilian *Rádio Muda*, station in which I was involved with from 1998 to 2004, in order to demonstrate how the legal arguments around interference, spectrum scarcity and clandestine broadcasting have to deal with a censorship of aesthetic expressions and alternative modes of organization more than they do regarding technical assemblages and judicial frameworks.

281 Rúben Gallo, ‘Radiovanguardia: poesía estridentista y radiofonía’, In, *Ficciones de los medios en la periferia. . Técnicas de comunicación en la literatura hispanoamericana moderna*. Eds. Wolfran Nitsch, Matei Chihaiia, and Alejandra Torres. (Berlin, Koln, 2008) p279.

Aesthetic and Political Radio Criticism

The initial political criticism towards the managerial, technical and economic constituents of the radio environment comes from artistic perceptions. On the impact of radio technology to hearing, German artist Rudolph Arnheim writes that “Wireless inclines much more to such a stylised, abstract verbal art than the theatre, however unnaturalistic”.²⁸² He lists a number of characteristics contained in radio which offer an elevated stimulus for aesthetic perception. Exploring technically and artistically the possibilities for radio plays, monologues, concerts, dialogues, sound effects and others, he juxtaposes an aesthetic theory of wireless technology with artistic techniques and communicational psychology. He is credited as the first to classify radio as a “means of expression” instead of a means of transmission or communication, adding, in the introduction of his book *Radio*, that “The results of the (...) experiments with this new form of expression can only be called sensational”.²⁸³ He praises radio as an art form that has no immediate link with the visual, being “independent of anything corporeal”.²⁸⁴ On the sensory and aesthetic features of wireless, Arnheim points out that “The ‘expressive characteristics’ of sound affect us in a far more direct way (...) by means of intensity, pitch, interval, rhythm and tempi, properties of sound which have very little to do with the objective meaning of the word or the sound”.²⁸⁵ For Arnheim, the artistic exploration of an “apparatus whose technical peculiarity simply consists in enabling sounds made at a particular spot to be simultaneously reproduced in as many and as far removed places”, would intensify an aesthetic perception by breaking the borders of “class and country” and creating a “spiritual event of primary importance”.²⁸⁶

Arnheim relates the wireless phenomenon with the form and motion of invisible waves, including the mechanical ones responsible for the acoustic sound. As they are both “invisible” sensuous expressions, they correlate in relation to their effect on human sensibility and combine to foster the privileged experience of hearing:

In wireless the sounds and voices of reality claimed relationship with the poetic word and the musical note; sounds born of earth and those born of the spirit found each other; and so music entered the material world, the world enveloped itself in music, and reality, newly created by thought in all its intensity, presented itself much more directly, objectively and concretely than on printed paper: what hitherto had only been thought or described now appeared materialised, as a corporeal actuality.²⁸⁷

282 Rudolph Arnheim, *Radio* (London: Faber and Faber Ltd., 1936) p. 152.

283 Rudolph Arnheim, *Radio*, *ibid.* p. 15.

284 Rudolph Arnheim, *Radio*, *ibid.* p. 15.

285 Rudolph Arnheim, *Radio*, *ibid.* p. 29.

286 Rudolph Arnheim, *Radio*, *ibid.* p. 226.

287 Rudolph Arnheim, *Radio*, *ibid.* p. 15.

Here the faculty of invisibility provides “sounds born of earth and spirit” to connect the poetic world together with the material one as a concrete and direct corporeal sense celebrated as a “praise of blindness”.²⁸⁸

Space is also considered by Arnheim as an element of differentiation specific to the wireless phenomena. While a concert hall is restrained by its walls and a visual imperative, thus imposing a perception²⁸⁹ on sound, space and actors, wireless communication withdraws the possibility of “seeing” the music, enhancing imagination as well as forcing the listener to “include the surrounding space in his impression of the music” and construct by himself the environment of what has been transmitted: “By abolishing any notions of a real space the subjective awareness of the acoustic space can develop unchecked”.²⁹⁰ Radio here appears again as a synaesthetic creation and free imaginative production of spaces and images. Its obligation to spark imagination makes oneself to create and produce novel perceptions allocating oneself in a different environment.

Hearing without seeing is one of the features which gave radio its enormous ability to social mobilization, especially in the twentieth century. The fantastic property of spreading image-less messages across wide spaces triggers imaginations, creations, admirations, curiosities and passions over this very space in which radio dwells. This leads us to a dialectic of the space particularly constructed by the waves, for while the spectrum fulfils and encompasses everything, it also transforms the given notions and perceptions of the “real space” through those sensuous feelings. As if multiple spaces could collide and dispute with a façade, in a sort of baroque movement in and out from the levels of materiality and spirituality, omnipresence and locality, reality and imagination, the subject of wireless is presented to a synaesthetic experience of inhabitation:

the blind listener scales the heights with the melody, plunges into the depths, is carried over an abyss on the bridge of a counter-movement; now he feels he is in a gripping, thrilling region of power, now he is alone in the void with whimpering cries. Now space is crowded with the most bewildering polyphony, now everything moves in block formation; now space is torn by discord, by simultaneous but unrelated sounds.²⁹¹

The first figure to present a political theory of radio which became popular in the European left-wing political discussions was Bertold Brecht. The German poet, writer, theatre director and practitioner drew his “radio theory” stating that

288 Arnheim writes that “The eye alone gives a very complete picture of the world, but the ear alone gives an incomplete one” the essence of broadcasting consists just in the fact that it alone offers unity by aural means (...) in affording the essence of an event, a process of thought, a representation”. Rudolph Arnheim, *Radio*, *ibid.* p. 135.

289 “The sight of the musician, the performing instrument, contributes nothing to the music, and even disturbs its character; in the first place, because if you watch the process of playing at the same time, you get the impression that not the music but the human figure is the chief and central feature”. Rudolph Arnheim, *Radio*, *ibid.* p. 144.

290 Rudolph Arnheim, *Radio*, *ibid.* p. 149.

291 Rudolph Arnheim, *Radio*, *ibid.* p. 147.

radio is one-sided when it should be two. It is purely an apparatus for distribution, for mere sharing out. (...) The radio would be the finest possible communication apparatus in public life, (...) if it knew how to receive as well as to transmit, how to let the listener speak as well as hear, how to bring him into a relationship instead of isolating him.²⁹²

Brecht proposed a public communication, with intense popular participation in political life arguing that the restriction for its political use was not due to the technical apparatus but was imposed by the political tendency which governed the media structure. An important characteristic of Brecht's ideas on Radio is that of "instruction". Since the radio apparatus needs the public, and without it, it would have nothing to say, radio "must be taught to speak by the public, a public interested in realizing its publicness, its distinctly public character, by using the invention of the radio to document and intervene within daily life."²⁹³ This refunctionalization or reordering of radio comes as a pedagogical process, as Mowitt reminds,²⁹⁴ anticipating some Latin American cultural and philosophical movements of popular empowerment through pedagogical practical experiences, such as Augusto Boal's "Theatre of the oppressed" or Paulo Freire's "Liberation Pedagogy". As a project "at once political and aesthetic, of (...) re: working of radio",²⁹⁵ Brecht's pedagogical proposition is drawn in relation to his perspectives about the role of the arts in society and, in this sense, as "the apparatus in relation to which the articulation of politics, here specifically Marxism, and philosophy is lived".²⁹⁶

We have seen that the status of the nation-states in the passage from the nineteenth to the twentieth century marked the distributions of responsibility to organize, use and divide the radio space. The European States determined the primacy of their communication over other players when it came to regulation and infrastructure of transmission. Even though it is hardly possible to charge for electromagnetic reception (the baroque lack of contention of waves), the public aspect of radio – as a monopoly of the State – was politically enforced since its early stages. The inheritance of a medium "invented" by imperial nations, although it served for its expansionist and economic gains, defined the spectrum with the condition of a 'public good' which remains up to this day, as it says the definition of ITU: "a scarce, but renewable public resource (...) not confined within national borders".²⁹⁷ European states kept the original model of a State-owned media until very recently.²⁹⁸

292 Bertold Brecht, 'The radio as an Apparatus of Communication', in Neil Strauss & Dave Mandl, *RadioText(e)* (Durham: Duke University Press, 1995)

293 John Mowitt, *Radio: Essays in bad reception* (London: University of California Press, 2011) p. 61.

294 John Mowitt, *Radio: Essays in bad reception*, *ibid.* p. 62.

295 John Mowitt, *Radio: Essays in bad reception*, *ibid.* p. 62.

296 John Mowitt, *Radio: Essays in bad reception*, *ibid.* p. 76.

297 Website of the International Telecommunication Union. Available at: <https://www.itu.int/en/Pages/>

298 "Up to that time (1960) commercial radio as practiced in USA was barely known in Europe". Erwin S. Strauss, 'Pirate Radio Pirates', in *RadioText(e)*, *ibid.* p. 123.

It was this situation of State monopoly in Europe which triggered the Free Radio movement, starting in the early 1970s “in the context of material and subjective emancipation struggles (...) as a reaction to a certain abstract utopia from the 60s”.²⁹⁹ In this sense, Free Radios emerge from the civil disobedience against the monopoly of the States over the radio spectrum and contrary to the modes of commercial and bureaucratic management of media technologies. Such criticism appeared in the form of aesthetic experimentalism, amateurism, the denial of formalism and cleanness of radio language and alternative collective assemblages to manage the stations. They also entailed a certain optimism with the technological advancement of the media revolution towards a “post-media” era.

The history of unlicensed radio emission in Europe has a landmark in Radio Caroline, a radio station constructed on a boat³⁰⁰ that was conceived and financed by Ronan O’Rahilly and Alan Crawford. Aware of the BBC service monopoly and aiming to reach a youth interested in new forms of popular expression, they started to transmit from international waters at the United Kingdom’s coast in order not to abide by national legislation. That is the origin of the depreciative term “pirate” to refer to an unlicensed emission of radio waves, curiously coined by an empire which funded and profited a lot from barely-legal overseas private activities in colonial times. This contradiction inspired the Brazilian *Cooperativa dos Rádio-Amantes* which, responding to the derogative label of pirates and highlighting the not-for-profit character of free radios, wrote in their manifesto that “They are the pirates. It isn’t us after the gold”.³⁰¹

For Hanz Magnus Enzensberger, the 1968 movements in Paris represented not only that “abstract utopia” mentioned by Guattari but also demonstrated a “reversion to archaic forms of production”, since he, vexed, mentions that “It was not the radio headquarters that were seized by the rebels, but the Odéon Theatre, steeped in tradition”.³⁰² As representative of the Frankfurtian Critical Theory, in a text of 1962, Enzensberger writes that the enlightenment is the philosophical presupposition of all consciousness industry (translated into English as the ‘industrialization of mind’), a term which designs a “social product” created by the “mediations, secondary and tertiary deviation” of what it multiplies and sells, becoming a “key instance of modern society”.³⁰³ He

299 Felix Guattari, ‘As rádios livres em direção a uma era pós midiática’, in Arlindo Machado, Caio Magri & Marcelo Masagão, *Rádios Livres: A reforma agrária no ar* (São Paulo: ed. Brasiliense, 1978) pp. 10 – 12.

300 “Radio studios had been built on the upper decks behind the ships bridge. In the hold were A.C. generators connected to two 10KW medium wave (AM) broadcast transmitters. The combined power from these was fed to a tall aerial tower near the bow of the ship.” Peter Moore, ‘Caroline’s history’. Available at: <http://www.radiocaroline.co.uk/#history/history_part_2.html>

301 Arlindo Machado and others, *Rádios Livres*, *ibid.* p. 22.

302 Hans Magnus Enzensberger, ‘Constituents of a Theory of the Media’, in *Critical Essays* (New York: Continuum, 1982) p. 53.

303 Hans Magnus Enzensberger, ‘Constituents of a Theory of the Media’, *ibid.* p. 45.

identifies four conditions for the existence of this industrialization of mind: philosophical enlightenment, political modernity, primary accumulation and industrial technology. Aware of the importance of electronic media in capitalist societies, he defines it as “the pacesetter for the social and economic development of societies in the late industrial age [that] infiltrates into all other sectors of production, takes over more and more directional and control functions, and determines the standard of the prevailing technology”.³⁰⁴

Arguing that a socialist theory of media should be one of acting inside the contradictions between productive forces and relations of production of electronic technology, he criticizes the European left and its attitude of “fear or surrender” in relation to the manipulative aspects of this industry. He positively classifies new communication technologies as anti-sectarian, dirty, emancipatory, mobilizer, reproducible, open to mass participation and egalitarian in their technical structure: the inequality of media appropriation would refer to the contradiction intrinsic to a capitalist economy. The social “collective and organized efforts” combining with the possibilities of limitless expression of the masses opened by the decentralized and collective constitution of electronic media would allow subversive spaces for the transformation of society. This political potential is propitiated by his view of a common “pure” form in electronic technology and its media. Since there is a technical indistinction between receiver and transmitter, such media has an “egalitarian structure”³⁰⁵ and aside from the capitalist economic relations of production, nothing else would be inherent or particular to its technical apparatus.

From that idea of an open and advanced manipulative technology, he foresees the impossibility of mass surveillance or “total control” by electronic media, for this would lead to “an embolism” and a “deliberate industrial regression”.³⁰⁶ His affirmations of the impossibility of media being accumulative, concentrated or to be auctioned is also debatable from the fact that there are today gigantic prices in electromagnetic spectrum auctions determined by the high value and accumulation of not only the medium itself, but also personal data. He also sees the elimination of heritage and intellectual property as an inevitable consequence of the electronic media against the “class-specific handing-on of non-material capital”.³⁰⁷

Nonetheless, Enzensberger presents examples of uses of media in spaces outside the ‘developed world’ to illustrate how “direct mobilizing potentialities of the media become still clearer when they are consciously used for subversive ends”.³⁰⁸ He talks about the examples of

304 Hans Magnus Enzensberger, ‘Constituents of a Theory of the Media’, *ibid.* p. 46.

305 Hans Magnus Enzensberger, ‘Constituents of a Theory of the Media’, *ibid.* p. 50.

306 Hans Magnus Enzensberger, ‘Constituents of a Theory of the Media’, *ibid.* p. 50.

307 Hans Magnus Enzensberger, ‘Constituents of a Theory of the Media’, *ibid.* p. 56.

308 Hans Magnus Enzensberger, ‘Constituents of a Theory of the Media’, *ibid.* p. 63.

“Free Radio Algeria”, as recorded by Fanon, the use of radio in the Cuban revolution and the central role of publicity in the actions of Uruguayan Tupamaru movement. He refers to the recognition, by “American imperialism”, of the dangerous political menace of the spread of electronic communication in Latin America by saying that the USA attempted “to meet the ‘revolution of rising expectations’ in Latin America (...) by scattering its own transmitters all over the continent and into the remotest regions of the Amazon basin, and by distributing single-frequency transistors to the native population”.³⁰⁹ Radio Sutatenza, explored in the next chapter, established many partnerships with the USA industry, the UN along with the high ranks of the Catholic church. It expanded its audience by distributing single-frequency radio receivers to the peasants, justifying the absence of a dial with the argument that the pieces would be cheaper and would consume less power from the attached battery. Although we do not know if he was talking about Sutatenza, we do consider such ‘conquering’ aspects when problematizing the role of the radio.

Enzensberger praised Walter Benjamin’s construction around the reproducibility of the work of art, which consisted of the argument that technique detaches the object from the domain of tradition and reactivates the reproduction, thus, liquidating the universe of the heritage of its cultural value. The mechanical reproduction, i.e. the evolution of the means of production in the field of artistic creation, would emancipate the work of art from its “parasitical dependence on ritual”³¹⁰ and starts to be based in political practice, making the old “artistic function” merely incidental. Based in the centrality of the modern conditions of production, Enzensberger argues for the “Destruction of the standards of aesthetic theory” by defending new techniques of media manipulation, the increasing indistinctness between documentary and fiction and “demanding” a perspective of arts which sees no separate object from the system it creates: The media “do not produce such objects. They create programs. Their production is in the nature of a process”.³¹¹ The interaction demanded by electronic media structures would “outworn” radio, TV and film monologues. For this to happen, the “media program” as a political agenda should “be thought of not as means of consumption but as means of their own production.”³¹²

Although Enzensberger criticizes the “cultural industry” as elaborated by the critical theory, he is influenced by it in ambivalent ways. Alongside Adorno and Horkheimer, he treats the media system as a uniform integrated system and frames the birth of his “consciousness industry” as a process of enlightenment. But he attacks the “nostalgia that clings to early bourgeois media” present in the authors of “Dialectic of Enlightenment”.

309 Hans Magnus Enzensberger, ‘Constituents of a Theory of the Media’, *ibid.* p. 63.

310 Walter Benjamin, Quoted from Hans Magnus Enzensberger, *ibid.* p. 69.

311 Enzensberger, ‘Constituents of a Theory of the Media’, *ibid.* p. 74.

312 Enzensberger, ‘Constituents of a Theory of the Media’, *ibid.* p. 75.

For the Frankfurt School, the means of communication form an integrated system, that combines and synthesises modern rationality, political economy and cultural industry. This diagnostic is related to the European societal, philosophical, political and economic condition of the first half of the twentieth century. The challenge was to interpret as well as explain the effects of a series of technical apparatus and their impact on politics, society and culture from within the theoretical tools available at the time. Marxism was the main framework to draw such interventions as it was intercalated with Weberian interpretative sociology and his remarks on instrumental and technological rationality which gave birth to a particular capitalist ethics.

Walter Benjamin seemed to have less pleasure than political obligation to work on and in radio, as explained by Wolfgang Hagen.³¹³ His connections with, in his words, “nasty radio matters”, can be also related to his friendship with Brecht, for his artistic preference were clearly for theatre, photography and cinema, as noted by John Mowitt.³¹⁴ Adorno presupposes that the status of things for the “cultural industry” is in large account due to a technological rationale that appeared with the growing specialization and secularization of the world.³¹⁵ Contrary to the idea that any form of singularization could be attained through radio, for Adorno, the main aspects of the medium would be standardization and homogenization. He is not interested in the language of the medium or its potentialities, although he indicates a possible change in radio structure from the role of the listeners searching for some individuality in relation to the object (surfing the dial or tuning it) and from possible “atomistic listening” where focus and attention would foster particular sensibilities from a direct relation to radio. However, the core of his analysis is the radio reception of “good” music (centred on Beethoven’s 9th symphony), its transformation into a commodity and its ideological tendencies to alienation. Due to his perception of radio as a mass medium explored in industrially-developed society, he perceives a radio which withdraws a communal aspect of listening and experiencing (its *hic et nunc*). Thus, the very idea of community, peripheral and political radio is unthinkable in Adorno’s scheme.

Herbert Marcuse, confronting the hegemonic Marxist perspective over the transformative condition of arts and aesthetics in society, interprets that Marx envisioned and imagined a new

313 Wolfgang Hage, ‘On the Minute: Benjamin’s silent work for the German radio’, Talk presented at *Eye or Ear: Walter Benjamin on Optical and Acoustical Media* (Berlin: 2006) Available at: <http://www.whagen.de/vortraege/2006/20061201Benjamin/OnTheMinute.pdf>, Accessed in 18 July 2014.

314 John Mowitt, *Radio*, *ibid.* pp. 63-76.

315 See: T. W. Adorno. ‘A social critique of radio music’, in *The Kenyon Review* (Gambier: vol.7, n.2, 1945), pp. 229-235); _____ ‘The Radio Symphony’, in P. Lazarsfeld and F. N. Stanton (Eds.) (New York: Radio Research: The Popular Music Industry, Arno, 1941); _____ ‘On Popular Music’, in S. Frith and A. Godwin (Eds.) *On Record, Rock Pop and the Written Word* (London: Routledge, 2000).

condition “qualitatively different from all preceding societies”.³¹⁶ Marcuse’s perspective moves towards the making of a “more humane” society, contrarily to the condition imposed to us by capitalist political economy. In this sense, aesthetics would be able to communicate what cannot be expressed in regular form. Aesthetics is, thus, a rupture of senses which is reflected in uses, practices and perceptions of reality, being both “accusation of the existing society and images of liberation”.³¹⁷ In a lecture from 1968, Marcuse states very directly that “The idea of reason, the rationality which permeated the established universe of discourse and behaviour can no longer serve as guide, is no longer qualified to define the goals and possibilities of human endeavour, of human morality, of human science, of social organization, of political action”³¹⁸. In an optimistic phase of his life, he is drawing on interrelated aspects of radical politics, industrial society and aesthetics curiously, calling for a *desublimation of culture* in its conservative and archaic aspects. This period marks the beginning of his turn into studies of aesthetics and expressions as forms capable of politically transforming the society into a work of art, as opposed to the “establishment” of either the capitalist industrial society or the bureaucratic socialists’ examples at the time. To spark political revolt in the sense of integrating society as a work of art is to deny the art form of such societies and create a new one, based on imagination and sensibility. The established society, he writes, “has devised forms of control which counteract liberation at its very roots (...) in the expression and communication of his needs, thoughts, and feelings.”³¹⁹ Much earlier, his colleague Walter Benjamin had already praised the surrealist project of necessity for energies of “intoxication” to the fulfilment of the demands of the *Communist Manifesto*, saying that “we penetrate the mystery only to the degree that we recognize it in the everyday world, by virtue of a dialectical optic that perceives the everyday as impenetrable, the impenetrable as everyday”.³²⁰

Even with such an effort to conceptualize and theorize electronic media, radio remained more or less hidden from either the positive views about the mechanic end electric reproducibility (although recording devices and the phonograph industry reproduces, radio itself is made of unrepeated flows, which, albeit it might emit repeated content, are never made from the same matter) as well as from the catastrophic diagnosis of the “society of spectacle”,³²¹ the “hyperrealism

316 Herbert Marcuse. [Video] Herbert Marcuse and the Frankfurt School (1977). Interview to Bryan Magee. Available at: <<https://www.youtube.com/watch?v=vm3euZS5nLo&t=2115s>>. Accessed in 22 July, 2017.

317 Herbert Marcuse, *ibid.*

318 Herbert Marcuse, ‘Beyond One-Dimensional Man’, in *Collected Papers of Herbert Marcuse, Vol 2 Towards a Critical Theory of Society*, ed. by Douglas Kellner (London: Routledge, 2001) p. 117.

319 Herbert Marcuse, ‘Beyond One-Dimensional Man’, *ibid.* p. 118.

320 Walter Benjamin, ‘Surrealism The Last Snapshot of the European Intelligentsia’, in *Walter Benjamin – Selected Writings, 1927-1930* (Cambridge: Harvard University Press, 2005) p. 216.

321 Guy Debord, *Society of Spectacle*, trans. by Ken Knabb (London: AK Press, 2002).

of simulation”,³²² and the “society of control”.³²³ Those conceptualizations have in common the computational, numerical and interconnected visual images, codes, scenes and assemblages, whereas radio is still thought of a singular medium, seen either an “alternative” or “old”, perennially accompanying the words “television” and “films”, as if they were part of the same previous regime: potentially totalitarian, analogue, vertically structured, one-sided, invisible and poor. While those mid twentieth-century media analytic frameworks point out for *new forms of domination* based in transformations of signifier, technical structures, status of the visible, spatial control as it proposes new relationships between subject and object, private and public, commodity and significance, radio, on the other hand, has been subject to studies related to mass media industrial complex, such as reception studies, audience behaviour, economic and technical constructions as well as an appendix for popular mass culture.

Free Radios

Assuming the vital importance of media for economic, political and subjective oppression, the free radio movements abides by the idea that radio can serve as means for subjectivity production. Reaching to a voice which “escapes from domination of a social-cultural economy, from the organization of reason, the mandatory escolarization, from the power of an elite, and, foremost, from the control of enlighten consciousness”,³²⁴ free radios sought distance from commercial and industrial modes of production to prioritize amateurism, collective forms of appropriation of the material and symbolic means of production and resistance to restrictions to free speech in legal domain. The political approach of unconventional radios was set up by the French and Italian free radios of the 1970s, enforcing a position that distances them both from capitalist market and from institutional forms of governing: making free radio would be like “a word finally found (...) plausible to invert the official information and make another true to be heard, free from money and power”.³²⁵

Not interested in consumer/audience studies not even in strategies of communication, marketing and propaganda or the approach that puts radio as a “creative industry” or as cultural

322 Jean Baudrillard. *Selected Writings*, ed. by Mark Poster, (Sanford: Stanford University Press, 2002).

323 Gilles Deleuze. ‘Postscript on the societies of control’ in *October* (vol. 59, The MIT Press, 1992). Available at: <<https://www.jstor.org/stable/778828?seq=1>>

324 Michel de Certeau, *A Invenção do Cotidiano: Artes de Fazer*, (Petrópolis: Vozes, 1990).

325 Collectif radios libres populaires, *Les radio Libre*. (Paris: Petite collection Maspero, 1, 1978). Trans. by Thiago Novaes & Raphael Maureau, ‘As Rádios Livres’. Available at: <<http://estudiolivres.org/tiki-index.php?page=LesradiosLibres&bl>> Accessed in 14/11/2013.

entrepreneurship, radio appears here, above all, as a matter of play: “When people are happy together, it becomes subversive behaviour”.³²⁶

This is where a relation to aesthetics emanates: an experience of immediate relation with an “activity that has no end other than itself, that does not intend to gain any effective power over things or persons”.³²⁷ This does not mean an absent political and ethic objective, but an aesthetically different mode of structuring they ways by which another locus for communication becomes viable. It is not the instruction, but the actual challenging practice which would make its politics emerge. It is also not their role in mediation or its capability of mobilization, but the fact that free radios “are not a forum or an alternative; it’s a goal in itself”,³²⁸ which would give them political and subjective potential for transformation.

Félix Guattari fits free radios within the notion of flight lines and collectives assemblages of enunciation.³²⁹ As a sort of adaptation from the ideas from Brecht and Enzensberger about the potential use of radio, the free radio movement adds late modern influences about the value of individuality and identity (in opposition to the two main global political systems of the seventies), a sort of postmodern language, the idea of civil disobedience³³⁰ against the constituted monopoly and the primacy and value of production of subjectivity against “molar” structures as a vortex to change the functioning logic of industrial societies.

In a book written with the Brazilian scholar Suely Rolnik, one reads in the first paragraph that the “concept of Culture is extremely reactionary” for the reason that it separates “semiotic activities (activities of orientation in the social and cosmic world) in a series of spheres”. In a critique of Western forms of culture rationalization, Guattari affirms that cultural manifestations, “Once isolated, (...) are standardized, potentially or practically instituted and capitalized by the dominant mode of semiotization; that is, are split from its political realities”.³³¹ Developing his criticism of “Culture”, Guattari divides the concept in three: “Culture-Value”, meaning the early idea of

326 This phrase appears loose and in italic on a preface written by Felix Guattari for a book about radio Alice, one of the most politically engaged free radios of Italy. See: Felix Guattari, ‘Millions and Millions of Potential Alices’, in *Molecular Revolution: Psychiatry and Politics* (New York: Penguin, 1980, pp. 236 – 41) p. 240.

327 Jacques Ranciere, *Aesthetics and its Discontents* (Cambridge: Polity Press, 2009). p. 30.

328 Geert Lovink, ‘The theory of Mixing: An inventory of free radio techniques in Amsterdam’, in *Radiotext(e)*, ibid. p. 115.

329 Felix Guattari, *Plan sobre el planeta. Capitalismo mundial integrado y revoluciones moleculares* (Madrid: Traficantes de Sueños, 2004) p. 53.

330 See: Percy Bysshe Shelley, *The Masque of Anarchy*. (London: Edward Moxon, 1832) Available at <http://www.archive.org/stream/masqueanarchyap00huntgoog#page/n6/mode/2up>>; Henry David Thoreau, *On the Duty of Civil Disobedience*. (Gutenberg Ebook, 2004) Available at <http://www.gutenberg.org/files/71/71-h/71-h.htm>>; Critical Art Ensemble, *Electronic Civil Disobedience & Other Unpopular Ideas* (Anti-Copyright, 1996) Available at <http://www.critical-art.net/books/ecd/>>

331 Felix Guattari & Suely Rolnik, *Micropolíticas. Cartografías del Deseo* (Madrid: Traficantes de sueños, 2006), p. 100.

cultivating, in which some have culture, and some have not; “Culture-Collective-Soul” as analogue of civilization and thrived by cultural Anthropology as a mode to qualify modes of subjectivation by the attempt to “run out of ethnocentrism” which ended up multiplying it; and “Culture Commodity” as an undifferentiated conglomerate of apparatus and objects which reproduces values through cultural goods involved in quantification and management either from the market which reproduces it, or from the institution that engenders it (multilateral organs, governments, institutionalized cultural centres).

In contrast to this ‘cultural’ aspect, free radios as media are about “finding another use (...) of making speak minor voices (...), promoting a certain type of creation that could not happen in any other place”.³³² An important element to notice is that, for Guattari, the agent of this process of singularization is always connected with “marginalities”, “minorities” and “abstract machines”: prostitutes, criminals, primitives, crazy people, and children would be examples of “most creative and elaborated abstract machines”.³³³ That is the reason for the strong connection of the free radio movement with the anti-asylum movement, sex worker demands, feminist policies, and other “new social movements” connected to identitarianism and branches of anarchism. Free radio would then encounter the claim for decoloniality in the form of identifying those on the margin of pre-formatted yet hegemonic modes of thinking and behaving, giving them “voice” to defy the very norm that allocates them in such places.

As an epistemic alternative for this reactionary conception of culture, Guattari proposes an “ethico-aesthetic paradigm” which is based on the inseparability of creative spheres from “social life and the outside world” contrarily to a “techno-scientific” paradigm in which a “simulacrum of the imaginary of power, has the job of overcoding all the other Universes of value”.³³⁴ By its turn, this new aesthetic paradigm acts as an ethico-political one by “a constant renewal of aesthetic boundaries, scientific apparatuses of partial observation, philosophical conceptual montages and the establishment of ‘habitats’ (oikos) that are political”. The aesthetic aspect is here connected to a function of creativity which “engenders unprecedented, unforeseen and unthinkable qualities of being.”³³⁵

This aesthetic element applied to a political ethos and an epistemic alternative against “transcendent autonomised pole of reference” represented by the “truth of logical idealities, the Good of moral will, the Law of public space, the Capital of economic exchangism, the beautiful of

332 Felix Guattari & Suely Rolnik, *Micropolíticas*, *ibid.* p. 125.

333 Felix Guattari & Suely Rolnik, *Micropolíticas*, *ibid.* p. 361.

334 Felix Guattari, *Chaosmosis: an ethico-aesthetic paradigm* (Indianapolis: Indiana University Press, 1995), pp. 104-105.

335 Felix Guattari, *Chaosmosis*, *ibid.* p. 106.

the aesthetic domain” and the dualisms which recur to “homogenetic instances” such as “God, Being, Absolute Spirit, Energy, The signifier”, provide, for the sake of this thesis, a mode to relate the aesthetics as a political element participative in epistemic creations over the spectrum. Thus, this “aestheticized space” created by “autopoietic machines” interferes in the state of things and unfolds possible qualities by a sensible connection between material and immaterial and internal and external, as a sort of baroque elaboration.

From there comes the notion of a chaosmosis as an ethical new aesthetic paradigm as “a force for seizing the creative potentiality at the root of sensible finitude (...) ‘before’ it is applied to works, philosophical concepts, scientific functions and mental and social objects”³³⁶ Its ethical and political implications contains the responsibility of the creative instance with regard to the thing created, the inflection into the state of things and the opening of bifurcations in established schemas of thought. Free Radio is therefore conceived by such conceptualization as “autopoietic machines” which defies the capitalist signifier in an aestheticized space. Here, radio, but furthermore, the spectrum-machine, can be thought of as a potential savage “vibratory position” which aesthetically embraces and meshes objects, animals, nature and things as it interferes in the order and spaces of complexity:

An initial chaomic folding consists in making the powers of chaos co-exist with those of the highest complexity. It is by a continuous coming-and-going at an infinite speed that the multiplicities of entities differentiate into ontologically heterogeneous complexions and become chaotised in abolishing their figural diversity and by homogenising themselves within the same being-non-being. In a way, they never stop diving into an umbilical chaotic zone where they lose their extrinsic references and coordinates, but from where they can re-emerge invested with new charges of complexity.³³⁷

Such an amateur, marginal, clandestine and experimental ethico-aesthetic project of radio elaborated in the second half of the twentieth century is what guided the activities of Rádio Muda. The radio here does not represent only ‘media’ or any sort of small-scale entrepreneurship of communication, but a laboratory of technical, aesthetic and political sensibility. Such freedom and autonomy over the many aspects which comprise the making of radio requires the creation of a perspective on how to express and talk about its composites. Besides its sonic raw material, its judicial along with its political strategies of defence and technical equipment, the curiosity and intellectual elaboration over its fundamental viability and central infrastructure of its existence, the electromagnetic spectrum, is also something that is required in order to promote politics of radio from an anti-colonial perspective.

336 Felix Guattari, *Chaosmosis*, ibid. p. 112.

337 Felix Guattari, *Chaosmosis*, ibid. pp. 110-111.

Community Radio

The practice of radio broadcasting without license or authorization from the State is as old as the division of functions and services for its use.³³⁸ Since the 1930s there has been documentation of radio emissions which infringe the territorial and legal limits to which they were officially circumscribed. The technical evolution and the social conditions that allows FM transmission made technicians, curious and amateurs to start carrying out experiments with such type of broadcast.³³⁹ The technical characteristics make the transmission in FM to allow smaller equipment for broadcasting, which, despite reaching a more restricted area than AM transmissions, could carry more information within its wave and therefore a better sound quality. This evolution of radio is what sparks the interest of political movements, artistic perceptions, civil society organizations and private businesses in the field of broadcasting. To regulate these uses, the national agencies responsible for telecommunications in a given country assign spaces for specific services in accordance with the standards established by the ITU.

In the Brazilian case, the Constitution of 1988 gives to the State the responsibility for granting and renewing concessions for spectrum use, observing the principle of complementarity between public, private and State services. Even so, it was only 10 years after the promulgation of the constitution that a law was established regulating community broadcasting service. The Law n. 9612 from 1998 establishes the community broadcasting service allowing a maximum of 25Watts ERP of power, antenna maximum height of thirty meters and establishes that the station has to be linked to a non-profit civil society association. Its articles 22nd and 23rd establish that these stations cannot count on “protection against possible interference caused by any regularly installed Telecommunications or Radio Broadcasting Services” and, if there is interference coming from the community station, “the Granting Authority will determine the correction of the operation and, if the interference is not eliminated, within the stipulated period, it will determine the interruption of the service”.³⁴⁰ Thus, the law establishes community broadcasting as a less relevant service than the others, which, adding the amateur, communal and precarious aspects, lack of resources and technical knowledge, makes it very difficult to regularize and maintain many stations of this type of service.

There are contradictions between the restriction imposed on the use of spectrum for the emission of radio waves and constitutional prerogatives related to freedom of speech. Notably, the

338 See: Christopher H. Sterling, Cary O’Dell (Eds.), *The concise Encyclopedia of American Radio* (New York: Routledge, 2010).

339 See: Gary L. Frost, *Incremental Technology in Twentieth Century America* (Baltimore: The John Hopkins University Press, 2010).

340 Brazil. Act 9612/1998. http://www.planalto.gov.br/ccivil_03/LEIS/L9612.htm

fifth article of the constitution says that “the expression of intellectual, artistic, scientific and communication activity is free, regardless of censorship or license” and article 220, on “Social Communication”, states that “The manifestation of thought, creation, expression and information, in any form, process or vehicle, will not be subject to any restrictions, under the provisions of this Constitution”. It also mandates that “§1. No law will contain mechanisms that could constitute an embarrassment to the full freedom of journalistic information in any media, observing the provisions of art. 5º IV, V, X, XIII and XIV ” and that “§ 2. Any censorship of political, ideological and artistic nature is prohibited”. In this way, even though the legal framework presents a principled panorama affirming artistic freedom and expression of thought, the political, economic, legal, bureaucratic and regulatory procedures contributes to prolong the inequality of access to radio waves.

It is from this restrictive reality, supervised by the State but designed by private and corporate powers, that radio movements take a critical stance in relation to the administrative status of radio waves. In addition to the legal and regulatory justifications for the persecution and impediment of their transmissions, based on the ideas of spectrum scarcity (inherited from the perception of the spectrum as a limited natural resource) and interference, there is also a strong aesthetic component which strengthens these political mandates of States and regulatory bodies.

While community radio has an institutional role – albeit small – within the legal order that regulates the spectrum, and seeks to reproduce the technical and aesthetic models of traditional forms of transmission (voice-over model, traditional program format, and the relevance of the audience) free radios have their most notable features in decentralized forms of organization, civil disobedience and aesthetic experimentation.

The case of Rádio Muda, below, demonstrates how is the connection between these two aspects and how the social and spatial features influence in the outcome of this particular social experience.

The Radio Mute

*Rádio Muda*³⁴¹ was an unlicensed small-scale free radio³⁴² located at the bottom of a water tower in the central square of the campus of the State University of Campinas (UNICAMP). In the records³⁴³ of a civil and criminal investigation aimed to halt its activities, one reads a declaration from an ANATEL³⁴⁴ agent affirming that the emission of its radio waves is an “evident disdain to the constituted powers (...) [which] defies the judicial order”, adding that “as in every case in which it is vilified, the State must respond as to ensure its own existence and social cohesion”.³⁴⁵ The processes against the radio are based on the Act 9.472/1997 which states that anyone who “develops telecommunication activities clandestinely”³⁴⁶ could face up to eight years of detention.

Dating back to the mid-1980s, *Rádio Muda* was born as a tool to support the movement for public estates for students from outside Campinas who were admitted by the university. The first transmitter was assembled by engineering students and it served in its first moments as a nomadic, unlicensed, clandestine, alternative, self-managed independent media in a period when Brazil was coming out from the military dictatorship. The *TABA*³⁴⁷ movement rose in the aftermath of a State intervention which, after causing political turmoil for almost 2 years, formally ended when

341 The name *Rádio Muda* refers to three different meanings in Portuguese: the third person of the present tense of the verb *mudar* (to change), the feminine form of adjective “muted” and also the piece of grown plant that can be transplanted in order to breed another individual plant of the same kind, as a type of clone. Here, the “muted” meaning in the title refers to the fact that the radio ended up shut down by authorities.

342 The concept of free radio was born in Italy and France in the early 1970s to define experimental, independent stations which broadcast outside the margins of the law in order to defy the monopoly of the States in the use of radio frequencies. See: Ron Sakolsky, Stephen Dunifer (Eds.), *Seizing the Air Waves: A Free Radio Handbook*. (San Francisco: AK Press, 1998); Lawrence C. Soley, *Free Radio: Electronic Civil Disobedience* (Boulder: Westview Press, 1999); Jean Bénétière and Jacques Soncin, *Au cœur des radios libres* (Paris: L’Harmattan, 1989); Daina Agaitus and Dan Lander (Eds), *Radio Rethink: Art, Sound and Transmissions* (Banff, BC: Banff Centre for the Arts, 1994); Zeke Teflon, *The Complete Manual of Pirate Radio* (Tucson: See Sharp Press, 1993); Felix Guattari, ‘Popular Free Radio’, in Neil Strauss; Allen Weiss (Eds.) *Radiotext(e)*, *ibid*.

343 I have access to 2 legal processes which, combined, form a documentation of more than 1000 pages collecting all authorities’ communication and judicial procedures from 2007 to 2014. For the sake of preservation of the defendants, names, processes and quotes will not be specified, since it is an ongoing investigation. The PDFs will be hence identified as “Investigation documentation” followed by the page number of the electronic document. The documentation, nonetheless is a beautiful report on the radio activities, resistance and stories. They picture the waste of time and resources from public authorities of Brazil in a task seeking to shut down a local radio as well as the bureaucracy involved, showed in the vast number of dispatches, envoys, endeavours, processing, redistributions and stamps, which demonstrates the political patrimonial motifs that are behind the irrational persecution towards free and community radios, all under the regulation based in the lack of authorization and spectrum scarcity and interference as it is demonstrated in the process.

344 The Brazilian national agency of telecommunication, created in 1997 by the General Law of Telecommunications (9.472/1997), is the first independent regulatory agency of the country, which was part of the process of reformulation of telecommunications after the privatization of the sector in 1995.

345 Investigation documentation, p. 39.

346 Brazilian General Law of Telecommunication, Chapter II, Articles 183 and 184.

347 In Tupi, Taba (*tawa*) means indigenous village, *aldeia* in Portuguese. News reports and documentation of the period is available at the *Acervo Histórico do Arquivo Central* (Siarq) – Unicamp. The weblog “Fratura Exposta” has a collection of testimonies and pictures from TABA. See: <<https://shasca.blogspot.com.br/>>

Professor Paulo Freire,³⁴⁸ candidate from the opposition and winner of the university general election³⁴⁹ of 1981, was impeded from assuming the position of UNICAMP's warden.³⁵⁰ One of the demands during this period was that student houses should be constructed and offered for free for students with less familiar income.

From 1991 – after a brief period when the transmitter was used by the Student Union – it began to assume itself as a “free radio”, independent from any institutional political force within the university. A memo from April 1993 (fig.4) from the so called “Free Radio Open Collective of Unicamp Students” addressed to the “Representative Council of Units”, says that the meeting of the collective decided not to accept the council's competence over the radio, presenting the radio as an “independent entity”. Reinforcing the possibility of dialogue and inviting people to be part of its “open collective”, the letter asks that any discussions regarding the radio should be removed from the agenda meeting. Thus, it decreed its independence from representative bodies that were alien to its internal and open collective. Even so, in the minutes of the meeting of August 14, 1994, it is also verified that “The Rádio Muda will be open only to Unicamp students” even though outsiders with partnerships with students or the ones who already had a reserved time in the previous Semester were also allowed. Two years after, the radio became open for anyone in the community.

348 Paulo Freire was a celebrated educator, philosopher and politician who developed a critical pedagogy connected to the literacy of poor population and related to the broader movement of liberation on Latin America. See: Paulo Freire, *Pedagogy of the Oppressed*, trans. by Myra Bergman Ramos (New York: Bloomsbury Academic, 2018).

349 At the dusk of the military dictatorship, in 1981, the Governor of São Paulo declared an intervention at UNICAMP, halting the process of electing directly the warden and faculty directors. A series of authoritarian measures were taken to fire professors and intervene in student and workers organizations throughout one year, when in April 1982, the warden suspended the intervention. See: Tânia Maria Granzotto. *Movimento De Funcionários E Docentes Da Unicamp Entre 1978 E 2000*. Unicamp, (2015). Available at:

<<http://repositorio.unicamp.br/jspui/handle/REPOSIP/119646>>; and *Intervenção – 1981*. (2015) Acervo Histórico do Arquivo Central da UNICAMP. Available at: <<https://www.expo50anos.unicamp.br/9/unidade/49/intervencao>>

350 See: Terceiro reitor é escolhido em clima de conflagração, in *Jornal da Unicamp*. Available at: <http://www.unicamp.br/unicamp/unicamp_hoje/ju/julho2006/ju331pag6-7.html> Accessed in 31/08/2018.

Campinas, 22 de abril de 1993

Do Coletivo Aberto de Rádio-Livre das Estudantes da UNICAMP
Ao Conselho de Representantes de Unidades.

Caros Centros Acadêmicos, Representantes e DCE reunidos,

Vimos por meio desta prestar respeito a esta casa, deixar votos de que alcancemos o fortalecimento e a democratização tanto almejado e, também, informar-vos que, em reunião realizada nesta quinta-feira 19 de abril, nós, o Coletivo Aberto de Rádio-Livre dos Estudantes da UNICAMP, não consideramos pertinente e de competência deste Conselho, enquanto entidade independente, impor posições a serem tomadas em assuntos da "Rádio Muda". Consideramos tais decisões de interesse dos que convivem com a realidade do projeto, isto é, o Coletivo.

Fig:4 Memo from April 1993 from the "Free Radio Open Collective of Unicamp Students" to the "Representative Council of Units" of the State University of Campinas. Personal archive. Photo by the author.

In the same minute there is an annotation about the discussion over a "statute" to be made for the radio. Due to the precarious situation in legal and regulatory terms and its "horizontal" and collaborative characteristic, internal organization and rights and duties, responsibilities and principles were always issues that arose at meetings. From time to time the idea of a semi-institutionalization came up and the forms and models for that were discussed. The intent was to maintain the collective administration (lack of) structure, self-management and freedom of content, but with some institutional tools, such as an academic study group at the University, a research center or a civil association under which the radio could exist. In a document from the mid-1990s, there is a proposition for a division in areas such as finance, events, communication, technical matters and "administration", which was the only one that contained a handwriting note, asking "What is this?" (fig.5). With the responsibility of making proposals for a "conscious and free" radio, the collective has always been the final decision-making body of all processes. In addition to operational issues such as cleaning, door keys, technical maintenance and the radio collection, the document shows the intention of carrying out communication plans, the production of informative material and the events to be held throughout that year.

Projeto MUDA

Objetivo

Tornar a Rádio Muda *Orgão, Núcleo de Estudos e Laboratório de Comunicação da Unicamp*; criar um mecanismo de AUTO-GESTÃO para Rádio; formar estatuto.

Propostas

I. *Organização do Pensamento Coletivo*

a) Formação de Grupos-diretores como apoio nas áreas de:

finanças
} administração } - O que é ?
eventos
comunicação
técnica/estúdio

Esses *Grupos* devem juntos criar condições de realização das propostas de uma Rádio Consciente e Livre. Os *Grupos* devem discutir entre si os projetos de cada área para então apresentá-los ao Coletivo. O **Coletivo** aprova ou veta os projetos através do voto. Cada *Grupo* deve apresentar ao menos UM projeto por semestre

Fig: 5 “Muda Project”. Draft of a project. Circa 1994. Personal archive. Photo by the author.

The document that had the most enduring life as guideline for conduct on the radio were the *Princípios Mudos* (muted principles), elaborated at that same time and fixed on the radio walls until at least the mid-2000s. They are eight simple principles that guided the behavior and attitudes in the studio as an accepted and commonly shared policy. It declares that the radio “does not run advertisement”, “works in a self-managed way”, offers freedom of content under the responsibility

of “the good sense of each programmer” and recommends “distance from commercial media shows” (fig.6).

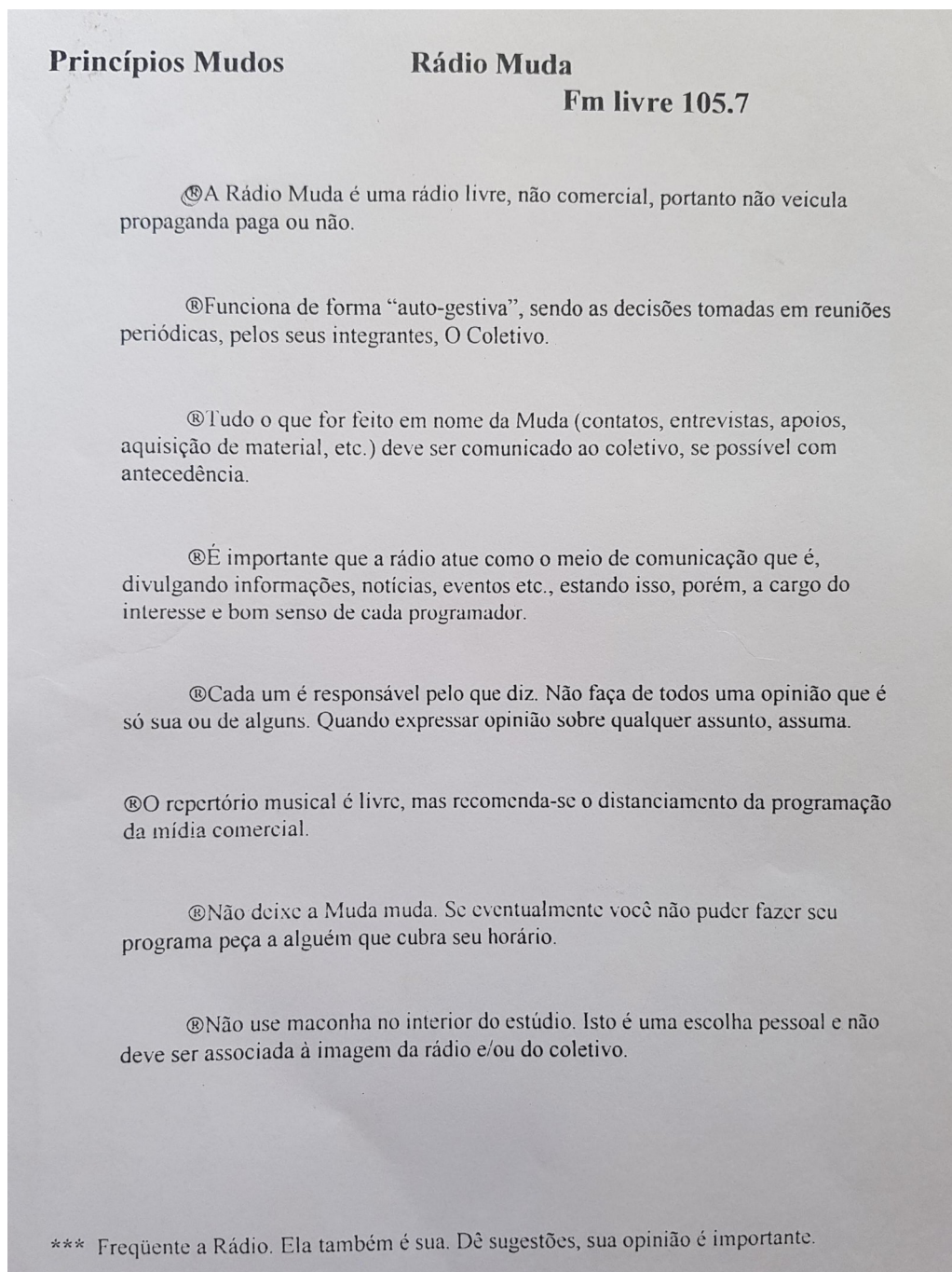


Fig: 6 “Princípios Mudos”. List of principles of Rádio Muda. Circa 1994. Personal archive. Photo by the author.

From that time until recently, it has hosted a number of cultural events, campaigns, free concerts and parties, being fundamental for the universe of the social movement of culture and communication during the first decade of the twenty-first century. The radio was present at the three

first editions of the World Social Forum in Porto Alegre, helped to create the free radio network,³⁵¹ offered workshops and courses on free radio construction and harvested a partnership with many social movements and activists in Brazil and Latin America. In its technological innovation aspect, it was one of the first radios in Brazil to have a website (1995), the first radio to broadcast via streaming on free software (2001) and hosted the first independent trial of digital television in Brazil (2011). At the peak of its activities, between the mid-1990s and the mid-2000s, the radio kept about from 40 to 60 programs that covered the entire day with original programming (fig.7).

In December 2000, the first page of the culture section of the main newspaper on Campinas stamped the title “Alternativa FM”³⁵² (FM Alternative) for an article about *Rádio Muda* and the debate “Alternative Practices in Radio Broadcasting - Community and Free Radios”, to be held at Unicamp in that same day. Alongside the photo with members of the radio, a text contains information such as the location (“the arena theater in the center square of Unicamp”), the open characteristics of its collective, the number of programmers (“about 100”), information about the debate and a box about what is it and how to set up a free radio. In September 2001, a radio programmer, student at the University, was invited to debate in a session of the CIENTEC Exhibition for Science and Technology Development,³⁵³ “an event that brings together the main research institutions in Campinas and the region and is mobilizing hundreds of people in your organization and hopes to attract close to 100,000 visitors”. The *Jornal da Unicamp*, the university’s official communication vehicle, covered the debate table on a full page in its September 2001 edition and described the reaction of the president of the *Padre Anchieta* Foundation (entity responsible for the largest public broadcaster in Brazil - *TV Cultura*), as “Sincerely impressed by the arguments presented by members of *Rádio Muda*”, noting that “it is necessary to defend even piracy, as long as it is aimed at defending a public function”.³⁵⁴

351 Fruit of a partnership between free radios and the indymedia centre of Brazil, in 2002 the free radio network was created through a Drupal website, allowing participations of many experiences over the country.
<<http://radiolivres.org>>

352 *Jornal Correio Popular*, Caderno C, ‘Alternativa FM’ (Campinas: 14/12/2000).

353 *Jornal da Unicamp*, A Terceira categoria de mídia. Campinas (Year 15, n.166, Sep 2001) p.41. Available at <https://www.unicamp.br/unicamp_hoje/jornalPDF/JU_0166.pdf>

354 *Jornal da Unicamp*, ‘A Terceira categoria de mídia’, *ibid*.

Rádio Muda 105,7MHz - Programação

Atualizada da 09/09/96

	Segunda	Terça	Quarta	Quinta	Sexta	Sábado	Domingo
8:00		Eu Amo William Blake*	Márcia Bahiana	O Primeiro do Dia			
9:00	Heide*	Rádio Chita	Moda na Muda*	Julião*			
10:00	Nessie's Bubbles	Aidan*	Julião*	Nessie's Bubbles	Érica	Hora do Sol	
12:00	Zabrazul	Medicine Léa*	Mosaico	No Sé se te Molesto con esta Serenata	Show Papa-Légua*	Rosebud*	Hora do Rush*
13:00	Digestivo	Bom Dia Antropóides	Muchachos de La Playa	Anestesia*	Seria se Fosse	Véia Banguela	Véia Banguela
15:00	Sono		Blue 8*	Can't Find My Way Home*	Coma Berenices		Pará
17:00	Provisório			Sandro	Rádio Atividade	Nitroglicerina*	Condenados*
18:00	Rep. dos Camarões	Pateudeus*	THC				
19:30	Programa do Bozo	De Cabeça pro A.*	Quem Matou Charlie Brown?*	Ari Basko	Sister Morphine*		
20:00	HeartSoul	O Poderoso Benetton	Cachaça	Aqui Jazz Flutebol	O Clube da Criança Junkie		
21:00	Fire						
22:00	Cosme e Darnião	Hatui II - A Vingança	Moska	Hatui II - A Vingança	Dino		
00:00	Sandro		Sandro*	Time Stand Still			

* Para mais programação vá 1609/96

Apoios: DCE, CAMECC, CACH, CAB, CALL, CAIA

Rádio Muda na Internet: <http://www.fcc.unicamp.br/~muda>

Grade de Horários

PROGRAMA	TERÇA	QUARTA	QUINTA	SEXTA	SÁBADO	DOMINGO
1	10:00	10:00	10:00	10:00	10:00	10:00
2	11:00	11:00	11:00	11:00	11:00	11:00
3	12:00	12:00	12:00	12:00	12:00	12:00
4	13:00	13:00	13:00	13:00	13:00	13:00
5	14:00	14:00	14:00	14:00	14:00	14:00
6	15:00	15:00	15:00	15:00	15:00	15:00
7	16:00	16:00	16:00	16:00	16:00	16:00
8	17:00	17:00	17:00	17:00	17:00	17:00
9	18:00	18:00	18:00	18:00	18:00	18:00
10	19:00	19:00	19:00	19:00	19:00	19:00
11	20:00	20:00	20:00	20:00	20:00	20:00
12	21:00	21:00	21:00	21:00	21:00	21:00
13	22:00	22:00	22:00	22:00	22:00	22:00
14	23:00	23:00	23:00	23:00	23:00	23:00
15	00:00	00:00	00:00	00:00	00:00	00:00

A participação na rádio é aberta a qualquer um!
 Entre em contato conosco através do e-mail:
 Ou compareça nas reuniões semanais às segundas-feiras 18.00
 no IFCH, sala 09, na UNICAMP.
 Ou visite o estúdio na caixa d'água da praça do Ciclo-Básico
 (em frente ao teatro-de-arena) na UNICAMP.

Usamos uma caneta que funciona. Para que t...
18/11

DATA	IN	OUT	PROGRAMA	EQUIP.	ASS
17/11	12:00	14:00	JAHAROM HELL	MICROPHONE + CD	W/Car
18/11	15:40	17:00	CHOCOLATE	VINYL CD	Nathans*
19/11	17:00		bauchinho B&B		
20/11	1:00	2:10	MRB	OK	COOVEL
21/11	07:XX	03:	Pipo	OK	TA, T...
22/11	16:00	17:00	Pod'Pod	OK	Ca. Pe. Jo.
23/11	17:00	18:00	Pod'Pod	OK	AFUAZIO
24/11	19:00	20:30	Pod'Pod	OK	AFUAZIO
25/11	19:00	20:30	Pod'Pod	OK	AFUAZIO
26/11	22:00		TAPA BURACOS	OK	Summ
27/11	24:XX	XX:XX	CHOCOLATE	OK	CHOCOL
28/11	21:00	23:30	CHOCOLATE	OK	CHOCOL
29/11	19:00	19:00	JAMAICA	OK	CHOCOL
30/11	21:30	21:30	COOVEL F*	OK	CHOCOL
			MICROPHONE*		
22/11	9:30	12:00	BULL DOCTOR	TAPE/CD	Matheus
23/11	15:00	16:00	BASTENIA	TAPE/CD	FROST
24/11	16:00	18:00	Handbook		Bico
25/11	18:00	19:00	WETGRUDS		Kan
26/11	19:00	21:00	WETGRUDS		TA
27/11	21:XX	22:XX	Pipe	OK	TA
28/11	22:00	23:00	LOS FUNERALES DE LA MAMA GRANDE		Tudo
29/11	23:00	24:XX	LOS FUNERALES DE LA MAMA GRANDE		Tudo
30/11			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
1/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
2/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
3/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
4/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
5/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
6/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
7/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
8/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
9/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
10/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
11/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
12/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
13/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
14/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
15/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
16/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
17/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
18/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
19/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
20/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
21/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
22/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
23/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
24/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
25/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
26/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
27/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
28/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
29/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		
30/12			PARA UM DRAGAO CADA ORGASMO É UMA MORTE		

← QUE RESPOSTA HEIN??

Fig: 7 Program Schedule for the Rádio Muda from 1996 and 2000 plus 2 pages of the attendance book from 2001. Personal archive. Photo by the author.

Later that year, the newspaper *Folha de São Paulo*, reported that the “Federal Police spotted a clandestine radio at Unicamp”³⁵⁵ also describing the site and frequency of the station, besides reporting that the station is on the air since 1991 from 8AM to 2AM and has approximately 70 different radio shows. For there was no transmission being made at the moment that the ANATEL agents visited the radio, the seizure of equipment was not possible. The reporter also questioned the

355 *Folha de São Paulo*, ‘PF flagra rádio clandestina na Unicamp’. (Caderno Campinas, 2/11/2001), p. C3.

administration of the university, which responded that Unicamp “has no connection with the radio and had no knowledge about it”.³⁵⁶

On the wide-ranging reports of traditional media outlets, two characteristics were constantly reinforced. On the one hand, the news emphasized the open character, the cultural relevance and the conceptual and academic contribution that the radio and its programmers gave to the public debate. On the other hand, news circulated about attempts to shut down the radio, illegalities committed and judicial disputes.

From the news of the first type, we find pieces about the radio’s participation in the editions of the World Social Forum, including a published article about its activities in the magazine *Caros Amigos* (Dear Friends),³⁵⁷ one of the most relevant progressive publications of the period. On January 19, 2003, a report by the newspaper *Correio Popular* about the radio’s participation on the third World Social Forum, after offering the reader the location of the radio and its frequency, announces that the radio will also broadcast its signal through the “Internet, via streaming system, which allows the public from all over the world to listen to the broadcast”.³⁵⁸ The same newspaper had published a note in the previous year about the radio’s participation in the 2002 Forum: “the objective is to show the ‘ease and necessity’ of making radio inexpensively and democratically”.³⁵⁹

Local papers, academic and student magazines and alternative publications produced several articles on free radio, debates on regulation of communications, freedom of expression and aesthetic formats based on the radio’s experience (Fig.8). During this period, *Rádio Muda* promoted workshops and training in free radio and free software, featured as location for a children’s book by Renato Tapajós,³⁶⁰ participated in academic, political and civil society debates, carried out musical, academic³⁶¹ and aesthetic research, in addition to organize parties and cultural events of great magnitude.

356 Folha de São Paulo. ‘PF flagra rádio clandestina na Unicamp’. *ibid.*

357 *Caros Amigos*, ‘Edição Especial Fórum Social Mundial’ (São Paulo: Casa Amarela, March 2001).

358 *Correio Popular*, ‘Rádio Muda transmite Fórum Mundial ao Vivo’ (*Caderno Cidades*, Campinas: 19/01/2003). p. 11.

359 *Correio Popular*, ‘Rádio Muda transmite Fórum Social de Porto Alegre’, (*Caderno Cidades*, Campinas, 01/02/2002) p. 7.

360 Renato Tapajós. *Rádio Muda*. (São Paulo: Sinal aberto Ática, 2003).

361 *Rádio Muda* has been subject for analytical investigations in different fields. For Anthropology, see Flora Rodrigues Gonçalves, *Rádios Livres: As controvérsias ainda pairam no ar? Uma análise antropológica das novas relações sociais de radiodifusão* (Belo Horizonte: Master Dissertation, UFMG, 2013); for Health studies, see Danilo Moreira Marques, et al. ‘A dimensão do rádio no campo da saúde mental: A experiência da rádio ondas mentais online’ in *Cadernos Brasileiros de Saúde Mental* (Florianópolis: vol.8, n.20, pp.101-113, 2016); and sociology, see Cristiane Dias Andreotti, *O movimento das rádios livres e comunitárias e a democratização dos meios de comunicação no Brasil*. (Campinas: Master’s Dissertation, IFCH, 2004).



Fig: 8 Fanzine covers from Rádio Muta from 1995 to 2002. Personal archive. Photo by the author.

On the other hand, the news were also about clandestine activities and the students' resistance against the attempts to close down the radio. Always highlighting the location and frequency of the station, such news reports informed its characteristic of being unlicensed and the questioning of students and programmers against the authorities' official arguments.³⁶² Soon after an intervention and attempt to silence the radio by ANATEL on the first of October of 2002 (the most publicized action to date), the newspaper *Correio Popular* published again a front page article in the culture section about the radio. The article narrates the attempt of the agency to close *Rádio Muda*, offered a history of its activities, describes the characteristics of the radio (age, location, transmission power, political and organizational principles, partnerships) and notes in ironic tone that, despite all this, the radio has an illegal status. After reporting that "more than 80 students blocked access to the radio's entrance", the piece gives voice to a member of the collective who defends the radio's legitimacy. The report also listens to ANATEL representatives who explain that the process would be returned to the judge, who could decide for a new seizure order "with a larger police force". Furthermore, says the agency's representative, "The radio is illegal. There is no authorization granted for the use of radio frequency", no matter "what importance a clandestine radio has in the community".³⁶³

On another page, in the article entitled *Rádio Livre*, the newspaper presents a text narrating the history of the radio and presenting the defense arguments against the operations used by its members. Federal Police chief Armando Celho Neto – a supporter of free and community broadcasting – after quoting the aforementioned article 220 of the federal constitution, adds that the absence of "social reproval" and the principle of legal insignificance, "which is the fact that a radio that has a transmitter of up to 60W of power, cannot pose a threat to commercial radio".³⁶⁴ The report also reproduces an excerpt from the radio manifest released after the closing attempt, in which one reads:

The initiative is legal from the point of view of the Brazilian Constitution, the 1969 San José Costa Rica agreement and the Universal Declaration of Human Rights. (...) The broadcasting activity cannot be classified by itself as a crime. Civil disobedience is therefore necessary.³⁶⁵

The role of disseminating the conceptual, political and legal principles of the radio was disseminated through its written, graphic, academic and sound production. Mostly in the form of

362 See: Folha de São Paulo, 'PF flagra rádio clandestina na Unicamp', *ibid.*; Folha de São Paulo, 'Estudantes querem rádio no ar' (Caderno Campinas, 02/10/2002) p. C3.; *Correio Popular*, 'Alunos da Unicamp impedem fechamento da Rádio Muda' (Campinas: Caderno Cidades, 02/10/2002), p. 1.

363 *Correio Popular*, 'Uma onda no ar' (Campinas: Caderno C, 05/10/2002), p. 1.

364 *Correio Popular*. 'Rádio Livre', (Campinas: Caderno C, 05/10/2002), p. C8.

365 *Correio Popular*. 'Rádio Livre', *ibid.* p. C8.

fanzines, pamphlets and posters, the written communiqués followed DIY aesthetics of alternative media from previous decades.³⁶⁶ This type of marginal and experimental expression was also used in the content of the programs, which in addition to interviews, information and music, brought sound and artistic experimentations³⁶⁷ into the radio for almost 15 years.

Rádio Muda's also nurtured the participation of its members in the digital arena. Aside from its protagonism in relation to its presence on the Internet and streaming service, many members ended up collaborating to public policies in the digital culture universe. However, the story of those works would have to be told in another opportunity.

Interference and Illegality

The documentation of the investigations shows that “since the year 2000, ANATEL, UNICAMP and the Federal Police are attempting to interrupt the functioning of the station without, however, being successful”.³⁶⁸ In October 2002, a joint operation of ANATEL and the Federal Police tried to execute a warrant, but “ahead of the impossibility of access and the absence of representatives”, the police chief in charge halted the mission. Another warrant was released in 2003 and the radio remained monitored by the authorities up to 2006 when they described “a permanent situation of crime, as well as a hostile resistance from the part of the students”. In 2007 a federal prosecutor sent the investigation to the Judiciary Police. Soon after, a federal criminal investigation was installed and a warrant of “search and seizure” was rapidly released. Between 2007 and 2008, the investigation passed on to many sections and departments of judicial and enforcement affairs until February 2009, when a successful action of apprehension of the equipment and closure of the radio was accomplished. Despite being rapidly back on the air, in 2012 the Federal Prosecutor Office released another successful warrant for the seizure of the equipment inside the university campus and in the sixteenth of December the equipment of the radio was again taken by the authorities.

In 2013, the “preparatory procedure” installed by the public prosecutor office of São Paulo and the federal prosecution office of Campinas was turned into a “civil investigation” aimed to halt “the repeated action of the clandestine radio installed within the campus of the State University of Campinas”. When the ANATEL agent asked the *Centre of investigation and prevention of*

366 See: Paulo José O. M. Lara, *Fragmentos das táticas da cultura: técnica e política dos usos de mídia* (Campinas, Master's dissertation, IFCH, 2008). Available at: <<http://repositorio.unicamp.br/jspui/handle/REPOSIP/281424>>

367 Here I use the term in Michel de Certeau's sense, as a language created from laboratories of technical and socio-geographic practices. See: Michel de Certeau, *Culture in plural* (London: University of Minnesota Press, 2001).

368 Investigation documentation, p. 38.

aeronautic accidents (CENIPA) if there have been interferences of the radio in the communications of Campinas' airport, the Air Brigadier, chief of the centre, replied that "there are no records of interferences from Rádio Muda".³⁶⁹ A report of a police mission released in that same year states that "Rádio Muda has no responsible who can be identified", describing the functioning of the radio as an activity "of approximately 250 programmers selected by an assembly who have total freedom to realize their activities" and "manage the radio in anarchic way".³⁷⁰

The first successful operation to shut down the radio is documented in a report from July 2010, where the Federal Police officer narrates in a proud, celebratory tone his achievements of the previous year, boasting himself of having carried out the warrant "in the month of February, when the students were on holiday, and at the early dawn, seeking to achieve success in the action and avoid confrontation with the students".³⁷¹ Earlier in the report, he recalls the failure of the previous operations in which "more than 80 exalted and hostile students gathered around the only entrance of the clandestine radio and impeded the objective of the warrant"³⁷² and that in 2003, "approximately two hundred students gathered in the defence of the radio".³⁷³ Under his command and accompanied by "a Federal Police clerk, 8 Federal Police agents, 2 ANATEL technicians and a hired locksmith",³⁷⁴ plus a team of private security from the university, the authorities were – finally and for the first time since the early 90s, 9 years after the first legal procedure – able to "seize materials and documents to verify the criminal materiality".³⁷⁵

In this execution, the authorities apprehended a lot of equipment from the radio as described in the documentation from ANATEL. Among the electronics and documentations found at the studio (a mixer, an equalizer, a hybrid key, a microcomputer, two tension stabilizers, a microsystem, two vinyl turntables, two CD players, one microphone, cables, notepads and photos), the authorities reported to have found a "tablet of substance (...) with approximately 40g", which was highlighted in the 2010 report with an exclusive paragraph for the achievement, which described "a small portion of the narcotic substance known as marijuana".³⁷⁶ The "vegetable material" was sent to laboratory analysis (where it was submitted to colour test based on Fast Blue Salt B, Chromatography in thin layer and spectroscopy) for confirmation and sent to incineration. The

369 Investigation documentation, p. 29.

370 Investigation documentation, p. 32.

371 Investigation documentation, p. 121.

372 Investigation documentation, p. 120.

373 Investigation documentation, p. 121.

374 Investigation documentation, p. 122.

375 Investigation documentation, p. 122.

376 Investigation documentation, p. 122.

chunk of now “35g of marijuana” was burned alongside 16.000kg of cocaine and tones of other apprehended toxic material in June 2011, two years after its apprehension.

Right after releasing his victorious report, one year after the apprehension, the same officer, from “a search made on the internet”, realized that the radio “was back in full functioning” and, in late 2010 started to insistently ask officially for other diligences to investigate the crime. A series of document exchanges were made for the next six months. Clearly enraged by the return of the radio into the air, the federal police officer, extending the investigation period over and over again, insisted for a new diligence into the studio for a whole year but his requests were apparently received frivolously. When, in September 2011, ANATEL finally visited the campus of the University, its “agents encountered obstacles brought by a group of university students, even going through vexatious situations, which resulted in the non-interruption of the service not granted.” This episode is documented in the video “3x1 Rádio Muda”³⁷⁷ recorded on the day of the agents’ visit. An ironic “wanted” poster was also made, identifying the ANATEL agents as outlaws and asking people to denounce if their vehicle was seen (fig.9).

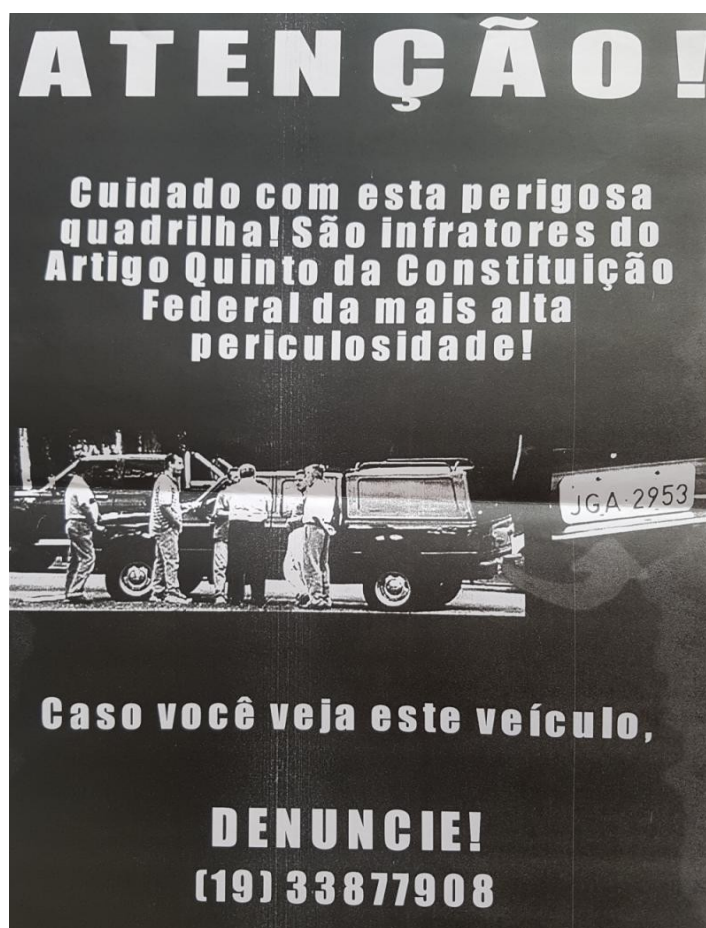


Fig. 9: Poster produced by Rádio Muda. 2011. Personal archive. Photo by the author.

377 3x1 Rádio Muda, YouTube Video. <<https://www.youtube.com/watch?v=OgJa4M4pWac>> Accessed in 31/08/2018.

The formal process of investigation which followed the apprehension of the equipment included an official request of information addressed to UNICAMP in April 2009 from the same police officer (eager to find a name for the criminal responsibility for the 50w emission) where he asks the Warden questions such as: “Is it from the knowledge of UNICAMP that a radio without the concession, permission or authorization operates inside the campus?”; “What was the conditions for the concessions of the radio’s space function at the campus?”; “What were the actions taken by the university to constrain its existence, since its functioning characterizes federal crime?”; and “Who is responsible for the radio?”.³⁷⁸ In an evasive and protocolary manner, the university answered the questions from the police authority, acknowledging that it was aware of the radio’s presence, but denying the assignment of the space (which is correct, since the space was not ceded but occupied in 1991) and also denying their knowledge about those responsible for their maintenance of the station.

In July 2010, the chief of police attached to the process a forensic technical report from the Federal Police’s Nucleus of criminalistics of the Regional Superintendence in the State of São Paulo conducted in November of 2009 “in order to meet the request of Federal Police Delegate Heitor Barbieri Mozardo” who asked the competent authority to examine the radio transmitter in order to obtain answers to the following questions: “What is the nature and characteristics of the material being examined?; What is the frequency and power of operation? Is the material being examined capable of causing radio interference? Other data deemed useful”. It should be noted here the terms and arguments by which the police authority sustains the proof of crime stipulated by the Brazilian legislation. The persecutory argument for criminal evidence is based upon three factors: 1) The technical constitutions and characteristic of the materiality of the electronic equipment, 2) its potential to “illegally” occupy a spatial territory by the use of an unlicensed radio frequency of the electromagnetic spectrum, and 3) the centrality of the notion of a clandestine and unlawful “interference”.

The equipment’s forensic examination which was carried out by two federal criminal officers described the components and dimensions of the transmitter, verified its voltage and certified at which frequency it operated (105,703MHz) and its output power (85W), finally noting “its capacity to transmit FM signals”.³⁷⁹ In the answer to the third question, related to the “interference”, the technicians write that any equipment operating with radio-frequency transmission is, a priori, “capable of emitting undesirable signals outside the normal operating channel”, but attest the conformity of the transmitter with its frequency when it says that it is only “capable of causing

378 Investigation documentation, p. 83.

379 Investigation documentation, p. 115.

interference *at licensed stations operating at the same frequency*". Therefore, the problem here is not a matter of technical unconformity but one of licence absence. The radio members, including many engineering students, had previously verified the frequency of 105.7MHz as free and unoccupied, which is why the transmitter was manufactured precisely in this range. In addition, any interference prejudices the signal reception, so it is unreasonable to place an 85W transmitter over the same frequency as a commercial radio that operates with power 100 times higher, for example. Hence, the report's response deliberately blames the need for technical equipment's licence and homologation (which Rádio Muda had) to justify the argument according to which the rationale of airspace occupation of a small-scale radio in a federal crime. The mindset which criminalizes the emission is, therefore, not a matter of technical discordance or social damage, but grounded on the idea that the electromagnetic spectrum should be controlled, ordered and used under legal, moral, economic and political artificially and historically created conventions:

the transmissions carried out in disorderly manner and without prior study of the frequencies used in the locality in order to avoid interference, may disturb the operation of other radio communication services and radio broadcasting in operation in the region, **compromising the good use of the electromagnetic spectrum.**³⁸⁰

Final Remarks

ANATEL defines the Brazilian radio frequency as a "public good" formed by "the range of the electromagnetic spectrum from 8,3GHz to 3000 GHz where radio communication is possible" as well as a "limited resource" managed by the agency, which observes "the attribution (...) defined in international treaties and agreements, approved by the International Telecommunications Union (ITU)".³⁸¹ Annually, ANATEL releases its "Attribution, destination and distribution plan" of frequencies ranges, destined to regulate "the many services and activities of telecommunication".

Such technical and institutional responsibilities, however, are to a great extent politically determined. Criminal and civil processes such as the one against *Rádio Muda*, for example, begin from a powerful political and economic influence exercised over ANATEL by big commercial players. In June 2000, the São Paulo Association of commercial TV and Radio Broadcasters sent to ANATEL a list of 20 "Pirate radios" with name, frequencies and addresses. A "Unicamp Student Union Radio" was among them. The media monopolistic commercial lobby, paid for by business sponsors as well as exercising a hegemony in terms of setting the pace for cultural, political and economic life of the country, use their influences and resources to list illegal radios and then hand in

380 Investigation documentation, p. 116.

381 ANATEL, *Setor Regulado*. Available at: <http://www.anatel.gov.br/setorregulado/coordenacao-nacional>> Accessed in 31/08/2018.

reports to the national agency. Using justifications based on spectrum scarcity, technical amateurism, interference, and the morality of the law, they are the main force behind the repression against experimental and alternative uses of the spectrum's radio frequencies. Such procedure is confirmed by the record of a meeting from 2013 between Federal prosecutors, ANATEL agents and UNICAMP representatives, including the university warden, in which, after lying about the interference caused by the radio, the ANATEL agent says that the agency "was being pressured by other radios".³⁸²

The legal requirements for spectrum concession for community radios involve a type of bureaucracy, resources, instrumental knowledge and formal organization which blocks many collective and communal socio-cultural formations from accessing the spectrum, and, as consequence, impose a limited view on the spectrum's significance for social struggle. Once a group decides to make use of the spectrum for radio communication without those formal requirements, the risks of losing the equipment, face a judicial battle and suffer from violent pressure from the State and the market are very real.

So, for the case of small-scale radios making a sort of communal use of the radio spectrum, if there is no significant social damage caused by the felony and no evidence of general social interest in shutting down the radio, what causes the constant efforts, the significant public resources employed and the disputable conceptual justifications of the authorities to enforce the law so fiercely? What sort of mentality guides the strict control of the spectrum even in a micro scale such as it is in the case above? What is it that the authorities are really trying to impede by enforcing a silencing norm into the material form of the spectrum? What sort of power and domination are behind the arguments for the control of wireless communication? Why such cultural, economic, political disputes and resistances happen so often and fiercely around radio waves?

In the media archaeology from Western and colonial perspective, it is possible to observe that the ideas of a symmetrical, beautiful, organized and religiously enlightened order is what defines a perfect form of universal communication, as pointed out by the chapters 2 and 3. The radiation of the soul and spirit and the idealistic intellect is what marks the way of thinking that organizes this form of spectral interaction in Western philosophy. This same line of thought is reproduced in colonial imperialism in the form of the nascent radio communication industry. However, the chaotic, elliptical and confused nature of the spectrum's quality, pointed out by Baroque science,

³⁸² Both the ANATEL agent and a Federal prosecutor deliberately lied about the interference of the radio in airport communications (pp. 35 – 38), as can be noted in the report of CENIPA attached to the investigation.

coincides with the expansion of society and the European market, and finds new forms of use and conceptualization.

The theories of media explored in this chapter offer a line of criticism which led to the formalization of alternative or a “Radical Media”.³⁸³ However, from their “locus of enunciation”, such thinkers and theories seems to, at the same time that gives fuel to the construction of a media criticism, obliterate fundamental questions that are related to the condition of coloniality of knowledge. As such, the consequences of the assumption that the radio waves are what they are - being sufficient to think about them from the Western perspective – halts an analysis which considers different subjects and social formations. Built upon a basis which is restricted to particular realities, this media criticism does not cover the problems faced by a large part of the world which stills struggles to make their voices heard. An essential part of which is due to the solid construction of philosophic and scientific presuppositions:

Western philosophy and sciences are able to produce a myth about a truthful universal knowledge that covers up, that is, conceals both the speaker as well as the geo-political and body-political epistemic location of the structures of colonial power/knowledge from which the subject speaks.³⁸⁴

One of Free Radio’s presupposition is to give direct voice for those who are marginalized, making them heard in an “unmediated” form. In the colonial arena, this becomes a more savage, violent and repressive matter. As such, the resistance seems to require new ways of formulating the problems which appear to those movements. This is why it is necessary to examine the core formulation of what came to be the epistemological perception of the function of “wireless” communication. The formulations over the spirit, soul, light and aether would remain present for the future elaboration of the function of what would be discovered and named as electromagnetic spectrum.

This thesis opts to look at colonial relations from a Latin American perspective and the politics of communications from an aesthetic perception. It understands the electromagnetic spectrum as historically and conceptually created as a controlled, framed, and secured space. The meaning constructed over the spectrum, I argue, is connected to a form of colonial epistemic power related to spatial, spiritual, artistic and knowledge institutional control which can be traced back from the early perceptions of the ethereal energy in philosophy to the mind-frame emerged between the sixteenth and seventeenth centuries and accentuated in the passage from the nineteenth to the

383 John Downing, *Mídia Radical: Rebeldia nas comunicações e movimentos sociais* (São Paulo, SENAC, 2002).

384 Ramon Grossfoguel. ‘A Decolonial Approach to Political-Economy: Transmodernity, Border Thinking and Global Coloniality’ in *Epistemologies of Transformation: The Latin American Decolonial Option and its Ramifications*. (Kult 6 Special Issue. Roskilde University, 2009). p. 14.

twentieth century. Nowadays, the repressions are still ongoing, and is noticed particularly in countries which have a colonial history.

Along these lines, a particular form of explaining and exploring the spectrum's form, properties and qualities appeared as a convenient solution to justify and combine an aesthetic romantic vision of technology, a capitalist economic interest in scientific experiments and application, and a colonial task to take over spaces of production and profit. With that base constructed, solidified and undisputed, the criticism of spectrum management, distribution and use was reduced into this inescapable solidified epistemic framework, not only impoverishing but subsuming the discussion over its complex existence, aesthetic expression and political potentialities to matters related to the formal allocation of its spatial distribution towards efficacy.

Far from being the most dramatic case of repression in the universe of illegal media in underdeveloped countries, what can be particularly noticed in the case of Rádio Muda is that combination and appropriation of radical media criticism together with knowledge construction was made from the illegal practice and aesthetic and institutional experimentations. That said, we understand that this colonial perspective, not only enforces the restricted use of the radio waves but, most importantly, appears as a persecution of aesthetic expression which is felt more dramatically in places and occasions where these manifestations do not abide to 'civilized' forms of making radio.

Illegality, scarcity and interference are mechanisms that have a social, economic and cultural meaning, depending on the interests that authorities have and how one observes the function of the radio waves. General media criticism, although they observe the importance of politics in the dispute over the radio waves, do not consider the intellectual and practical framework coming from the periphery, not to mention the absence of questioning the very constructed idea of what the spectrum represents in different societies. Also, we noticed that aesthetics appears as an important force which is fought by the order established for the spectrum and, in a more savage, institutionally fragile and socially dysfunctional places, these is a central battle for the control of expressions and manifestations through the spectrum management.

If, on the one hand, illegal use of the waves leads us to metaphors about the spectrum as a common good, taking us to the conclusion that prohibiting access to it would be like prohibiting access to air, water and land, on the other hand, this view of innate and inanimate "natural resource" is re-enforced. Thus, not only obliterating the living and expressive aspects of the spectrum as a composite force, such vision privileges economic, political and legal agents that are the ones that really represent the domain which historically operate the unequal distribution of such 'natural' elements.

In the next chapter we will examine an example which shows how the domesticated broadcast, even if illegal, can become celebrated and supported by the global order as an educational, civilized and progressive form of broadcast. The clean and aseptic form of Radio Sutatenza, was not only accepted but also encouraged by national and global order (United Nations, large multinational corporations, national governments, civil society), despite being started as an illegal project.

Chapter 5 – Radio’s Colonial Discipline

On October 12, 1931, exactly 439 years after Columbus arrived in the Americas, the monument Christ the Redeemer was inaugurated at the top of the Corcovado mountain (*cor quo vado*, Latin for “Heart, where do I go?”) in Rio de Janeiro. The inauguration day was picked to coincide with the anniversary of the conquest, as it was again in 1955 that the same day was chosen to celebrate *Nossa Senhora Aparecida* (Our Lady of the Apparition), patroness of the nation. From the higher point of the landscape,³⁸⁵ a sculptural image of Jesus watching us all from the mountain indicated the Catholic answer to the Latin interrogation over the direction to where the heart should lead us to. The association between the religious identity with the remembrance of the colonial mission into the Americas was constructed in the form of a cross and posited as the highest summit of the landscape.

At the time of the inauguration ceremony, besides the visible aspect of the concrete lines supervised by political figures, high society members and the clergy, there was also a less visible but yet fundamental spatial element responsible to evidenciate the Christ. The lights of the statue were activated³⁸⁶ from a distance by the use of radio waves:

Marconi had sent out an electric signal from his ship *Electra*, anchored in the bay of Naples, which in its turn has been picked up by a receiver in Dorchester, England, and retransmitted to an antenna on the other side of the Atlantic, in Jacarepaguá in Rio and then sent up to the statue on the top of Corcovado.³⁸⁷

On the 50th anniversary of the statue’s construction, Pope John Paul II was invited to repeat Marconi’s gesture. In a letter written for the occasion, the Pope mentioned the Vatican Radio (managed, in 1931, by Marconi) and celebrated what “at that time seemed miraculous [and] now it seems ordinary”, blessing all of those who “organized this encounter under the ways of the ether”.³⁸⁸ The enlightenment came from a holy and modern land through radio waves in the anniversary of the conquest, providing guidance to the hearts of believers.

The spectrum, present in the ranges of light and radio signals, participated in an event of great social significance, revealing the aesthetic marks of an Art Deco statue characterized by “symmetry,

385 See: Emerson Giumbelli, ‘Brasileiro e Europeu: a construção da nacionalidade em torno do monumento ao Cristo Redentor do Corcovado’ in *Cadernos de Antropologia e Imagem* (Rio de Janeiro: vol.24[1], 2007) pp. 35-63, p. 42.

386 Reports account that the radio signal was too weak to reach the statue, so it had to be amplified by Gustavo Corção, Conservative Catholic, engineer, teacher in telecommunication and journalist who founded a “Catholic Cultural Association” called “Permanencia” and responsible to replace the use from long to short waves in the Brazilian broadcast public company in 1926. See: Gustavo Corção, *Conversa em Sol Menor* (Rio de Janeiro: Livraria Agir Editora, 1980) pp. 142-146; Agnes P. Winter, *Cor Quo Vado* (Rio de Janeiro: Casa da Palavra, 2004); Time Magazine, ‘Religion: Largest Christ’, 26/10/1931.

387 Ruy Castro, *Rio de Janeiro: Carnival under fire*, trans. by John Gledson (New York: Bloomsbury, 2004) p. 7.

388 Pope John Paul II. *Message for the occasion of the illumination of the statue of Christ the redeemer at Corcovado*. (Castel Gandolfo: Vatican Archive, 12/10/1981).

straight lines, simplified aspect”,³⁸⁹ looking imposing, straight and firm. The cross-shaped Christ enlightens the land of the missions and, conversely, “brings to Italy, centre of Christianity, the remembrance of the discovery of the Americas”.³⁹⁰ The Christ as a tower, stood at the highest natural point, established a connection between spiritual conquest, spatial omnipresence and modern technological civilization.

There are scarce approaches to the political, religious and cultural participation of the spectrum in colonial procedures from the formulations of Latin American communication, cultural or decolonial studies; less still the elaboration of ideas on such Western-colonial procedures as an aesthetic domination. Thus, the connection between aesthetics and the electromagnetic spectrum is weakened, harassed, obstructed and intimidated by a self-inflicted disinterest over a “technical” limitation, difficulty and incompatibility. The behaviour in not connecting such spheres with the emphasis in coloniality, not only abides to the conceptual movement of Western rational definitions where the language of the concepts imposes an idea, but delays the potential for the creation of a counter-colonial idea itself.

In this chapter, I explore the colonial aspect of instructional and behavioural procedures that found in radio projects a way to domesticate and guide conducts, beliefs and behaviour. Since the early days of the conquest, the written and spoken word has been important in the search for Catholic discipline and values, a fundamental element to the more general process of cultural and political conquest. Radio Sutatenza’s work demonstrates a combination of policies of radio, valuing a particular civilizing culture, work ethics, national identity and practices of expression control. For the elaboration of this chapter, much of the radio’s literature in Spanish and documentation from the UN and UNESCO covered Sutatenza’s work during a long period of its operation were consulted. In addition, I conducted research at the collection of rare works at the Miguel Angel Arango Library, in Bogotá, where the radio’s collection is located.

Almost all documentation on Rádio Sutatenza addresses the project as a positive initiative in education, good manners and socio-cultural development. However, here I take a critical view of the phenomena, trying to demonstrate how its practices are connected with a colonial heritage of disciplining the population and to adapt society to the values and objectives of a capitalist civilization marked by twentieth century geopolitics. Thus, I identify how radio, even the so-called educational, community and grass-rooted, can be seen as a central piece to the purposes of the modern-colonial project.

389 Emerson Giumbelli, *Brasileiro e Europeu*, *ibid.* p. 47.

390 Piece of a letter from the Italian ambassador in Brazil quoted by Amandio Soares, *O Rio maravilhoso: Collectanea litteraria e turística da cidade do Rio de Janeiro* (Rio de Janeiro: Irmãos Pongetti, 1934). p. 28.

By examining the context of the radio alongside the universe of colonial enterprise, I also wish to address a counter colonial critique of the notion of the aesthetics that is normally identified with the decolonial thought. *Decolonial aisthesis*, a term coined by the Modernity Coloniality Program, which will be explored below, is not, in my view, a good expression to represent what is actually the birth and consolidation of the aesthetics itself as a field of battle. There is no modern aesthetics without the colonial venture. When one examines the line traced by communication in colonial contexts, it becomes noticeable that modern aesthetic experience and aesthetic domination are consequences of the way the colonial reality connected sensation, perception and meaning with communication, the use of technology and disputes for territory.

The line drawn by aesthetics in colonial modernity is an essential part of the discussion of how social struggles are developed in communication today. It is not the ancient Greek term or a fond memory of ancestry in museums and galleries which stamps the counter colonial practice, but rather the work, technique, conquest, and social reality that projects the direction of a communication policy and ethics in this battle for the expression.

Here we see that radio and religion are examples of the design that the wireless aesthetic universe breaks the boundaries of art and becomes a matter of policy, spirituality and the path to a developed Western-like civilization. Combining the orality, the religious mandate of the conquerors and the process which would establish the modern framework of Latin America, communication in general, and radio in particular, appears to be a strong synthesis of the battles which takes aesthetic as a powerful element for examining the force of coloniality.

Mater et Magistra

With an inked brush he marked everything with its name: table, chair, clock, door, wall, bed, pan. He went to the corral and marked the animals and plants: cow, goat, pig, hen, cassava, caladium, banana. Little by little, studying the infinite possibilities of a loss of memory, he realized that the day might come when things would be recognized by their inscriptions but that no one would remember their use. Then he was more explicit. (...) This is the cow. She must be milked every morning so that she will produce milk, and the milk must be boiled in order to be mixed with coffee to make coffee and milk. Thus, they went on living in a reality that was slipping away, momentarily captured by words, but which would escape irremediably when they forgot the values of the written letters.

At the beginning of the road into the swamp they put up a sign that said MACONDO and another larger one on the main street that said GOD EXISTS.

(Gabriel García Márquez, *One hundred years of Solitude*)

The above canonical piece of Gabriel García Márquez describes a process in which words, as instructive referents, are used as hopes against a general loss of memory which fell over Macondo. His initial parataxical operation suggests the power of naming as knowledge production.³⁹¹ As an American drama, the constant tensions provoked by the colonial separation between sign and word had been a decisive power in a sort of pedagogical indexicality. Márquez shows that the absence of meaning provoked by the loss of memory also required the explanation of words as gestures, that is, the instruction which coordinates and subordinates the words to the uses in real life.³⁹² At the end of the quote, the sign imposes the name of the place by baptising the space and, above all, there comes the wordly assurance of God's existence. The operation that legitimises either the existence of the smaller fragment such as door, wall or bed and the one required to reveal a real God depends on the same exegesis. This forced exegesis is part of what was called by Walter Mignolo as the "tyranny of

391 The reference to the conquest appears here as a parody of Columbus letter from 1493, on which he writes: "I discovered many islands inhabited by numerous people. I took possession of all of them for our most fortunate King by making public proclamation and unfurling his standard, no one making any resistance. To the first of them I have given the name of our blessed Saviour, but the Indians call it Guanahani. To each of the others also I gave a new name, ordering one to be called Sancta Maria de Concepcion, another Fernandina, another Hysabella, another Johana; and so with all the rest".

392 Derrida highlights that the production of proper names is an obliteration which constitutes the originary legibility of the very thing it erases and the original myth of a transparent legibility present under the obliteration. Thus, the proper name is possible through its functioning within a classification and, therefore, within a system of differences.

the alphabet”,³⁹³ concerning the letters; the “spiritual conquest”,³⁹⁴ named by Ricard, related to the role of the church or Gruzinsky’s “colonization of the imaginary”,³⁹⁵ about the power of cultural manifestations. Derrida relates such operations of writing and speech with the construction of logocentrism and phonocentrism which modelled the language of ethnocentrism and teleology. The spoken, sung and written word are also elements which acted as formative fragments which compose the articulation between aesthetics, the spectrum and coloniality.³⁹⁶ They also framed the way in which policies towards an inferior and less capable presence acted in the process of colonizing expressions.

The demoniac presence in the new world has been confronted by colonizers since the early days of the conquest and one recurrent situation of conflicts was the sonic environment. Gary Tomlinson writes that the demonic spirits was attested by its voice,³⁹⁷ heard as outcries by occupiers of the Bermuda island in the Caribbean. Due to the absence of indigenous populations and rumours of an existence of a *demoniorum insulam*, navigators and explorers feared a “haunting presence of something else” on the island perceived as an enchantment from a “desert habitations of devils”. Besides the aforementioned drums of Aztec, the sound also appears in Shakespeare’s unnamed island through the mouth of the monstrous native Caliban. Here, the comforting sound of an invisible musician guided the characters of “The Tempest” into a plot to kill Prospero, the foreigner master controller of spirits: “the isle full of noises / Sounds and sweet airs that give delight and hurt not / Sometimes a thousand twanging instruments / Will hum about mine ears; and sometimes voices”.³⁹⁸

On the side of God, Bartolomé de Las Casas’ “Short Account of the Destruction of the Indies”, as many European chronicles of his time, is full of descriptions of “wonders” and “marvellous” sensitive stimulus. Different from St. Paul, who, for Agamben,³⁹⁹ was the

393 Walter Mignolo, ‘Literacy and Colonization’, in *1492 – 1992: Re/discovering Colonial Writing*, ed. by René Jara, Nicholas Spadaccini (Minneapolis: The Prisma Institute, 1989) p. 57.

394 Robert Picard, *The spiritual conquest of Mexico: An Essay on the Apostolate and the Evangelizing Methods of the Mendicant Orders in New Spain, 1523-1572* (Berkeley: University of California Press, 1966).

395 Serge Gruzinski, ‘A Cristianização do Imaginário’, in *A Colonização do imaginário: Sociedades indígenas e ocidentalização no México espanhol séculos XVI-XVIII*. (São Paulo: Companhia das Letras, 2003) pp. 218-283.

396 “Language ethnocentrism, in that phonetic writing, while subordinated to speech, could (...) be raised over all other writing systems, since it (...) represented presence-in-speech more faithfully than nonphonetic writings systems. Language teleology, in that Europeans quickly incorporated the nonalphabetic scripts they studied in a vision of historical progress toward phoneticism, a progress then correlated with a presumed societal evolution”. Gary Tomlinson, *The singing of the new world: Indigenous Voices in the era of European Contact* (Cambridge: Cambridge University Press, 2007) p. 12.

397 “is a fact not enough remarked that the demoniac presence on Bermuda was known above all else, by its voice”. Gary Tomlinson, *The singing of the new world*, *ibid.* p. 2.

398 William Shakespeare, *The Tempest* (London: Macmillam and Co, 1864) p. 47.

399 Giorgio Agamben, *The time that remains: A commentary on the Letters of the Romans*, trans. by Patricia Dailey (Stanford: Stanford University Press, 2005).

representation of the messianic Jew-Christian Western thought, Las Casas' epiphany was more secular, not by divine intervention of God, not phenomenologically nor as a contracting time of *chronos*, but arises from seeing, hearing and participating in a secular time full of novelties and paradoxical perceptions. The reign of man⁴⁰⁰ along with its sufferings also began to inspire a new law of God, awakened by a command of the voice and the necessity to speak out:

The bread of the needy is their life: he that defraudeth him thereof is a man of blood. He that taketh away his neighbour's living slayeth him; and he that defraudeth the labourer of his hire is a bloodshedder. When one buildeth, and another pulleth down, what profit have they then but labour?.⁴⁰¹

Besides a scientific and technological achievement which expanded the European borders, cosmology, cartography, biology, geography, anthropology and language, the birth of what we know today as America was also a challenge for European expression and imaginary production.⁴⁰² The birth of an outspoken modern humanism and 'universal' human rights was only possible by ethical and moral choices opened up by a new sensory novelty and the centrality of the preaching voice:

It would be impossible to express in words the beauty and fertility of this region, its healthy climate and the prosperity of its many people (...) the quality and abundance of the local produce was sufficient to support a huge population (...). These people are also naturally gentle and unaggressive. The despot himself and his tyrannical companions proceeded to wreck this region as they had wrecked other (...) it is beyond human capacity to compile an accurate log of the murder, cruelty, false imprisonment and other crimes they committed.⁴⁰³

Marshall McLuhan reminds us that, in his "Summa Theologica", Saint Thomas Aquinas "considered that neither Socrates nor Our Lord committed their teaching to writing because the kind of interplay of minds that is in teaching is not possible by means of writings".⁴⁰⁴ Aquinas defends his argument based on three points: the excellent teacher has a particular manner of teaching which imprints the doctrine "in the hearts of the hearer", therefore, not through the mediation of the text. Second, the doctrine cannot be reduced into writing, otherwise, "men would have had no deeper

400 "The renaissance had reopened for all Europeans the political possibilities of the Christian community (...) the theme of the city of man, which had been overshadowed during the Middle Ages by the importance given to the city of God." Carlos Fuentes, *The buried mirror Reflections on Spain and the New World* (New York: Mariner Books, 1999) p. 124.

401 This bible passage (Ecclesiasticus 34: 21-2), is said to be the piece on which Las Casas woke up and went from a benevolent master (encomendero) of Indians to an "Indian Apostle". In 1511, after attending to a sermon of Dominican Priest Antonio Montesinos and witnessing the massacres in the island of Cuba, while preparing his Easter sermon, he encountered this text which "led directly back, and gave meaning to, the suffering of the Indians of which he had been a hitherto unreflective witness". See: Anthony Pagden, *European Encounters with the New World: From Renaissance to Romanticism* (Yale University Press, 1993). pp. 70 – 73.

402 See: Sarah H. Beckjord, *Territories of History – Humanism, Rhetoric, and the historical imagination in the early chronicles of Spanish America*. (Minneapolis: Pennsylvania State University Press, 2007).

403 Bartolomé de Las Casas, *A Short Account of the Destruction of the Indies* (London: Penguin Books, 1992) p. 31.

404 Marshall McLuhan, *The Gutenberg Galaxy. The making of typographic man* (Toronto: University of Toronto Press, 1962) p. 23.

thought of His doctrine than that which appears on the surface of the writing”,⁴⁰⁵ and third, the orderly manner of teaching the doctrine should follow a path which would start in the Christ and be multiplied by preaching and writing of its disciples, and not instantly through his own writing. Aquinas also values institutions, disciples and apostles, since they carry the teachings and catch the legitimate form of Christ’s “dictation” of laws “written not in ink (...). not in tables of stone, but in the fleshy tables of the heart”.⁴⁰⁶ It was Christ himself, said Friar Montesinos,⁴⁰⁷ through his own “terrifying” voice, who declared that the massacre happening in New Spain was a “mortal sin”. Speaking to those who were condemning a vast number of souls to hell by not saving them by good will and evangelization, he announced the foundational power of the politics of voice in Latin America by sermonising:

I am the voice of one crying in the wilderness. In order to make your sins known to you I have mounted this pulpit, I who am the voice of Christ crying in the wilderness of this island; and therefore it behooves you to listen to me, not with indifference but with all your heart and senses; for this voice will be the strangest, the harshest and hardest, the most terrifying that you ever heard or expected to hear....⁴⁰⁸

As Cornejo Polar affirms, the case of the early writings on America presented a will to “truly” portray a “new, unknown, insoluble reality” along with revealing it to a reader who “totally or partially ignores it”.⁴⁰⁹ The baptism of America was made amidst the attempt to make sense of either the beauty⁴¹⁰ and the vicious that “the privileged seat of the hopes of humanity”⁴¹¹ presented. The encounter with the natural, spiritual and human ‘other’ required religion to create a relationship with a new language provided by this novelty. The dreadful process of conquering led to the liberation of imagination necessary to mold the sense-making of the civilized mind including the clashes between sense and meaning forced a construction of an aesthetic idiom. Such early writings, as the birth of an aesthetic paradigm traced over the confused fabric of synaesthetic and pareidolic communication, provided, in the words of Arciniegas, a “Bewitchment of the idiom”.⁴¹²

405 Thomas Aquinas. *Summa Theologica, Part3, L42, C5*. (Ontario: Devoted Publishing, 2018) p. 210.

406 The Bible. (2 Cor 3:3)

407 Antonio de Montesinos was a Spanish Dominican Friar and missionary in the Island of Hispaniola and died in Venezuela in 1545.

408 António de Montesinos, ‘Are they not man? - Sermon of 1511’ in Suzan McIntire & William E. Burns, *Speeches in World History* (New York: Facts on File, 2009) p. 122.

409 Antonio Cornejo Polar, *O condor voa*. (Belo Horizonte: Editora UFMG, 2000) p. 164.

410 “This island has marvelously temperate breezes, and marvelous meadows and fields incomparable to those of Castile; and the same can be said of the rivers of great and good waters, most of which are gold-bearing. There are so many and such good sea harbors that it has to be seen to be believed.” Columbus, Christopher, ‘Letter to the Sovereigns of 4 March 1493 Announcing the Discovery’, In: Stephen Greenblatt, *New World Encounters* (Berkeley: University of California Press, 1995) p. 5.

411 Quijano, Anibal. ‘Modernity, Identity and Utopia in Latin America’, in *The postmodern debate in Latin America*, ed. by John Beverly & Michael Aronna (Durham: Duke University Press, 2002) p. 203.

412 Talking about the “dimension of adventure” that the Spanish idiom had to incorporate, German Arciniegas writes the “Suddenly the word are receiving the caress of the Caribbean wind, and the phrases becomes images of a new

The presence regarding an audible and pictorial expression from an alien nature was paramount to establishing a rationale for the senses as well as a fundamental exercise to retrieve from there an explanatory language for aesthetic domination:

Sound always disrupts, is always in excess, because sound, even verbal sound, never matches with and is never contained by the signified. Sound is a failed word, or the word is an inadequate sound, because of this excess of meaning, when the word is not made flesh and is in this sense transcendent. But sound needs another to hear it, and to perpetuate the infinite play of the signifier, which cannot be done unless sound renounces aesthetic self-sufficiency. The aesthetic is actually brought about through the breaking of silence and through the desire of the other.⁴¹³

The benevolent speech of those pioneers towards the natives, therefore, gave birth to modern discourse and practices “that from then on also obeys the imperative of social utility under the bias of philanthropy and the defense of the other”.⁴¹⁴ Committed to the salvation of souls, the apostolic call to preach and teach against the sins created not only a strategy to be heard by the expansion of its voice but – as a catholic mission to civilize and develop – resulted in a form of aesthetic tutelage which determines modern and colonial policies around the idea of media and culture.

In America, ethics and morality, combined with an extraordinary experience of the senses, illuminated a catholic ‘policy’ as well as an ethos which had on the ‘other’ a central pivot. The Catholic questions around “By what authority have you made such detestable wars against these people who lived peacefully and gently on their own lands? Are these not man? Do they have rational souls? Are you not obliged to love them as yourselves?”⁴¹⁵ have framed perceptions over culture which surrounds the Church’s actions on the continent since the early days of the conquest. This conflict between the act of instructing, educating and baptising through a patronizing voice together with the civilizing mission against the practical political position to include the savage, indigenous, poor and primitive under the sacred rule, found an exemplary instrument in radio use and perception. As an activity which is enchanted and telluric, the spectrum usage and its very hybrid constitution seems to fit well to the tradition of the Catholic church as the exercised practice of power and good will, representing the expansion into territorial salvation by the management of voices and messages: “Conquest is the annihilation of the other as other; it is the establishment of rule. To rule is to dominate the other”.⁴¹⁶ Radio summoned the modern technological tool towards civilization, the divine property of the teaching voice and the expansion of messages into space as

world. One had to invent new voices, adopt as legitimate much of what the Indians had fabricated, to extend the theme of the language to so unexpected or unpredictable things, that, from all of it, rises a new literature”. German Arciniegas, *Historiadores de Indias* (Mexico DC: Oceano De Mexico) p. 10.

413 Isobel Armstrong. *The Radical Aesthetics*. (Oxford: Blackwell Publishers, 2000) p. 94.

414 Michel de Certeau, *The writing of history* (New York: Columbia University Press, 1988). p. 129.

415 Antonio Montesinos, Sermon delivered in the church of Santo Domingo, 1511 in, Las Casas, *ibid.* p. 84.

416 Enrique Dussel, *Ethics and the theology of liberation* (New York: Orbis Books, 1978) p. 11.

the pedagogical “privilege of the living word, which is destined to be heard, in contrast to the word that is an image and already a picturesque sign”.⁴¹⁷ As carrier of idioms, messages, classes, sermons, speeches and instructions, this colonial-religious aspect of radio is yet another fragment which composes as well as qualifies the radio spectrum’s landscape in colonial realities.

Radio Sutatenza

The first evangelizers to arrive at Sutatenza Valley, in 1556, were Dominican priests. The region was inhabited by Indians of Muisca ethnicity and Gonzalo Jimenez de Quesada conquered the region in 1537 for the Spaniards. Colombia is known for its abundant Gold’s deposits,⁴¹⁸ which made it a pivotal place for the search for El Dorado, the mythical city of gold which inspired many conquerors to colonize the area. The lake of Guatavita, a sacred place for the Muisca, was a site where religious ceremonies used to happen, as a consequence one of the rituals was to throw golden artefacts into the Lake in order to get favours from the Gods, hitherto, the legend of this being the place of the golden site. The lake is 50 km from the Sutatenza valley.

However, it was not until August 1968 that a head of the catholic church paid a visit to Latin America, when Pope Paul VI landed in Colombia. The document which inaugurates what was developed as a “theology of liberation”⁴¹⁹ is fruit of the “episcopal conference of Latin American bishops” (CELAM), held in Medellín which the Pope himself opened at the Bogotá Cathedral. The document of the conference mentioned the “necessity of human promotion for indigenous and rural population”, supported “agrarian reform”, “peasants cooperative organizations”, “formation of social consciousness” and, in its section on “Latin American situation and the peace”, alluded to “three big groups of tensions” formed by: a rising class struggle, inequality and colonialism within the nations; International tensions due to neo-colonialism as well as the growing stress amongst Latin American countries.

John XXIII had initiated the *aggiornamento* (meaning openness, update, actualization) indicating the idea that the church should move towards modernity and openly face the earthly social problems. Since 1963 and the second Vatican Council, the eyes of the catholic church started

417 Emanuel Levinas, ‘The transcendence of words’, in *The Levinas Reader* ed. by Sean Hand (Oxford: Blackwell, 2001) p. 148.

418 The *Museo del oro*, in Bogotá is an astonishing demonstration of the crafts and goldsmith quality by the original population of those areas.

419 The idea that the poverty, oppression, violence and injustice were a sin committed against the Lord, unfolded in the creation, in the 20th century, of a “theology of liberation” influenced by Marxism and the social, economic and geopolitical situation at the time. This particular expression of Catholicism participated in popular pedagogical practices, guerilla movements, artistic expressions and left-wing political parties. See: II Conferência Geral do Episcopado Latino-Americano, *Conclusões de Medellín* (São Paulo: Ed Paulina, 1968).

to turn to what today is called the “Global South”, agitated by the political moment of the cold war,⁴²⁰ extreme poverty, dictatorships, guerrillas and social unrest. In his most famous Encyclical, *Mater et Magistra* – on the recent development of the social question in the light of Christian doctrine, from 1961, the Pope addressed both the scientific achievements in different fields and “the progressive perfection of modern methods of thought-diffusion – the press, cinema, radio, television”.⁴²¹

A radio station located in a municipality named Sutatenza, in the rural area of Boyacá, was visited and blessed by Paul VI the day before the inauguration of the CELAM conference (fig.10). At that time, the station was 20 years old, having 5 stations and more than 750kW of power. The only picture of that moment shows the bishop of Rome ahead of a “Continental Electronics”⁴²² banner, reading out loud a blessing sermon surrounded by church members.

420 The cold war, as a geopolitics in which the North-South relation were more structural than the intra-european one, was extremely connected to social and political moment of the third world. The birth of the bipolar period in Latin America is said to have started in 1945, when the principles of the Monroe doctrine were brought back by the meeting of the American States happened in Rio de Janeiro. The records of the US National Security Council shows the intention of the US government to foster national and regional security measures to prevent influences from Moscow and adopted anti-communism resolution to the inter-american regulations. See: Odd Arne Westad, *The Global Cold War: Third World Interventions and the Making of our Times* (New York: Cambridge University Press, 2005) p. 396; See also: Juan Sebastian Salgado, ‘La guerra Fria llega a America Latina: La IX conferencia panamericana y el 9 de Abril’ in *Analisis Politico* (Bogotá: n.79 Sep – Dec 2013) p. 27. Available at: <http://www.scielo.org.co/pdf/anpol/v26n79/v26n79a02.pdf>

421 Pope John XXIII, *Encyclical Mater et Magistra: On Christianity and Social Progress*. May 15, 1961.

422 “General Electric Corporation of the US donated Radio Sutatenza’s first proper transmitter, a 250-watt professional unit, and 100 radio receivers. They evidently saw a huge potential market for radio receivers, and so they also invited Salcedo to New York, all expenses paid. (...) In the event, General Electric continued to be the most generous supporter. They donated a 1,000-watt transmitter, 150 more radios, and antennae and other accessories to a value of US\$60,000, a large sum of money in those days.” Colin Fraser & Sonia Restrepo-Estrada, ‘The quick and the dead: A tale of two educational Radio programmes’ in *Communication for Development: Human Change for Survival* (New York: I.B. Tauris, 1998) pp. 130 – 161, p. 150.

Fig. 10: Pope Paul VI at Boyacá in the “Encuentro Campesino con el Papa Paulo VI – 23 de Agosto de 1968”. Available at the Acción Cultural Popular, *Programación*, 1969. Photo by the author. Archives of the Red Cultural del Banco de la República en Colômbia. Biblioteca Miguel Angel Arango. (<www.banrepcultural.org>).

In 1947 Theodor Adorno was teaching his readers and students that “Films, radio and magazines make up a system which is uniform as a whole and in every part”⁴²³ and that the myth of technological progress had replaced the religious enchantment of prior times. In Sutatenza, on the Andean region of Colombia, a catholic priest named Joaquín Salcedo started the use of a 100W amateur radio transmitter (fig.11) to undergo a project of literacy and evangelization, based on the idea that the poverty suffered by the *campesinato* was fully bound to their lack of education. In May 1948, Salcedo got a licence from the Ministry of Communication to install a cultural radio with transmission power of 250Watts⁴²⁴ which covered 15 radio-schools with a once in a week educational radio show. In August 1949 another licence was released allowing Sutatenza to broadcast in short waves with a power of 1kW following that, in October of that same year, the ACPO⁴²⁵ (*Acción Cultural Popular*) was registered as a civil organization responsible for the Radio.

423 Theodor Adorno, Max Horkheimer, *Dialectic of Enlightenment* (London: Verso, 1997) p. 120.

424 This is reported in Reynaldo Parejas, ‘Radio Sutatenza: Notas para su historia’ in *Comunicacion y Cultura en America Latina*, (vol.8, n. 8, 1982).

425 Although the inauguration of the activities of ACPO was in 1947 with a transmitter then still unlicensed, the formal organization of the association is from 1949 (resolution 260 of October the 18th) and the shift of ACPO to a juridical ecclesiastic body was given on the 29 of June 1951.

Fig. 11: First 100W transmitter used by Sutatenza. Museu de Radio Sutatenza, Boletín Cultural y Bibliográfico, Vol 46, Num 82, 2012. Archives of the Red Cultural del Banco de la República en Colômbia. Biblioteca Miguel Angel Arango. Available at: www.banrepcultural.org

In 1955, a publication from UNESCO,⁴²⁶ celebrated the achievements of ACPO which now possessed a 25KW radio transmitter (said to be the most powerful in Colombia), covering 200.000 people over 12 of the 16 Colombian departments and eventually “overflowing to neighbours Venezuela and Ecuador”.⁴²⁷ At that time, its signals were captured by 6.000 “battery powered short-wave receivers manufactured for ACPO by Dutch and American companies” specially built to tune only radio Sutatenza in order to “preserve the life of their batteries”. The radio’s mission was to bring “literacy and general culture” for the 7 million illiterates of Colombia.

Gal. Gustavo Rojas Pinilla, former Mail and Telegraph Minister and an acquaintance of Father Salcedo was the dictator of Colombia from 1953 to 1957. With the objective to put the country back on track after the political turmoil at the end of the 1940s, Pinilla was able to mount a substantial political support which included the Catholic church. The period of his mandate was the time when the Sutatenza’s network thrived the most. In that period, Salcedo was not any more in Boyacá, but working from the “seventh floor of the biggest office building in Bogotá (...) with a panoramic view of the mountains of Guadalupe and Montserrat”.⁴²⁸ Although Sutatenza was not free from attempts of official intervention, it remained with a certain degree of autonomy due to its “community” engagement, its lack of clear political position and its affiliation with the powerful and mostly conservative catholic church. To prevent the disturbances from the troubled political situation, Salcedo changed the status of ACPO from a cultural institution to an “ecclesiastic body” during Pinilla’s administration.

426 UNESCO, ‘Don Quixote of the Radio’ in *Courier: A window open on the world* (Awakening Continent: Latin America in new perspective, Year 8, n.2, 1955).

427 UNESCO, ‘Don Quixote of the Radio’, *ibid.* p. 19

428 UNESCO, ‘Don Quixote of the Radio’, *ibid.* p. 24.

The most successful period of the radiophonic schools reflected into the development of governmental long-distance education programs in Colombia, which were financially supported by the Colombian *Banco Central Hipotecario* and foreign catholic institutions.⁴²⁹ The UN, through UNESCO provided technical and cultural assistance as well as institutional support. In 1969, the program grid was full from 3:55 in the morning to 11:00 at night, with a variety of contents from courses, news, sports, story-telling, soap operas, feminine as well as children thematics (fig.12).

Counting with the support of UNESCO, the World Bank, the Inter-American Development Bank, Electronic Manufactures and the USAID, ACPO helped to create indicators to measure the impact of its work on peasants in 1976.⁴³⁰

The blazon (coat of arms) of the city of Sutatenza (fig.13) is constituted of five elements within the insignia, along with a banner in which one reads “culture” and “development”. The five elements represent the faith in God (a white triangle), culture and science (an open book), agricultural labour (a shovel), sports (a weird drawing of an athlete and Olympic rings), and, covering the whole insignia, a radio antenna, “symbol of the radiophonic schools, for which Sutatenza is internationally known”.⁴³¹

429 “en 1951 la Unesco le brindó asistencia técnica y cultural. La asistencia económica de los primeros años la proveyó el Banco Central Hipotecario con un préstamo a largo plazo y el aporte de las fundaciones religiosas alemanas *Misereor* y *Adveniat*”. Reynaldo Parejas. *Radio Sutatenza: Notas para su historia*. *ibid.* p. 39.

430 “Some of the indicators were: avoidance of the practice of burning to prepare land for cultivation; construction or improvement of animal shelters; planting of family vegetable gardens; practice of personal hygiene; ability to read and write; and participation in study groups.” Colin Fraser & Sonia Restrepo-Estrada, ‘The quick and the dead’, *ibid.* pp. 155-156.

431 Academia de Historia de Boyacá. Magisterio de primaria de Sutatenza. *Monografía del municipio de Sutatenza* (Sutatenza: 1986). p. 81.

Fig.12: Schedule of Radio Sutatenza from 1969. in *Acción Cultural Popular. Programación*, 1969. Photo by the author.

Radio Sutatenza is defined by Hernando Alarcón as an “experience of educational innovation especially oriented to grown *campesinos* of Colombia, under the concept and methodology of ‘radiophonic schools’”,⁴³² representing “the most widespread and important use of radio and other communication media for educating rural people ever seen”.⁴³³ The radio focused on long distance open education in rural areas and it is remembered as “the first experience of use of radio for literate people”⁴³⁴ and most likely the first wireless media to do so in Latin America.

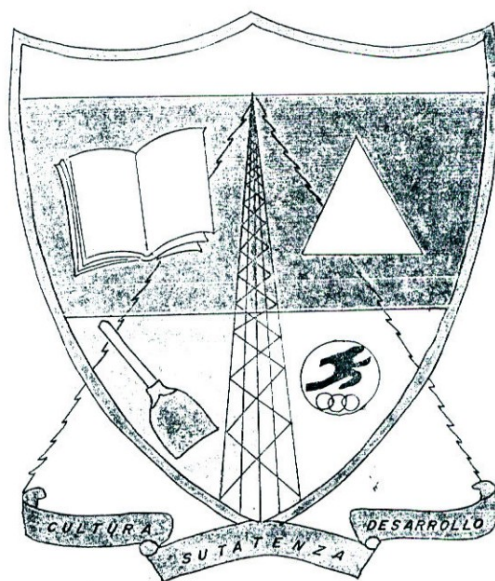


Fig 13: Cote of Arms of the municipality of Sutatenza. Academia de Historia de Boyacá. Magisterio de primaria de Sutatenza. Monografía del municipio de Sutatenza. (Sutatenza: 1986). p81.

432 Hernando Bernal Alarcón, ‘Radio Sutatenza: un modelo colombiano de industria cultural y educativa’, in *Boletín Cultural Bibliográfico* (vol.46, n.82, 2012).

433 Colin Fraser & Sonia Restrepo-Estrada, ‘The quick and the dead’, *ibid.* p. 144.

434 Mejía, Gabriel Gomez, ‘Sutatenza: Retos y Sueños de un proyecto radial’, in *Boletín Cultural y Bibliográfico*, (vol 46, n. 82, 2012).

Pharmakon Policies

The Radio in Latin America officially started in the second decade of the twentieth century⁴³⁵ with stations controlled by the State, following the standards instructed by the ITU. In the case of Colombia, the first signal was broadcast by the short-wave *Rádío HJN* during the mandate of president Miguel Abadía Méndez. On July 18, 1928, the government passed the bill 1.183 which established “the conditions on which the government can concede permissions to the installations of periphonic broadcast stations”.⁴³⁶ On September 5, 1929, the Minister of Mail and Telegraphs inaugurated the *Radio HJN* with a speech from its studios in the suburbs of Bogotá. The newspaper *El Espectador* announced a concert from within the radio studio for 6pm that day, foreseeing Theodor Adorno’s displeasure with the new technology and the loss of the orchestra’s *hic et nunc* which composes the aura of the live concert.⁴³⁷ According to Vicente Stamato, the schedule of the Radio for the first days was formed by concerts of the National Police Band, classic music shows and international and economic news. The radio shut down its activities in 1938 when the ministry of education, in a message to the congress, declared that

because our illiterate people are the most needed part, and precisely that where the book (...) has no action/function at all, (...) I have been defending the necessity in making the National Library responsible for its campaign of popular culture supported by educative radio and cinema. In previous years, we have tried with extraordinary success the HJN Radio Station, but we had to abandon it for machinery deficiencies.⁴³⁸

This position marks a political perspective in which communication technologies appeared to serve as support to a wider program of educational and literacy campaign, in a view which takes media as technical tools to enhance “popular culture” in the form of a patronized media controlled (even if indirectly) by the State.

In 1940, president Eduardo Santos inaugurated the new public station named *Radiodifusora Nacional* which was fostered by his brother Gustavo Santos – national director of Fine Arts – and

435 Soon after, catholic stations started to air, forming a tradition which grew until the 1980’s.

436 “Por el cual se establecen las condiciones en que el Gobierno puede conceder permisos para la instalación de estaciones transmisoras de perifonía”. Vicente Stamato, *Días de Rádio* (Bogotá: Revista Credencial Historia, n.186, June 2005). Available at: <<http://www.banrepultural.org/blaavirtual/revistas/credencial/junio2005/radio.htm>>

437 In his years in New York city, Adorno conducted research on radio, reception and managerial aspects of mass culture but never released them in a form of a book. His critique of authoritarian personality is extended either to the institution of the orchestra and the radio, the former being related to the charismatic figure of the conductor and the later, as authoritarian form of imposing popular culture. See: Theodor Adorno, *Current of Music*, ed. by Robert Hullot-Kentor, (New York: Polity Press, 2009).

438 “Pero como nuestro pueblo analfabeto es la parte más necesitada, y justamente aquella donde el libro, si llegare, no tiene acción alguna, desde mucho tiempo he venido sosteniendo la necesidad de suministrar a la Biblioteca Nacional para su campaña de cultura popular las muletas de la radio y de la cinematografía educativa. En años anteriores ensayamos con éxito sorprendente la radiodifusora HJN; pero tuve que abandonarla por deficiencias de la maquinaria...” Vicente Stamato, *Días de Rádio* (Bogotá: Revista Credencial Historia, n.186, June 2005). Available at: <<http://www.banrepultural.org/blaavirtual/revistas/credencial/junio2005/radio.htm>>.

set up in the centre of Bogotá. The new radio, according to the presidential speech on the occasion of its début, should “belong to the Colombian nation and to be in its exclusive services”. He added that the purposes of the station would be to “work for the national culture in all its aspects, collaborate with universities, colleges and schools in an intense labour of learning and contribute to the artistic taste”.⁴³⁹ That is, culture and education are seen as external to the media, as this would only function to foster the noble purpose of educating and propagate culture. Both the late *HJN* Radio and *Radiodifusora Nacional* were attempts to promote a public policy which sees media as detached trampolines for other social policies. The policies were set up around the primacy of the state and used to enforce the cultural idea of nation.

Since 1945, the technological resources for communication were given enormous importance by the United Nations in order to accomplish the task of educating, propagating UNESCO’s values and offering cultural contents to populations across the globe. It seemed to harmonize religious values with modern paradigms, as the representative of Netherlands at the inaugural conference of UNESCO said that “Education is always dependent on some faith, tending towards some ideal. It therefore cannot limit itself to work in schools and universities. It comprises the whole field of modern culture-radio, press, films”.⁴⁴⁰ The foundational document of UNESCO celebrates radio technology as a tool for educational purposes in order to:

Assist the free flow of ideas and information among the peoples of the world through schools, universities and other educational and research institutions, libraries, publications and the press, the radio and the motion picture, international conferences and the exchange of students, teachers and all other representatives of educational and cultural life, with special attention to the exchange of information on major educational and cultural developments, including advances in scientific knowledge.⁴⁴¹

This perspective is related to the path of the post-war cultural policy of André Malreaux⁴⁴² in France, who aimed to extend high culture and “valid artistic goods” to ordinary people through “inclusion” and “access”, a perspective sealed by the notion of “the right to culture” (as opposed to “cultures as right”) included in France’s constitutions and in the chart of universal human rights. This “cultural democratization” was a form of reaching universally those with no possibility of engaging to what is understood as artistic quality and cultural heritage.

439 “trabajar por la cultura nacional en todos los órdenes, colaborar con universidades, colegios y escuelas en intensas labores de enseñanza, contribuir a la formación del gusto artístico” Vicente Stamato, *Días de Rádio*, *ibid.*

440 UNESCO. Conference for the Establishment of the United Nations Educational, Scientific and Cultural Organization. Held at the Institute of Civil Engineers, London, from the 1st to the 16th November, 1945. p. 50. Available at: <<http://unesdoc.unesco.org/images/0011/001176/117626e.pdf>>

441 UNESCO, Conference for the Establishment of the United Nations Educational, Scientific and Cultural Organization. *ibid.* p. 1.

442 See: Andre Malreaux, *La politique, la culture: Discours, articles, entretiens (1925-1975)*, (Paris: Gallimard, 1957).

Father Salcedo was regarded by UNESCO⁴⁴³ as an adventurous “young Catholic priest”, who wanted to improve the lives of those who “scrape their livelihood from incredible farms hugging dizzy mountain slopes”.⁴⁴⁴ As a visionary envoy of a modern world, a “Don Quixote of the Radio”, he was celebrated by having mobilized the population through the multimedia modern novelty and their lessons on how to be educated, obedient and resolute in contrast to a sort of wild life of relegated savages in the mountain jungle. The UNESCO propaganda pictures a difficult, “steep” and “grim” geography where illiterate, alcoholic, rough and underdeveloped inhabitants “farmed their plots as their ancestors had always farmed them”.⁴⁴⁵ Tenza Valley, the place where the municipality of Sutatenza lies, is described as a “topographical chaos” with its “fertile, sub-tropical (...) tortured jumble of hills and ridges, serpentine valleys and side valleys”.⁴⁴⁶

The educational model for the radio-schools was implemented using the “adobe homes” of the peasants as classrooms which contained basic material for learning. The “classrooms” were chosen amongst the homes of the “farmers with the most modern ideas in their communities”.⁴⁴⁷ The householders – coordinators entitled “immediate auxiliary” – were responsible to “take attendance, turn on the radio when the school begins, and write lessons on the blackboard according to instructions given to him by the unseen radio teacher”.⁴⁴⁸ The collective classes were organized around five components: “health, literacy, arithmetic calculus, economy and labour and spirituality”.⁴⁴⁹ The mediatic universe of Sutatenza included the periodical “*El campesino*”, recorded tapes, *cartilhas* (fig.14), books and video documentaries about its actions, methods and platforms for education.

443 From the documentation used in this research, a good amount was commissioned, funded or published by UNESCO (Fraser & Estrada; UNESCO) and one was funded by the Rockefeller Foundation (Gumucio Dragon, *ibid.*).

444 UNESCO, ‘Don Quixote of the Radio’, *ibid.* p. 18.

445 UNESCO, ‘Don Quixote of the Radio’, *ibid.* p. 18.

446 Colin Fraser & Sonia Restrepo-Estrada, ‘The quick and the dead’, *ibid.* p. 146.

447 UNESCO, ‘Don Quixote of the Radio’, *ibid.* p. 18.

448 UNESCO, ‘Don Quixote of the Radio’, *ibid.* p. 19.

449 Luis A. Sarmiento Moreno, *La educacion abierta y a distancia em Colombia*. *ibid.* p. 74. Fraser and Estrada point out fourteen objectives which were traced by ACPO throughout its project, including “basic skills of literacy (...) acquisition of economic knowledge (...) utilization of free time to participate in sport (...) reaching decision (...) living according to ethical and religious principles (...) development of political consciousness focused on the protection of human rights”. See: Colin Fraser & Sonia Restrepo-Estrada, ‘The quick and the dead’, *ibid.* p. 152.

Fig.14: Accion Cultural Popular. Cartillas de Lectura. Bogotá, 1957. Photo by the author. Archives of the Red Cultural del Banco de la República en Colômbia. Biblioteca Miguel Angel Arango.

Besides the celebration of the noble mission of civilizing, offering culture and dignity for rural population, the reports about radio Sutatenza mentions the harshness of the natural landscapes where Father Salcedo arrived to carry his mission: the “forgotten hamlet perched high in the Andes of Colombia”. Such arid environment where peasants were apparently doomed to make their living contributed to the radio’s success: “the isolation of the mountaineers made it possible for the *Accion Cultural Popular* to win them over”.⁴⁵⁰

The radio stimulated moral and behavioural patterns from the *campesinos* without moving them away from their daily duties. As an important break in their tight journey, the schedule of the radio sought to arrange the lessons in times as to fit to “the only time that most men can spare from their fields”.⁴⁵¹ Everything had to be clocked, compromised and ordered. Students arriving on time “filled the house in silence (...) by the half-light of the morning” when instruction alongside directions were given by the voice on the radio acting as pedagogue, tutor, teacher and priest. The UNESCO appeared to be amazed by the obedience and seriousness:

The sight of this class obeying an unseen teacher was uncanny. Every time the music began, every head bent down over every desk. Pupils worked conscientiously without a whisper or a nudge. School was serious business for these people.⁴⁵²

So powerful was the radio experience for UNESCO, that even the former *taberna*’s (rural bars) clients turned into polite students: “Alcoholism was common. There was no diversion but drink, and as often as not Saturday night in a *taberna* ended in a brawl with the principals finishing in the *Guateque* hospital down in the bottom of the valley”.⁴⁵³ Sutatenza had achieved the salvation of the wild peasantry and disturbed the small business of the fruition sites: “everyone likes [the radio] except the *tabernas*”, said one student from the radio schools. The public space of fruition represented by the tavern becomes a metonymy for alcoholism. The presented remedy for the

450 UNESCO, ‘Don Quixote of the Radio’ *ibid.* p. 20.

451 UNESCO, ‘Don Quixote of the Radio’, *ibid.* p. 18.

452 UNESCO, ‘Don Quixote of the Radio’, *ibid.* p. 20.

453 UNESCO, ‘Don Quixote of the Radio’, *ibid.* p. 18.

problem of the tavern is a quality applied to the radio waves which inducts to the closed space of the classroom (despite the pervasive property of the spectrum), the notion of a moral and behavioural environment as opposed to an ethical, inebriated and messy square. This disordered space “outside” the classrooms is invented, created and produced as excuses and subterfuges of colonial type. Linked to the disease of alcoholism, the public space is to be cured by the instructions transmitted by the private allocation of the radio space. Misguiding and compressing the meaning of radio as a tool of rational pedagogical technique, this view of radio as *Pharmakon* puts the radio use ahead of a paradox as it determines the value of closed and open spaces.

The radio was supposed to take over the sphere of the street⁴⁵⁴ turning the “public space” of the spectrum into a closed, oratorical, intimate, and instructive tool for the would-be modern peasant. The filthy environment (Salcedo referred to the homes as “anti-hygienic fortresses”) of the backlands were replaced by the instruction of hygiene classes. This is constantly made in different degrees by media everywhere, and it has consequences on the aesthetic experience of populations, providing a one-dimensional vision of what is right and good, wiping out the diabolic, grotesque plus dread feelings which constitute the production of senses and the aesthetic sovereignty.

Campesino Feliz

The category of *campesino* has an ultimate importance in the action of ACPO and Radio Sutatenza. Its definition, nonetheless, is depreciating and detractive as it tends to view the *campesinato* as a group who needed protection coupled with instruction. Gutierrez defines this specific category of radio interlocutor as:

lo no urbano, lo no moderno, lo tradicional; un pueblo incomunicado, avergonzado de sí mismo, olvidado, despreciado, conformista y minifundista; pero, al mismo tiempo, un pueblo religioso, trabajador, amante de la radio y de la música, capaz de transformarse y de transformar, de educarse y educar; una fuerza histórica.⁴⁵⁵

The idea of Christian education is tied to the value of peasant’s life inner aspects and the process of aesthetic adaptation is constant in religious education, as noted by Richardson:

454 “the streets indicate basically the world, with its improvisations, accidents and passions, whilst the house, lead to a controlled universe, where things are in their right places (..) thus, the social groups that occupy the house are radically diverse from those out on the streets”. Roberto da Matta, *Carnaval, Malandros e Heróis* (São Paulo, Rocco, 1997) p. 90.

455 “The non-urban, the non-modern, the traditional; An incommunicado population, ashamed of itself, forgotten, despised, conformist and minifundists; But at the same time a religious, hard working people, lover of radio and music, capable of transform itself and transforming, educate itself and educate; A historical force.” Hernando Vaca Gutiérrez, ‘Procesos interactivos mediáticos de Radio Sutatenza con los campesinos de Colombia: 1948 – 1989’. in *Signo y Pensamiento 58: Documentos de investigación* (vol. XXX. Jan-Jun 2011) pp. 254-269, p. 259.

“Religious educators, more so than general educators, stand in a position to observe and facilitate encounters with the unknown, the strange or ineffable”.⁴⁵⁶ Abrahan Moreno lists a number of cultural expressions and social constructions⁴⁵⁷ integrated by the work of Father Salcedo and ACPO through mass media technology, claiming the recognition of the priest as “one of the highest artificer in the construction of the concept and sentiment of the nation”, for he was able to mix, as a cultural policy, many cultural expressions present in Colombian life:

logra integrar la gastronomía de la costa con el cine bogotano, la copla boyacense con la leyenda llanera, la música del eje cafetero con el humor opita, la pintura valluna con el teatro antioqueño, la escultura santandereana con la poesía amazónica, la danza pastusa con la literatura insular, la fotografía sanandresana con el deporte chochoano, la artesanía guajira con las costumbres caquetenses.⁴⁵⁸

The importance of national identity is here tied to not only the apostolic but also political mission and its inherent duty to integrate the different under the same universal principle. It recalls the Catholic arguments for the conquest fostered and incorporated by radio and its power as a modern technology for national integration. The interpretations over the fragile condition, timidity, weakness and ignorance in which the *campesino* lived as well as its cultural interaction, produces the positive potential of *mestizaje*, addressed in these terms by Salcedo:

Sin lugar a dudas, el mestizaje de la América Latina, que no es solamente genético sino principalmente cultural, es uno de los elementos que operan en parte como mecanismos de retroceso pero también como aceleradores del cambio. El dualismo, entendido no solamente como confrontación sino como interacción y proceso de fusión y amalgama, crea un dinamismo propio de la cultura.⁴⁵⁹

The study of the synthesis from cosmological interchanges as a beneficial cultural aspect and a political form for Latin America is addressed famously by José de Vasconcellos. As a Mexican

456 Christopher K. Richardson. ‘Encountering the supercalifragilisticexpialidocious: The roles of art in religious learning’. in *Journal of Adult Theological Education* (vol. 6, Issue 2, 2009). p. 6.

457 “Escuelas Radiofónicas, asociaciones agrarias y pecuarias, Organización de tiendas comunales, asociación de líderes; construcción de escuelas, fundación de veredas, construcción de caminos y puentes; aprendizaje básico, lectoescritura, huertas caseras, superar el problema de nutrición, equipos deportivos, organización de juntas veredales, construcción de campos deportivos, construcción de acueductos, fundación y organización de bandas musicales, mejoramiento de viviendas, reforestación” Luís Abrahán Sarmiento Moreno, *ACPO, Una experiencia Educativa: Desarrollo integral de la humanidad. Pensamiento educativo del monseñor José Joaquín Salcedo Guarín* (Tunja: UNAD, 2009). p. 233.

458 “It manages to integrate the gastronomy of the coast with the Bogota cinema, the *boyacense copla* with the llanera legend, the music of the coffee axis with the opita humor, the *valluna* painting with the *antioqueño* theater, the santandereana sculpture with the Amazonian poetry, the pastusa dance with insular literature, Sanandresana photography with the Chocoano sport, the Guajira handicraft with the Caquetenses customs.” Luís Abrahán Sarmiento Moreno, *ACPO: Una experiencia Educativa*, *ibid.* p. 340.

459 “Undoubtedly, the mestizaje of Latin America, which is not only genetic but mainly cultural, is one of the elements that operate in part as mechanisms of regression but also as accelerators of change. Dualism, understood not only as a confrontation but as an interaction and process of fusion and amalgam, creates a dynamism proper to culture”. José Joaquín Salcedo Guarín, Bernal Alarcón and Hernando Gutiérrez, *América Latina Interrogante Angustioso*, (Bogotá: Planeta, 1992). Quoted from Moreno, *ibid.* p. 117.

thinker and politician, he inaugurated the controversial and largely debated idea of “Raza Cómica” (cosmic Race), a biological as much as spiritual synthesis of all the “four racial trunks: the Black, the Indian, the Mongol, and the White”. Latin Americans would then be responsible to fulfil the task of synthesizing humanity in a new epistemological and human consolidation, to “consummate the mission” regarding “the triumph of fecund love and the improvement of all the human races”.⁴⁶⁰ The cosmic deals with a spiritual cause, shifting “the semantic weight from the material to the spiritual, from corporeal, to aesthetic mestizaje”.⁴⁶¹ The complex and multiple discussion on *mestizaje* in Latin America had its apogee in the twentieth century, although it continues to be examined in different trends and perspectives. Throughout the last century, the notion went from a physical, biological notion to an aesthetical, political discourse.⁴⁶² Just as the view of “race as an attitude”, proposed by Leopoldo Zea in his reading of Vasconcelos, we find many references to *mestizaje* as a “posture”⁴⁶³ or as a “praxis”: a form of bricolage.

In an investigation published on *Revista Folklore*, which released its first edition in the same year which Sutatenza was firstly aired, Diego Suárez argues that in this period the magazine was primarily concerned in solidifying that “given the political, economic and cultural centrality of the Andean region in the national space (...), the representative of the nation in sociocultural terms was the Andean *mestizo*”,⁴⁶⁴ while obliterating the importance to black and indigenous populations.⁴⁶⁵ The magazine constructed mestizo image as a synonym of the “national” and sought to smoothly oversee Colombian social contradictions. Colombian private radios fostered music from the Andean region and “the first genres of Atlantic music” whereas *Radiodifusora Nacional* presented a “lettered media” to deliver “high culture” in its mission to “civilize the musical taste of the masses”.⁴⁶⁶ This desired “mestizo nation”, intended to integrate the black and the Indian population

460 José Vasconcellos, ‘The Cosmic Race’, in *The Mexico Reader: History, Culture, Politics*, ed. by Gilbert M. Joseph and Timothy J. Henderson (Durham: Duke University Press, 2002), pp. 16 – 19.

461 Marilyn Grace Miller, *Rise and Fall of the cosmic race: The cult of Mestizaje in Latin America* (Austin: University of Texas Press, 2004), p. 29.

462 See: Stefanie Wickstrom, Philip D. Young (eds.), *Mestizaje and Globalization: Transformations of Identity and Power* (Tucson: University of Arizona Press, 2014).

463 See: Francois Lionnet, *Autobiographical Voices: Race, Gender, Self-portraiture* (Ithaca: Cornell University Press, 1989).

464 Diego Fernando Buitrago Suárez, ‘Nación mestiza: el caso de la Revista de Folklore en Colombia: 1947-2011’, in *Anuario Colombiano de Historia Social y de la Cultura* (vol.44 n.1, 2017) pp. 279-302. p. 283.

465 Catherine Walsh criticizes this perspective from a ‘decolonial’ view in terms that “the hegemony of Eurocentrism as the perspective of knowledge, and an association of intellectual production with ‘civilization’, the power of the written word, and with the established racial hierarchy (Quijano 2000). In this construction and its maintenance over more than 500 years, indigenous and black peoples are still considered (by dominant society but also by the white-mestizo Left) as incapable of serious ‘intellectual’ thinking. It is in this context that the eurocentricity and racialized character of critical thought takes form. Still, the construction, logic, and use of a critical thought have long existed amongst indigenous and Afro-descendent peoples, although Latin American philosophers, social scientists, and leftist intellectuals have seldom recognized or valued its existence”. Catherine Walsh, ‘Shifting the geopolitics of critical knowledge’, in *Cultural Studies* (vol. 21, Issue 2, 2007) pp. 224 – 239, p. 229.

466 Diego Fernando Buitrago Suárez, ‘Nación mestiza’, *ibid.* p. 286.

presenting the successor of the *criollo* as the cultural carrier of the nation's expressions: "The *mestizaje* implied the legitimacy of colonial hierarchies orienting them towards the modern state in culture, seeking its affirmation as a place where converges, in a non-conflicting way in its order, the Hispanic inheritances and in subordination to the indigenous and African contributions".⁴⁶⁷

It was *musica campesina* (peasant music) which was the musical genre thrived and fostered by Sutatenza, following the line of approaching the rural, popular socio-cultural environment which ACPO was trying to, at once, celebrate and overcome. In *tabernas*, *fiestas* (parties) and workplaces, *Guasca*, *guabina*, *torbellino*⁴⁶⁸ and later, the *Carranga*⁴⁶⁹ musical genres, were descriptive songs which celebrates the geography of the place, the character and good will of the rural population. What ACPO has done was to adapt, reverberate, translate and carve this expression according to its objectives.

The musical focus privileged local, popular and folk genres instead of classical or ecclesiastic chants, for the openness to *campesina* music seemed to be a central aesthetic strategy to reach the pedagogical and cultural process chosen by the catholic church to interact with the rural population. Cultural processes which blend theology with music are constant strategies in the attempt to convert souls to Christian belief. In the United States, Calvinism alongside its individualistic ethics, allowing people to speak, yell and make individual oral connection with God provided improvisation in religious services in detriment of the unison Gregorian chants, what allowed the development of Gospel music, soul music and all its ramifications in black USA musical culture. The primitive and diabolic Blues, however, flourished from the *tabernas*, in the hard work on the fields and plantations.

Besides fostering the creation regarding a number of musical groups from the community, music was used as an aesthetic resource in order to "improve" their communicative qualities as well as to reconquer the space of the *fiesta* in which happiness, fun and fruition in good manner would replace the anterior environment of the *tabernas*.⁴⁷⁰ Those aesthetic strategies assumed the lack of

467 "El mestizaje implicó la legitimación de las jerarquías coloniales orientándolas hacia el Estado moderno en la cultura, procurando su afirmación como lugar donde confluyen, de manera no conflictiva en su orden, las herencias hispánicas y en subordinación los aportes indígenas y africanos". Diego Fernando Buitrago Suárez, 'Nación mestiza', *ibid.* p. 297.

468 This type of music is also connected to the work on the fields, especially in the boom of Coffee in Colombia. Workers known as *Jornaleros*, who were nomads travelling through the countryside in order to sell their workforce to plantations used to carry guitars, acting as sorts of Troubadours, composing and singing about their reality.

469 For an analysis of the connection between the landscape and Carranquera Music, see: Felipe Cárdenas and Monica Montes, 'Narrativas del paisaje andino colombiano: Vision Ecologica en la musica Carranquera de Jorge Velosa', in *Revista de Antropología Iberoamericana* (vol. 4, n. 2, May-Aug 2009), pp. 269 - 293.

470 "La música recuperó el espacio de la fiesta en el mundo campesino, despertó la alegría y la diversión, y apoyó el desarrollo de la competencia comunicativa" (The music had recovered the space of the party in the peasant world, sparked the happiness and joy, and supported the development of their communicative competences). Hernando Vaca Gutiérrez, 'Procesos interactivos mediáticos de Radio Sutatenza con los campesinos de Colombia', *ibid.* p.

“interpretative autonomy” from the part of the *campesinos*: “*Las competencias interpretativas de los mensajes, (...) fueron frágiles, debido a su escasa formación, a las características de su ethos cultural y de su contexto de incomunicación.*”⁴⁷¹

Efraín Medina Mora was a musician who collaborated with the radio as well as the composer of the “hymn of radio schools”. He worked with Salcedo in order to give musical lessons so the peasants themselves could compose and sing folk music with lyrics celebrating the mission of ACPO. In the album “*Colombia campesina canta*”⁴⁷² (Peasant Colombia sings), where there are 12 themes selected by the radio to be recorded, there is a strong presence of the value of work ethics, the new life style, the landscape, the engagement in the “project” to no mention the “opportunity” to get out of “ignorance”.

In the songs, life and landscape are, at the same time, valued and celebrated but also presented as a primitive stage of development to be overcome. They combine themes of cheering and lament, as it is usual to popular and folk music of rural regions. In “*Campesino Feliz*” (Happy Peasant), the celebration of the life in the fields is mixed with the harsh condition which should be left behind: “How happy I feel to be a peasant, (...) even though my hands get bloody every afternoon I do not change my field for any city”. The landscape is a motif for the pleasure of life on the countryside, which allows “breathing fresh air”, “see beautiful mountains and beautiful coffee plantations”. The peasant “never have regrets” for working on the fields because he can enjoy the cultivated fruits of his own work. The private life and the peculiar life style comes from the care and passion for the “little house in the mountains without which my soul is useless” (Lucrecito Oriental) and the nature comes as a gift, in the celebrated “crystalline waters that irrigate the region of the mountain range” (Rio Amaime).

In “*Así Estamos*” (That’s how we are), the underestimation of the peasant nature is mentioned whereas the only hope for escape from that rude life is the engagement in community actions: “*We continue being the same / as long as we do not educate ourselves / they will continue to oppress us / We remain the same / We lack study and money / we are always exploited / and we can defend ourselves / by being well organized*”. In *Líder Comunitario* (Community Leader), cheering words also foster the engagement to leadership within the borders of the mission since “illiteracy is finishing”, and claim the population to “seize the opportunity to get rid of the ignorance” and go “ahead with the project so all Colombian population can be important”.

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471 “The interpretative competences of the messages (...) were fragile, due to their scarce formation, their cultural ethos characteristics, and their context of uncommunication”. Hernando Vaca Gutiérrez, ‘Procesos interactivos mediáticos de Radio Sutatenza con los campesinos de Colombia’, *ibid.* p. 265.

472 The album is available in a Youtube video at: <<https://www.youtube.com/watch?v=V70KkAlgiaE>>

The vision of a pre-modern life, combined with many necessities of the rural life and the vocational mission of the modern national church made UNESCO to state that “Radio Sutatenza may be all that a *campesino* ever hears from the *rest of the world*”. The question here is the idea that a *campesino*, to improve their life conditions together with thriving in the direction of citizenship, should be filled with information and guidance coming from the “rest of the world”. Similar to that “cultural policy” for inclusion which measures the development of the margins by the status of the high “spirit” of modern, industrial and urban world, the colonial idea contained in the Sutatenza project is heir of the platonic soul and the Hegelian spirit adapted by the Latin American reality under catholic influence. Instead of an heterologic project of giving voice in order to learn from the other, Sutatenza chose to inflict education so the ‘primitive’ could become ‘modern’. The new notion for the spectrum’s order which established the technical, economic, political and regulated condition for its use, inflicted a radioactive method of colonial submission as a noble pedagogical instrument for reception. In this sense, the idea that “the greatest sin is the ignorance” means that salvation must come from the church, modern achievements and civilized instructions directed to, in the words of Fraser and Restrepo-Estrada, a “crusade for progress”.

Final Remarks

Contrary to that policy of access, tolerance, integration and instrumentalization, Michel de Certeau proposes an other-centred, amateur and ordinary perspective, seeking for a hospitable place for other voices in what Highmore calls a “desire for foreignness [which] is profoundly xenophilic”.⁴⁷³ This option includes a different aesthetic quality, which sees culture as inseparable from the acts pertaining to the everyday life as it proposes an ethical choice to “guard against the cultural pacification of heterogeneity”,⁴⁷⁴ preventing the homogeneity and alienation carried by mass culture. The foreigner, the other, the amateur or the immigrant would force Western society to abandon “familiar points of reference” and adapt “other codes and acquisition on new ways of thinking and acting”.⁴⁷⁵

This cultural policy privileges heterogeneity over identity or tolerance furthermore, it is constructed as practical knowledge and experimentation, “allowing spaces and communicative forms where otherness and heterogeneity could proliferate”.⁴⁷⁶ An alternative media together with

473 Ben Highmore, *Michel de Certeau: Analysing Culture* (New York: Continuum, 2006) p. 155.

474 Ben Highmore, *Michel de Certeau*, *ibid.* p. 150.

475 Michel de Certeau & Luce Girard. *The capture of speech and other political writings*. (Mineapolis: Univerity of Minnessota Press, 1997) p. 133.

476 Ben Highmore, *Michel de Certeau*, *ibid.* p. 161.

ordinary practices when combined, form a communicative tactical operation of resistance, should constitute elements for the formation of this policy, which identifies the borders of the Nation State and the ruling of the cultural market as obstacles for its fulfilment.⁴⁷⁷ As to remedy the “uneven distribution of knowledge”, Certeau conceives the cultural practice as an epistemic and ethical project in the form of a production based on the “moves with that marks of an idiom, a tradition, usages, tastes and behaviour that are not familiar and in which we fail to see ourselves”.⁴⁷⁸ Radio is cited by Certeau as a form by which “groups that have been silent (...) can reappropriate for themselves the space of public speech”,⁴⁷⁹ which opposes to a passive manner of using media employed by Sutatenza, Nation States or the United Nations. In this sense, a tactical posture regarding resistance is opposed to a strategic and pre-formatted structure of national identity, global values as well as industrialized culture. Gestures, behaviours and techniques of the body and the concrete life should be tied to city spaces “for speech making” and “festivals of orality and writing” where unregulated experiments are appropriated by practices that reveal the other. We notice that Sutatenza, in accordance with the general mind-frame towards the use of electronic media, followed the path of induction, teachings and domestication, which is a tradition carried by the use of language (written, spoken and sung) dated from the first moments of the encounter with the other and used to tame aesthetic expressions. Thus, the awareness over the codes and explanations regarding expressions’ outcomes seems here a fundamental aspect for the political struggle over media sovereignty.

Certeau identifies the importance of orality in his “archeology of ethnology”⁴⁸⁰ – designed to research French travel accounts on Brazilian ethnic groups during the 16th and 17th centuries – in order “to show how a science of man is detached, modified, and specified between the rupture of the Renaissance and the end of the Enlightenment”.⁴⁸¹ This “heterology”, understood as a science of the other along with the status of his voice, also instructs “Practices of Everyday Life” by putting the emphasis on the common, ordinary plus the mundane that “only comes to signification as a fragment that points to something else that is un-recordable”.⁴⁸² The elements of orality, speech, voice and sound are opposed to what he refers as a “scriptural economy”,⁴⁸³ for it engages a change

477 In the case of France, Communication and Culture are part of the same governmental body since 1978, the *Ministère de la Culture et de la Communication*, having had other assemblages until 1997, when it got the name and functions that remain up to now.

478 Michel de Certeau & Luce Girard, *The capture of speech*, *ibid.* p. 133.

479 Michel de Certeau & Luce Girard, *The capture of speech*, *ibid.* p. 123.

480 Michel de Certeau, *The writing of history* (Columbia University Press, 1988). p. 211.

481 Michel De Certeau, ‘Travel Narratives of the French to Brazil’, in *Representations* (n.33, Special Issue: The New World, 1991). pp. 221-226, p. 222.

482 Ben Highmore. *Michel de Certeau*, *ibid.* p. 73.

483 “The installation of a scriptural apparatus of modern ‘discipline’, a process that is inseparable from the ‘reproduction’ made possible by the development of printing, was accompanied by a double isolation from the

in the experience of the listener and unfolds a specific ethics of communication centred in “an originary plenitude of ordinary culture, marked by an unmanageability of heterogeneous voices”.⁴⁸⁴ The elaboration of a “tactic” of the other through their voices not to mention the changes that it produces to oneself comes from his previous searches on possession, mysticism and the “strangeness of history, the reflexes triggered by its alteration” which weaves “new social figures of the other”.⁴⁸⁵

Here, the distinction between writing and orality plays a crucial role for it opposes the linear ordination of Western visual and textual culture to a sonic and distorted amateur expression of the ‘other’. In this sense, strategy is linked to a dominant ‘scientific’ codified method, framed by rational thought and legitimized by the instruction of the enlightened knowledge. Tactics, by contrast, would be the enactment of the unknown, practices based on stories, myths and legends unconfirmed or de-legitimized by scriptures. Orality appears as a tactical choice to the counter-conquest which challenges Western thought forcing the scriptural status quo to alter itself, stunned and disrupted from within

The tactical heterological method and principles embraced by Certeau to examine such conflicts of knowledge embodied in the communication is based on Ampère’s concepts for “ethnology”: orality, spatiality, alterity and unconsciousness. From those, Certeau draws its oppositional elements: writing, temporality, identity and consciousness, stating that “The ‘difference’ implied by orality and by the unconscious delimits an expanse of space”.⁴⁸⁶ Contrarily, the Western “procedures without speech” play the strategic role of constituting savages reserves for enlighten knowledge which, by elaborating a “discourse which organizes manners of thinking in manners of doing”,⁴⁸⁷ ordines the savoir-faire by the dominant knowledge, transforming the absence of such procedural regulations in the control of the other’s practices.

Such attempt was partially made by the “theology of liberation”, connected to social movements including geopolitics from the global south which advocates for people’s struggle and the prominence of the poor population from the ‘margins’.⁴⁸⁸ Drawing from such perspective,

‘people’ and from the ‘voice.’” Michel de Certeau, *Practices of Everyday Life* (Berkeley: University of California Press, 1988) pp. 131-132.

484 Ben Highmore, *Michel de Certeau*, *ibid.* pp. 73.

485 Michel de Certeau, *Possession of Loudun* (Chicago: University of Chicago Press, 2000). p. 228.

486 Michel de Certeau, *The writing of history*, *ibid.* p. 210.

487 Michel de Certeau, *A invenção do Cotidiano: Artes de Fazer* (Petrópolis: Vozes, 2002) p. 136.

488 See: Enrique Dussel, *Ethics and the theology of liberation* (New York: Orbis Books, 1978); Eleazar S. Fernandez, Fernando F. Segovia (eds.), *A Dream Unfinished: Theological Reflections on America from the Margins* (Eugene: Wipf and Stock Publishers, 2001).

Roberto S. Goizueta emphasizes the praxis of popular folklore and the everyday experiences of a community as a form of aesthetics:

praxis is revealed as not only inherent communal, but also inherently celebratory, or aesthetic. The centrality of music, dance and ritual in Hispanic life reveals the aesthetic sense underlying that life. Insofar praxis is an affirmation of community, is an affirmation of community as the highest form of beauty. Popular religiosity reveals praxis as a communal, aesthetic performance.⁴⁸⁹

Thus, instead of the role of the religious education as a translation of the universal values of Christianity into a foreign language and cosmology, he proposes a dialogic experience based on praxis along with material life. Thus, he questions the heritage of Cartesian and Kantian epistemological paradigms, its creation of false dichotomies and forced separation of spheres of sensuous experiences. Instead, he advocates for a praxis which understands and interiorizes non-Western forms in reference to world views: “That praxis reflects an instinctive and implicit repudiation of the conceptualist dichotomies underlying modern, Western anthropologies and epistemologies, whether dichotomies of mind-body, intellect-affect, or individual identity – communal identity”.⁴⁹⁰

In this sense, spiritualism, worship and general matters of religion, could be learned from the exploration of the community’s “special pathos of beauty”, which could facilitate “interculturalism” in dialogic mode, as if aesthetics had the power to communicate, interact and “make possible an authentic inter-subjectivity (...) through the aesthetic pathos, which in turn makes possible the empathic fusion of subjects [and] relate to others as ‘others’ rather than as merely objects of knowledge or action”.⁴⁹¹ A form of blending everyday life with the aesthetic sense of rites, celebration and praxis, according to Goizueta, comes as to sacralise times of play in the form of *fiestas*, which are described as:

(1) an expression of *communitas* (2) human action in “subjunctive” mood (3) the confluence of play and work (4) a form of liturgical action... As an action of reception and response for the gift of life, the *fiesta*, - whether expressly civil or religious – is a fundamental religious act.⁴⁹²

The catholic colonization built a style for the art of the conquest and, therefore, cracked open another one for the counter-conquest. For Levinas, the act of listening and “being for the other” reveals a disruptive aesthetic experience distinct from some regular artistic perspectives (here he is

489 Roberto S. Goizueta, *Rediscovering praxis*, p. 67, quoted from Eduardo C. Fernandez, *La Cosecha: Harvesting Contemporary United States Hispanic Theology* (1972-1998) (Collegeville: Liturgical Press, 2000) pp. 143 – 144.

490 Roberto S. Goizueta, *Challenge of pluralism*, p. 18, Quoted from: Fernandez, *ibid.* p. 144.

491 Roberto S. Goizueta, ‘La Raza C6smica? The Vision of Jos6 Vasconcelos’ in *Journal of Hispanic/Latino Theology* (vol1, n.2, 1994), p. 19.

492 Roberto S. Goizueta. ‘Fiesta: Life in the Subjunctive’, in *From the Heart of our People: Latino/a Explorations in Catholic Systematic Theology* (New York: Maryknoll, 1999) pp. 84 – 99, p. 91.

criticizing the surrealism) that dwells “purely and simply at the heart of his own spectacle, like an artist”.⁴⁹³ The act of speaking as well as the receptive contact with the other becomes a pedagogical process related to the power of the divine word: “The presence of the Other (Autre) is a presence that teaches us something; this is why the word, as a form of education, amounts to more than the experience of reality, and why the master of the word is more than a spiritual obstetrician”.⁴⁹⁴

Nonetheless, the role of radio Sutatenza, described in this chapter, shows the ambivalent role perpetrated by the use of orality and music as well as demonstrates how radio reveals a set of influences from the cultural along with the spiritual colonial environment. The Catholic mission, although marked by a will to understand the other and to use its cultural reserves to elaborate its modern project, did not abandon the “scriptural” practices related to the patronizing cultural policy for media developed early in the twentieth century. Its political and economical engagements, following the ethics initiated at conquest, moved closer to the institutional and political order as to fulfil the strategy of educating and modernizing. The landscape created by the radio as a strategy was not only constructed but also enchanted by this policy. The exploration of popular music, the opposition between open and closed spaces and the national identity of the *campesino* as epithet of mestizaje led the Catholicism, despite the possibility of engaging with the other, to a policy of tutelage as well as the aesthetic control.

The Catholic sermons were used as an apparatus for aesthetic domination and as a justification for their acts towards the natives. The contact with the “other” not only opened the range to the possibility of the expansion of its own cosmology but also introduced the creation of new forms for colonial “cultural policies”. In this process, orality, words and meanings took the form of an aesthetic conflict that would permeate the debate around the idea regarding culture, nation, modernity and civilization. Radio as a controlled form of power over the conceptions of the spectrum assumes its role as an instrument of patronage, tutelage, and pedagogy in the hands of a church that articulates the connections between the deformations of the earthly reality and the heavenly teachings.

In this process, the use of radio appears as a recent and colonial “technological extension and attunement of the ear”⁴⁹⁵ through which the Christian “auditory discipline” provides “conditions for modernity’s unique forms of reason and experience”. The appropriation and repositioning of the church happened in the face of the effects of the eighteenth century seances which provided

493 Emanuel Levinas, ‘The transcendence of words’, *ibid.* p. 149.

494 Emanuel Levinas, ‘The transcendence of words’, *ibid.* p. 148.

495 Charles Hirschkind, ‘Cassette sermons, aural modernities’ in *The Sound Studies Reader*, ed. by Jonathan Sterne (New York: Routledge, 2012) p. 64.

auditory experiences from “oracular voices, the whispering of demons, the ringing of invisible bells”,⁴⁹⁶ is analogous to the role of Radio Sutatenza as a technology “essential to the formation of the sensory dispositions and aptitudes characteristic of a modern secular subject”. Its pedagogical aspects refer to the discipline which, in the 17th and 18th century, “aimed at educating the senses in the service of polite sociability, civic virtue, and scientific knowledge”.⁴⁹⁷

Music and private space, in symbioses with the quality of radio-waves emissions, are tamed and transformed into instructions that must remedy savage rites. As a case of acculturation opposed to tobacco’s transculturation (which went from a diabolic nature to aesthetic and medicinal virtues), the radio appears as a Pharmakon that relieves and poisons; stimulates and heals. Catholicism then links to the idea of *mestisaje* as a self-justification and from it, learns, adapts and begins to consider the rites and cultures as a formative part of a political theology in which interculturation and dialogic modes of communication are represented by liturgical actions as a subjunctive mood.

The discussion over a “decolonial aesthetic” has timid approaches in terms of conceptualizing the interconnection among life practices, transculturation, forms of expression and the political consequences of this sort of conceptual perception which flourished from the harsh experience of practical and ordinary life. I believe that it is worth embracing the phenomena as a general practice of material and symbolic life which includes cross-references from the many elements which composed the social cultural American complex, as it is possible to draw from an analysis of radio communication and modes of spectrum usage along with the perception over it.

The experience of Sutatenza was driven by the call of Christianity of Salcedo’s “grandiose and divine obsession”.⁴⁹⁸ Radio was a strategic tool which imprinted magic and divine features in order to deliver a modern mission to create fanciful behaved mestizo amidst a rural landscape formed by a savage and diabolic influential ancestry. However, it shows the openness to alternative constructions which indicate a progressive politics within the same realm of religious philosophy. Many of the recent policies towards “community radio” still undergo such pedagogical and patronized practices, as they see radio practice within the context of legal, institutional and educational frameworks.

In such sense, the connection between wireless communication and the spiritual light, mentioned in Chapter 2, can be noted through the ideas of revelation, truthful mandate and the illumination of souls, which were used either by UNESCO and Radio Sutatenza to argue and

496 Charles Hirschkind. ‘Cassete sermons, aural modernities’, *ibid.* p. 64.

497 Charles Hirschkind. ‘Cassete sermons, aural modernities’, *ibid.* p. 72. See also: Leigh Eric Schmidt, *Hearing Things: Religion, Illusion, and the American Enlightenment* (Cambridge: Harvard University Press, 2000).

498 Colin Fraser & Sonia Restrepo-Estrada, ‘The quick and the dead’, *ibid.* p. 153.

convince of this religious and telluric mission and an imperative from God's command. If light made viable the communication with god and part of the mission of its representatives, the conceptions of radio, its functions and properties should follow the idea by which the truth and the good can also be transmitted through radio waves.

Chapter 6 – Counter Colonial Landscapes

Soon after Marconi's experiments with radio, Jesuit⁴⁹⁹ priests of *Colegio San Calixto* of La Paz, headed by Priest José Clerk, in 1897, were able to transmit radio signals.⁵⁰⁰ In 1912, according to Priest José Gramunt,⁵⁰¹ Calixtine Friar Pierre Descortes and Francisco Cerro were able to make a wireless transmission with scientific and pedagogical purposes from La Paz to Viacha, 32 Km away from the capital.⁵⁰²

In 1921, the first commercial station of Bolivia was inaugurated by the brothers Rodolfo and Enrique Costas. In March 1929 *Radio Nacional* started to air as an official broadcaster of the Bolivian state. With a transmitter of 1000 Watts and a licence granted by the *Dirección Nacional de Correo y Telegrafos* (National directive of mail and telegraphs) the radio began to broadcast for 150 receivers in order to compete with *Radio Nacional* from Argentina, from where the signal could reach Bolivian territory. A group of businessmen and entrepreneurs of the mining industry, through the *Centro de propaganda y defensa nacional* (centre of propaganda and national defence), bought a powerful transmitter that was later offered to Radio Illimani in 1933, which became the official radio of the Bolivian State after Radio Nacional was merged with it in 1937. Radio Fides, a pioneering experiment of catholic radio – alongside Sutatenza – and today a large news and publicity agency of Bolivia, started its activities in February 1939.

The period of radio flourishing in Bolivia, however, did not start before the end of the Chaco War (between Bolivia and Paraguay from 1932 to 1935), a conflict in which the nationalist motif did not make sense for the indigenous soldier of Bolivia, who “remained bewildered, homesick, and hardly aware of what he was doing, let alone for what”.⁵⁰³ The conflict, lost by Bolivia, was fought for the control of the Chaco region, rich in petroleum and *quebranto* (shinopsis), both natural resources prospected and desired by companies of Argentina, such as Carlos Casado S.A.⁵⁰⁴ and Standard Oil, from the USA.

499 Clerics affiliated with the Society of Jesus, a Catholic order founded in Spain by Ignatius de Loyola in 1534.

500 See: Donato Rojas, ‘Las Radios em Bolivia’, in *La Patria newspaper*, 16/01/2011.

501 See: ‘La Radio en Bolivia’, in *Revista Boliviana de Comunicación* (La Paz: n.9, 1986).

502 José Luis Aguirre Alvis, ‘La radio boliviana en el largo trayecto de educar contando historias: El caso de programa voces nuestras’, in *Ciencia y Cultura*. (La Paz: Universidad Católica Boliviana, n.36, 2016) p. 86 - 87.

503 James Malloy, *Bolivia: The uncompleted revolution* (Pittsburg: University of Pittsburg Press, 1970) p. 74.

504 “Carlos Casado S.A. es un empresa Argentina que tiene sus inicios en 1883 cuando Don Carlos Casado del Alisal adquiere una gran extensión de tierras en el chaco paraguayo a 500km. al norte de Asunción, la capital de Paraguay y 2.300km de Buenos Aires, la capital de Argentina. Don Carlos Casado instala la fábrica de tanino en Puerto Casado y comienza a funcionar la primera fábrica de extracto de quebracho (tanino) de America, convirtiéndose en una de las más grandes del mundo, produciendo hasta 2400 toneladas de tanino mensuales que son exportadas principalmente a Europa y USA. La fábrica de tanino funciona hasta el año 1996. Asimismo a partir de 1886 comienza la explotación de montes para la fábrica de tanino y durmientes para ferrocarriles que son exportados a Europa.” From Carlos Casado website. Available at: <<http://www.carloscasadosa.com/es/historia/>>.

In the 1940', Bolivian Economy was controlled by what is known as "Tin Barons" or *rosca minera*, an oligopoly formed by three families – Patino, Aramayo y Hochschild – who controlled the extraction of metal and had great influence over the Bolivian government, similarly to the system of exploitation carried out in the times of colonial regime. The colonial economic system which provided the birth of modern capitalism relied on the ownership of land and people and in the exploitation of natural resources and knowledges. In the presentation of the project "Principio Potosí" written in the *Carta* magazine of *Reina Sofia* Museum, one reads that "modernity did not start in America with enlightenment (illustration) but with the silver mines and its inhuman commerce and exploration".⁵⁰⁵

Jorge Mancilla Romero, who had taken part in *Radio Vanguardia* (a clandestine radio from the Colquiri mine district), states that Bolivia was "one of the few Latin American countries where the labour organization had succeeded in appropriating the electronic technologies of communication".⁵⁰⁶ Romero indicates that the radio phenomena started as a necessity of reconstruction and national unity after the end of the Chaco War, since that, previous to the conflict, Bolivia was a State "incomunicado and divided by regions".⁵⁰⁷ The suffering caused by the war took poor Bolivians and Paraguayans to engage in recognition with themselves and a good part of this was "through the poetries, songs and tales of the Chaco War".⁵⁰⁸

The consequences of the war, however, forced a cultural sentiment of union and gave birth to revitalized political movements, incorporated by the *Movimiento Nacional Revolucionario* (MNR) which led the country, in 1954, to a revolution which "signified a radical amplification of the space of political participation and (...) an institutional project of political inclusion of new social groups".⁵⁰⁹ As a multi-class and largely supported revolution, it universalized the right to vote, centralized the administrative instruments in the hands of the State, enlarged the education system valuing the Spanish as a nation-unifying language, imposed an agrarian reform restricted to the *altiplano* and the region of Cochabamba and nationalized the mining industry.

Beginning in the mid-40' the radio experience from mines workers of the Bolivian *altiplano* went from an amateur beginning to relative autonomous functioning and social recognition going through a period of repression during the two Bolivian military dictatorships of the period.

505 'Portada: Principio Potosí', in *Carta: Revista de Pensamiento y debate de museo nacional centro de arte reina sofia*. (Madrid: n.1, Winter-Summer 2010) pp. 29.

506 Héctor Schmucler & Orlando Encinas, 'Las radio mineras de Bolivia: Entrevista con Jorge Mancilla Romero', in *Comunicacion y Cultura em America Latina* (Mexico DC: Universidad Autonoma Metropolitana, vol8, n.8, 1982), p. 69.

507 Schmucler & Encinas, 'Las radio mineras de Bolivia', *ibid.* p. 70.

508 Schmucler & Encinas, 'Las radio mineras de Bolivia', *ibid.* p. 71.

509 Alfredo J. C. J. de Camargo, *Bolivia, a criação de um novo país* (Brasília: FUNAG, 2006), pp. 149-150.

Differently from the model employed by ACPO, planned and conducted independently from its beneficiaries and listeners, “the miners’ radio were not a project thought and executed by a political party or union (...) but an initiative of the workers themselves”.⁵¹⁰ The radios were communitarian spaces or cultural centres responsible to interact the cultures of urban centres with rural areas and a “unique example of a truly participatory process right from its inception”.⁵¹¹

The relation with the mined mountains filled with valuable metals demonstrate the connections between historical and present colonialism, the cosmological constitution of the landscape and the political need to resist aesthetic domination. Below, I should explore some arguments which form this conception of geological aspects of media so we can illustrate some relations between colonial exploitation and fundamental fragments for the formation of a counter-colonial politics of media.

Considering the strong presence of traditional language and culture in the *altiplano* – heritage from *Quechua* and *Aymara* civilizations –, the fact that the cosmology surrounding nature and territory (as addressed in the section “The Andes: Stone, Mountains and Territory” from the first chapter) is strongly present in the population’s daily life must be considered. In that sense, the analysis of the radio experiences considers the colonial aspects related to the mode of observing the space, the natural landscape and the process of communication. Furthermore, I examined the perspectives related to the importance of Potosí’s *Cerro Rico* and the symbolic nature that it enacts since colonial times. This picture would guide me to a discussion about “geo-media”, proposed by Jusi Parikka and the argument that media criticism based on environmental discussions should consider the colonial aspects in order to embrace the complexity of its economic and political problems. Another feature of this chapter is a document reporting the presence of a number of illegal radios in Bolivia to the ITU. The document, although demonstrates empathy and knowledge of the author concerning the harsh situation of Bolivians at the time, shows not only a prejudice against the simple population and the rough constitution of the radios, but also demonstrates a vision in which the technical and regulatory aspects regarding the emissions appear as more relevant than the social importance of the radios. Thus, the argument of this thesis in which the technical and regulatory aspects of the radio waves undermine aesthetic expressions and are used to justify repressions becomes again documented.

510 Alfonso Gumucio Dragon, *Las Radios Mineras de Bolivia*. (CIMCA, UNESCO, 1989) pp. 14-15.

511 Alfonso Gumucio Dragon, ‘Miners’ radio stations: A unique communication experience from Bolivia’, in *Communication for Development and Social Change*, ed. by Jan Servaes (London: Sage, 2008), p. 320.

Radio and the Mines

Me decía que las troceras ahí eran grandes, que mucha curva para mojar en los rieles, que hartos trechos de subida por el suelo, y el calor oyes, me avisaba, asfixia mucho y hay poco aire. Yo por detrás, alumbrándole le espalda con mi lámpara enganchada al guaratojo, y fijándome en la roca dura que por todo lado nos rodeaba, le seguía los pasos pinchando mi coca, fumando mi kuyuna."

(René Poppe, Khoya Loco. *Cahiers du monde hispanique et luso-brésilien* No. 44, Numéro consacré à la Bolivie (1985), pp. 167-169

At the entrance, in a crudely diagrammed plastic poster one reads: "Radio Nacional de Huanuni Canal 2 minero 5965KHz 49mts Onda Corta".⁵¹² In the background, a picture of *Cerro Rico* and at the foreground, the photo of a video camera above the announcement of the "Channel 2 Miner" stands beside the drawing of a cartoon of a miner wearing a helmet, work clothes and holding a roll of paper in a papyrus style while talking at the microphone. The paint on the building announces, besides the name of the radio, the acronym SMTMH (Sindicato Mixto de Trabajadores Mineros de Huanuni – Mixed Union of Huanuni Miners Workers). On the inner walls, the constant presence of the mountains appears side by side with figures linked to Latin American political culture such as Che Guevara and a *Tío* with his demonic features.

With the motto of "*la voz sindicalista del minero boliviano*", Radio Nacional de Huanuni,⁵¹³ alongside *La voz de Minero* (Siglo XX, Potosí) and *Radio 21 de Diciembre* (Catavi) form the first and long-lasting experiences of radios "planned and conceived by the miners, (...) funded by the workers themselves, (...) managed and technically run by the miners who (...) created and produced [the programmes] locally".⁵¹⁴ The places where they were set up are three mining sites of the region of Potosí, Oruro and Sucre. Radio Nacional Huanuni, up to this day (2016), broadcasts in short waves and FM, besides having a TV channel. Its schedule consists of a variety of issues, from recordings of the Union meetings and local news to commentaries of football matches and international news, besides commercial advertisement throughout the schedule.⁵¹⁵

512 "National Huanuni Radio Channel 2 Miner 5965 Khz 49mts short-wave"

513 Available at: <<http://www.radionacionaldehuanuni.com/>> (live transmission)

514 Alfonso Gumucio Dragon, *Making Waves: Stories of Participatory Communication for Social Change* (New York: Report to the Rockefeller foundation, 2001) p. 35.

515 Including, in one of the listening, an advertisement announcing the services of "Albert Locastia, *macumbero, razadero, santero y astrólogo*" specialized in dark sciences, who makes *simpatias* for regaining the lost love, curing diseases through connection with dark forces, spiritual world and the devil.

The radio *21 de Diciembre* has its name in memory of the “Slaughter of Catavi”,⁵¹⁶ when in that day in the year of 1942, Bolivian military forces, responding to a claim made by the Patiño company,⁵¹⁷ attacked the mine workers killing hundreds of people.⁵¹⁸ *La voz del minero* was created basically to spread the “Thesis of Pulacayo”.⁵¹⁹ Directly connected with the federation of miners’ unions (FSTMB – Union Federation of Bolivian Mine Workers), the thesis were approved in November 1946 in the extraordinary congress of the mining working class.

Radio Vanguardia, also had a mural painted within the studios which pictured the history of the Colquiri mining centre, which is one of the aesthetic differential of alternative radios when compared to official or commercial ones. The occupation of its interior with motifs that engage with aesthetic, social, cultural and political references is a constant within the studios. To decorate the walls and murals with pictures, graffiti, quotes, stickers, paintings and posters is one of the aesthetic procedures which offer to independent radios an aspect of collective ownership and contrasts from both the clean and aseptic environment of the radio “classrooms” of Sutatenza and the professional studios of commercial radio.

In 1962, according to the Bolivian representative at the ITU, there were 94 operating radio stations in the country, 34 of which were clandestine.⁵²⁰ In a document from 1967, Giacomo Perolo issued a report on Short-Wave Bolivian radios from São Paulo (Brazil) as a contribution to DXRA⁵²¹ which he claims to be the most complete listing of Bolivian stations at the time. He was 32 years old and starts his report with a notable multidisciplinary approach which he attributes to

516 “The miners showed how the feudal-miner State raised the debt of the country with the sells of tin on ‘political prices’ in the midst of the world war, when this ore were so strategic to the allies”. Lupe Cajias, ‘Las Radios Mineras en el Sexenio’, in Alfonso Gumucio Dragon, *Las Radios Mineras de Bolivia*, *ibid.* p. 24.

517 “The Patiño company was able to use World War II anti-sabotage laws to get the government troops into the mines” Herbert Klein, ‘Prelude to the revolution’, in Maloy and Thorn (eds.), *Beyond the Revolution: Bolivia Since 1952* (Pittsburgh: University of Pittsburg Press, 1971) p. 37.

518 For a good account of the period and its political conflicts, see: James Dunkerley, *Rebellion in the veins: Political struggle in Bolivia 1952-82* (London: Verso, 1984).

519 As the radios were increasingly influenced by the unions, the approval of the thesis served to apply “Trotsky’s 1938 transitional program to Bolivian conditions with special reference to trade-union objective”. James Dunkerley, *Rebellion in the veins*, *ibid.* p. 17. See the thesis available in English here: <<https://nacla.org/article/thesis-pulacayo>>.

520 Giacomo Perolo, ‘A brief analysis of the Bolivian broadcasting situation of the period 1955–67 with special references to clandestine radio’ in *FRENDX* (Part I, Jun 1967), p. 5. Available at: <<http://www.pateplumaradio.com/>>

521 *DX Radio Association* is described as a “micro association, founded in 1957 by Don Jensen and Gerry Dexter” that gave birth to *Numero Uno*, a “première shortwave DX newsletter (...) published from October 1969 to June 2000.” The document used here is from 1967, so, two years before its launch. DXRA consisted in long distance radio communicators who wrote letters on a variety of issues related to radio communication: “The participants (...) consisted of five to seven active and serious DXers (...). Each member contributed a letter with his currents shortwave doings (...). When he received the packet of DXRA letters he removed his old entry, added a new one and got the package back on its way”. Jerome S. Berg, *Listening on the short waves: 1945 to today* (Jefferson: McFarland & Company Inc. Publishers, 2008) p. 215.

the passion for the technical aspects of amateur radio: “Interesting sidelines of SWL’ing hobby are increased geographical knowledge of far lands and their political situation.”⁵²²

Presenting his endeavour, he promptly states that “the upsurge of such widespread clandestine broadcasting is strictly a consequence of the political problems that are plaguing that country”.⁵²³ Aware of the situation of the workers from the mines and the type of exploitation they had been through, he writes that the underpaid six-days-a-week of ten to twelve hours with no benefits resembles the labour situation of nineteenth century USA workers and warns: “tin spells troubles”.

The dominance of the “tin empire” before the Bolivian revolution of 1952 is held responsible for both the strict private control of the mines and the political turmoil which ended up in the upsurge. Nonetheless, the revolution carried out by MNR (*Movimiento Nacionalista Revolucionario*) and its slogan “mines to the miners” did not improve the worker’s conditions and, in Perolo’s view, brought “featherbedders” to the mines, politically interfering in the nationalized mines but neither modernizing it nor increasing the worker’s wealth from their revenue. In order to keep the revolutionary regime against the rising tensions with the army, the government weaponized⁵²⁴ its supporters, including the miner’s movement and unions. In Perolo’s perspective, that action did not work for the miners because they had “little or no education, rather primitive feelings and [were] overwhelmingly attracted by alcohol”, finally remarking that “shooting literally became a part of daily life in most Bolivian mining centres”.⁵²⁵

By acknowledging the power gained by the miners, the government would have facilitated “the penetration of truly professional and trained communist agitators, rather than the part-time organizers of the past”.⁵²⁶ Communist ideology, which was indeed present in fractions of the leadership of the miner’s unions, as it was in Colombian rural areas, was conceived as evil and a danger to the poor. The reason, for Perolo, for why communism made an inroad in Latin America was “the ignorance of the people, together with its miserable living standards”.⁵²⁷

Responding to the question over the use of short wave radio by the miners, Perolo writes that, due to the power conquered by the miners, “SW broadcasting became a logical choice to transmit

522 Giacomo Perolo, ‘A brief analysis of the Bolivian broadcasting’. Ibid. p. 5

523 Giacomo Perolo, ‘A brief analysis of the Bolivian broadcasting’. Ibid. p. 5.

524 He writes that in a visit to the transmitters of radio Illimani he “had to pass several sentinels, all equipped with machine guns and automatic weapons” and that in Radio Altiplano, radio was protected by four towers, each of which with “.50 caliber machine guns”. See: Perolo. *ibid.* p. 7.

525 Giacomo Perolo, ‘A brief analysis of the Bolivian broadcasting’, *ibid.* p. 3.

526 Giacomo Perolo, ‘A brief analysis of the Bolivian broadcasting’, *ibid.* p. 4.

527 Giacomo Perolo, ‘A brief analysis of the Bolivian broadcasting’, *ibid.* p. 4.

the miners' feelings to the central Government as well as try to inflame the peasants of the neighbourhood".⁵²⁸

The existence of many "clandestine" stations seems to bother Perolo. He mentions the awkward situation of the Bolivian official ITU representative in showing 34 illegal stations located in well-known sites. He states that such stations did not abide to technical regulations, causing complaints from other countries and interfering in different radio bands. The language used by the workers also appeared to be a reason for diminishing the experience of the unlicensed popular radios: "most of those improvised broadcasters presented on the air, the same language they were probably using in the mines, without missing any popular obscenity".⁵²⁹ The increasing of transmission power from 50W or 100W to "1, 2 or even 5KW outlet" (which, when compared to Sutatenza is almost irrelevant), caused complaints of interference and attested for him the irresponsibility of the authorities: "the Government did not know what to do to bring the situation under control".⁵³⁰

In the last part of his report, Perolo notes the "uniqueness" of clandestine Radio in Bolivia for, "instead of being hidden in the jungle, hunted by government forces, it is peacefully (sic) installed in some convenient locations".⁵³¹ Apparently, the amateurism and the "odd looking appearance" of such "social-centre of the union-minded citizens of the area" also bothered Perolo. In a critical tone, he relates the "natural poverty of this area" with the technical "staggering home built units", the misadventures of bad voltage regulators and the half-wave dipole aerial "hanged between huge bamboos fastened to city lightpoles [with] a parasite (sic) grass that grows on light wires and on the feeders of the antennas".⁵³² The inner aesthetic of the reality of the radios seemed too dread to be functional and too amateur to abide to the common sense of radio operations.

Clandestine broadcast was never a peaceful activity, let alone when radio waves carry a political quality against constituted power of any kind. Although very useful for picturing the region's situation from a radio practitioner view, Perolo's report shows a formal comprehension of the radio phenomenon which is loaded with norms and concepts which cannot fit into the experience he intends to portray. Sensible to social questions, he underrates the amateurism, the political drive, the cultural manifestation and above all, the dialectics between an increasable rich environment (not a natural poor area, as he states) and the dramatic poverty of its population, who carry the heavy burden of colonial experience.

528 Giacomo Perolo, 'A brief analysis of the Bolivian broadcasting', *ibid.* p. 5.

529 Giacomo Perolo, 'A brief analysis of the Bolivian broadcasting'. *ibid.* p. 7.

530 Giacomo Perolo, 'A brief analysis of the Bolivian broadcasting'. *ibid.* p. 7.

531 Giacomo Perolo, 'A brief analysis of the Bolivian broadcasting', *ibid.* p. 9.

532 Giacomo Perolo, 'A brief analysis of the Bolivian broadcasting', *ibid.* p. 9.

When, in 1963, the MNR appointed Gal. René Barrientos as vice president and the strong unions empowered by the revolution opposed his mandate, a first wave of repression started at mining sites, and radios, as cores of their organizations, began to be attacked. Radio Huanuni was assaulted by an army unit in that year and, after Barrientos operated a coup against his own government in 1964, things worsened. In 1967 (when the government already knew about guerrilla activities and the presence of Che Guevara in Bolivia), in the mining site of Siglo XXI, where *La voz del minero* operated, the army killed 87 people, including women and children in what became known as “the massacre of San Juan”.⁵³³ Gal Barrientos declared the following:

First there were militant meetings at which the participants declared their support for the guerrillas and collected money for them. Then they threatened the constitutional government. Later the radio stations of Huanuni, Catavi and Siglo xx made broadcasts inciting the people to overthrow the government, start the class struggle and set up a proletarian government. Finally, the reds and corrupt old union leaders declared the three most important mines in the country to be territorio libre, where nobody could enter without their permission. Because of this the government instructed the armed forces to occupy the mines and restore order and authority.⁵³⁴

From 1968, the only radio with connections with the miners which continued to air was Radio Pio XII, a catholic station which moved from an anti-communist partner of COMIBOL (The miner industry corporation) to a defender of miners’ class and sole radiophonic oppositional voice. The massive shut down of oppositional vehicles, primarily represented by the miners’ radios remained under the regime of Gal Banzer, started in 1971. In 1974, the “government distributed 5,000 TV sets in mining communities trying to make the miners watch commercial TV instead of listening to the radio, but it never proved popular”.⁵³⁵ The period from 1971 to 1978 was one when the radios which survived the attacks were under heavy control by the government.

An important event involving the radios was one of the main causes for the débâcle of Banzer’s dictatorial regime. In December 1977, Luzmila de Pimentel, Nelly de Paniagua, Aurora de Lora and Angélica de Flores, four wives of miners from the districts of Catavi and Siglo XXI initiated a hunger strike to demand “the reopening of miners’ radio stations and amnesty for workers arrested for political reasons”.⁵³⁶ About the manoeuvre of Banzer to distribute televisions in order to diverse the attention of the workers, Chungara said:

533 See: James Dunkerley, *Rebellion in the veins*, ibid. p. 149.

534 Ruben Vasquez Diaz, *Bolivia a la hora del Che* (Mexico, 1968). Quoted from: Guillermo Lora, *A history of the Bolivian labour movement*. (Cambridge: Cambridge University Press, 1977) p. 346.

535 Don Moore, *Bolivia: Radio Under the Gun* (Monitoring Times, 1994.) Available at: <<http://www.pateplumaradio.com/south/bolivia/miners.html>>

536 Don Moore, *Bolivia: Radio Under the Gun*, ibid.

TV is run by the State. And the government says terrible things about us. (...) It says about the miners: they're crazy, they're lazy, they're reds' (...) and we do not have a TV station where we can answer back. We only had our radios. And, in order to silence that last voice, they wrecked them (astillas)'. Our radios, even though they use rough language – incivilized is what you call it – spoke of ourselves, of our problems, of our situation.⁵³⁷

One might argue if the radio boom of miner's workers was not a consequence of a progressive political change which took over the country in 1954. As a matter of fact, the agrarian reforms in the Andean region, not only did not increase the rural revenue due to the lack of subsidies and perennial technological and economic assistance but, moreover, imposed an alien agrarian regime different from "the communitarian productive experiences and the collective labour systems of indigenous traditions".⁵³⁸ The indigenous population, mostly agrarian, was conceptually and politically recreated as *campesinos* so as to fit with the ideal of a revolutionary nation which embraced nationalism and a state-driven economic development. Since the word *indios* referred to people "racially, socially and economically discriminated by the colonizer (...), the national revolution aims to erase the common use of this pejorative vocable (...) and irreversibly replace it for *campesino*".⁵³⁹ Nonetheless, traditional forms of communitarian organization persisted in the forms of *ayllus* and *mallkus*, which is stated by Gumucio-Dragon when commenting the language and cultural pertinence related to the radios:

Programming in Quechua and Aymara (...) was often aired. Peasants and miners would express themselves at the microphone in either of the two languages. Social sustainability benefited from this approach. (...) The amount of culture involved in the process was no doubt a result of the miners' own past as indigenous Aymara and Quechua population. The strength of the cultural baggage they brought into the mining districts fed into the labor movement key values and principles of solidarity, collective work, community decision-making, and communal justice, among other concepts that originated in the pre-Hispanic rural community (known as the Ayllu). These values prevented the miners from building typical trade unions that were only concerned with pay issues.⁵⁴⁰

Silvia Rivera Cusicanqui argues that Potosí's northern region represents a "bastion of ethnic resistance" against the narrow understanding of the individual and citizenship⁵⁴¹ by "liberal reformers, nationalist revolutionaries, or left parties, unions and NGOs". By exploring the nature of

537 Domitila Barrios de Chungara and Moema Viezzer, *Let Me Speak! Testimony of Domitila, a woman of the Bolivian mines* (New York: Monthly Review Press, 1978) p. 189.

538 Alfredo J. C. J. de Camargo, *Bolivia, a criação de um novo país* (Brasília: FUNAG, 2006) p. 152.

539 Alfredo Camargo, *Bolivia, a criação de um novo país*. *ibid.* p. 156.

540 Alfonso Gumucio-Dragon, 'Miner's Station Radios: A unique communication experience from Bolivia' in Allan O'connor, (ed.), *Community Radio in Bolivia: The Miners' Radio Stations* (Lampeter: Edwin Mellen Press, 2004) p. 321. (electronic version). Available from CLACSO Virtual Library at:
<<http://bibliotecavirtual.clacso.org.ar/ar/libros/edicion/media/26Chapter19.pdf>>

541 She differs the north Potosí region from the Altiplano, which is culturally and geographically correct. Nonetheless, here, for the particularity of the phenomenon studied, we arbitrarily use altiplano as a macro region where the radios flourished, at the risk of misusing the term and be accused of cultural inaccuracy, by attempting to illustrate a general issue concerning a phenomenon which existed beyond such divisions.

*Ayllus*⁵⁴² and their internal system of economic organization and structuration of the land, she reports the attacks they suffered from early projects of modernization in the nineteenth century up to the interference of trade unions and NGOs in the end of the 20th century. She claims that every attempt of modernization is in fact a colonial remnant which engaged in new political and cultural forms, personified by *criollos* and *mestizo* elite and the power arrangements which relegated traditional and ancestral practices to a primitive world which needed to be overcome.

However, although the influence of indigenous ethics and perspectives can be noticed, the radio movement was strongly aided and supported by the unions, representing a sort of political adaptation of heterogeneous forms belonging to precarious proletariat and rural indigenous practices. Thus, I do not claim that the radio movement was only possible due to traditional world views nor that it was solely raised from the mining industry worker's organization. Instead, I propose that this complex combination might appear as an innovative and strong framework to think of a practice engendered from a counter-colonial reason. Inserted in the same complex universe, the political quality of airwaves usage represent the condition of possibility of thinking a combination which adapts the perspective over the spectrum as a composition of the social reality.

The short description above has no intention to exhaust the complex and long history of miner's radio in Bolivia, which, besides many efforts, still lacks analysis from different perspectives and disciplines. What is proposed here is the use of radio as a construction which might help us to articulate and promote a sort of "counter-conquest" perspective which assembles a knowledge which trans-cross politics, philosophy and history in order to move beyond the regular assumption which explains and demands radio as a sort of activity "within" the system of rules and theories available to us by a dominant modern epistemology.

A plutonic allegory

In his recent book about the components from which an iPhone is assembled, Brian Merchant narrates his visit to the mines of *Cerro Rico* in Potosí and reports that, despite the current working force of fifteen thousand miners, including hundreds of children,⁵⁴³ he "didn't last half an hour down there".⁵⁴⁴ Calling attention to the terrifying "slipshod mine tunnel" and the "splintery wooden

542 See: Silvia Rivera Cusicanqui, 'Liberal Democracy and Ayllu Democracy in Bolivia: The Case of Northern Potosí' in *The Journal of development studies*. (vol. 26 n.4, 2007). pp. 97 – 121.

543 See: BBC Report: *Plight of Bolivia's child miners*, Available at: <<http://news.bbc.co.uk/2/hi/americas/7448032.stm>> & UNESCO, 'Young Bolivians on working in one of the world's most dangerous mines', Available at: <https://www.unicef.org/infobycountry/bolivia_58867.html>

544 Brian Merchant, *The one device: the secret history of iPhone* (New York: Hachette Book Group, 2017) p. 50.

beams that hold open the narrowing, pitch dark mine shaft”, he notes that “metal mined by man and children wielding the most primitive of tools in one of the world’s largest and oldest continuously running mine (...) winds up inside one of today’s most cutting-edge devices”.⁵⁴⁵

Mentioning Jack Weatherford’s words on Potosí’s importance as a “monument to capitalism and to the ensuing industrial revolution”, Merchant alerts the reader that the “mountain that eats men”, due to its long-lasting exploitation, might literally collapse, taking along its surroundings with it. Mine workers, who have an average life expectancy of 40, are paid “by the quantity of salable (sic) minerals they pry from Rico’s wall”. The tin said to be used in the iPhones are sold by two companies which are listed in Apple’s publicly available supply chain. Other materials identified inside iPhones, such as cobalt, tantalum and rare earth materials had been extracted from places such as the Democratic Republic of Congo, Mongolia and Indonesia. Worse than the fact that “many iPhone’s base elements are dug out in conditions that most iPhone users wouldn’t tolerate for even a few minutes”, is the unknown fact that, inside their devices, they carry a small amount of a living structure which bonds personhood, community and nature of a living cosmological reality.

CENSO POTOSINO	DE 1560
Indígenas	76.000
Espanhóis do reino e do império	40.000
Crioulos	35.000
Negros e mulatos	6.000
Espanhóis nascidos no Peru ⁹³	3.000
Total	160.000

Taken from: Cléber Cristiano Prodanov. Cultura e sociedade mineradora: Potosí, 1569-1670 (Anablume. São Paulo, 2002) p 67.

In 1570, Potosí had a population of around 120.000 people, which made it larger than Venice and Antwerp at that time. It was a pivotal centre of colonial accumulation through the wealth provided by its abundant silver mines. A significant part of that silver was carried down south by land and water until it reached the estuary of *Rio de la Plata* (Silver River) in Argentina (Land of *Argento* - silver), from where it left American lands by the Atlantic. In 1650, according to its census, Potosí was one of the biggest and richest cities in the world. Galeano writes that “Between 1503 and 1660, 185,000 kilograms of gold and 16,000,000 of silver arrived at the Spanish port of Sanlúcar de Barrameda, Silver shipped to Spain in little more than a century and a half exceeded three times the total European reserves”.⁵⁴⁶

⁵⁴⁵ Brian Merchant, *The one device*, ibid. p. 53.

Blaut identifies five elements which provided capital for the metropolis during the two first centuries of colonization:

One was gold and silver mining. A second was plantation agriculture, principally in Brazil. A third was the trade with Asia in spices, cloth, and much more. A fourth element was the profit returned to European houses from a variety of productive and commercial enterprises in the Americas, (...) A fifth was slaving.⁵⁴⁷

He also mentions that much of this wealth came not only from trade, but also from production itself which used forced labour. The central argument of Blaut is that this process was not only the “primitive accumulation” which gave Europe the possibility of developing capitalism from within. Instead, those relations which occurred during the exploitation of natural resources in the Americas were already a protocapitalist system which “gave [Europe] the power to immensely accelerate the transformation which was already underway - not only in Europe - toward capitalism as a political and social system, and to prevent non-European capitalists from sharing in the process”.⁵⁴⁸ Following Blaut’s idea that “major economic and social systems were built around the mines”, we should take into consideration the fact that this rising economy should also provide a beginning for the general mentality which formulated its cultural basis: modernity. If we cannot separate capitalism and modernity as two faces of a revolutionary social process, we must admit that the Western conception of mineral wealth and its knowledge about the cultural experiences around it should give fundamental importance to the American laboratory.

One of the first records of the mining colonial situation in the Andes and its consequences to local population is beautifully given by Guamán Poma de Ayala in his “The First New Chronicle and Good Government: On the History of the World and the Incas up to 1615”.⁵⁴⁹

Poma de Ayala inaugurates a new form of chronicle, which is a political and sociological treatise defending reform and proposing a series of “modern” demands to King Philip III of Spain, aiming a new and “good” way to govern the colony. The work is illustrated with 398 nib pen drawings made by the author, for he believed that the King would likely be persuaded by the images and that the visual language would replace a supposed lack of verbal style from his part. Frasier describes the manuscript as a “work of art as intention and appearance”,⁵⁵⁰ where Ayala recollects

546 Eduardo Galeano, *Open Veins of Latin America: Five Centuries of Pillage of a Continent*. (London: Latin American Bureau, 1997) p. 23.

547 J. M. Blaut, *1492 The debate on colonialism, eurocentrism, and history* (Trenton: Africa World Press, 1992). p. 38.

548 J. M. Blaut, *1492*, *ibid.* p. 41.

549 Felipe Guaman Poma de Ayala, *The First New Chronicle and Good Government: On the History of the World and the Incas up to 1615*, trans. by Roland Hamilton (Austin: University of Texas Press, 2009).

550 Valerie Frasier, ‘The Artistry of Guaman Poma’, in *RES: Anthropology and aesthetics* (The Pre-Columbian, n.29-30, Spring-Autumn 1996), pp. 269-289.

oral, visual, and self-witnessed experiences to elaborate a form of expression which is a mixture of sensible references, social analysis and political propositions expressed as an iconography of the experienced.⁵⁵¹ Thus, Ayala produces the first modern-colonial political treaty making use of a new exploration from conceptual aesthetics.

Ayala operates an early “bricolage” from Catholic, Spanish and Andean motifs providing an innovative language that presents “a unique and coherent native Andean account of the struggle to hang onto a disappearing Andean order and to reform, not overturn, the decadent foreign imperial regime that would replace it”.⁵⁵² But besides that, the chronicle shows an intention of informing and educating the crown,⁵⁵³ as would become a common practice in renaissance European elite circles involving lettered men and philosophers in relation to monarchs, showing a pioneering cosmopolitan figure dedicated to presenting a form of conceptual aesthetics fundamental to the rise of humanism, modernity, aesthetic expression and the study of the other. Ayala appears here as the first native to take the role of an enlightened philosopher and political advisor producing knowledge from the colonies. Amongst his early modern propositions for societal organization, he mentions the need for indigenous chiefs to learn Spanish and Latin (abiding by the empire and its rules), the impediment of non-indians to enter in indigenous villages, the necessity of trained professions to administer justice – removing Priests, *encomenderos* and trustees from such functions – and actions for social development such as constructions of schools (paid by the church) in every village and the prohibition for children from entering the mines.

A critic of the *mita* system of labour exploitation, Ayala expressed concerns about the *azogados*: miners who were contaminated by mercury in the mines. The regime of forced work in the mines is described as the cause of many deaths, escapes to urban centres, illness and cruelty: “Because of all these offences, they go missing from their villages so as to avoid the hell of the mines and suffering pains and torment from the devils. Others flee from the mines, others from the

551 As example, Valerie Frasier mentions the word IVSTICIA (Justice) drawn in calligraphic style which reminds “the form taken by metals rejas, grills, or iron work screens”, and also the word “Conquest”, where the three first letters were written “in the form of a grotesque scrollwork made up of devilish creatures”. Although Frasier sees the typo as an analogy for prison cells bars, we could also think as a reference to distorted forms of metals taken from the mines. See: Valerie Frasier, ‘The Artistry of Guaman Poma’, *ibid.* pp. 297-273.

552 Rolena Adorno, *Guaman Poma and His Illustrated Chronicle from Colonial Peru: From a Century of Scholarship to a New Era of Reading* (Copenhagen: Museum Tusulanum Press, University of Copenhagen and The Royal Library, 2001) p. 40.

553 “The absolutism of the regent, with his slavery code and manipulations, would dissolve itself in the scenery of the image in an hermeneutic of the symbolic”. Esperanza Lopéz-Parada, ‘El Noviciado del Infierno’. in *Carta: Principio Potosí*, *ibid.* p. 39.

roads, to avoid going to the mines and dying an early death”.⁵⁵⁴ Mining exploitation was a dead end from the beginning.

That creative “re-existence”⁵⁵⁵ initiated by Poma de Ayala is remembered by Walter Mignolo as an early representation of a decolonial “border thinking”. Seen also as the inauguration of a new genre raised by voices of personal experiences as necessity to operate the meanings and adapt the forms intended to translate to superior powers and by that, creates a new language

which semiotically weaves the contents of the Andean and European systems of cultural reference in the form of an original Andean text (...) derived from an oral chant in which the meaning depends on the ritual context in which its performance is fulfilled.⁵⁵⁶



Guamán Poma’s representation of Potosí, with the four Suyos (subdivisions of the Inca empire) sustaining the symbols of Imperial Spain.

A VILLA RICA ENPERE *Eal de Potocchi. Por la dicha mina es Castilla, Roma es Roma, el papa es papa y el rrey es monarca del mundo. Y la santa madre yglecia es defendida y nuestra santa fe guardada por los quatro rreys de las Yndias y por el enperador Ynga. Agora lo podera el papa de Roma y nuestro señor rrey don Phelipe el terzero.*
 / PLVS VLTTRA / EGO FVLCIO
 CVLLVNAS EIOS. [Yo fortifico sus columnas.] / Chinchay Suyo / Colla Suyo / minas de Potocí de plata / ciudad enperial, Castilla / CIVDAD

554 Axel M. Klohn and Philippe Chastonay, ‘Guaman Poma de Ayala’s ‘New Chronicle and Good Government’: A testimony on the health of the Indigenous populations in 16th century Peru’, in *Hygiea Internationalis: An interdisciplinary journal for the history of public health* (vol. 11, Issue1, 2015). p. 150.

555 Re-existence is defined by Achinte as “the redefining and re-signifying of life in conditions of dignity.” though everyday aesthetic practices. See: Adolfo Albán Achinte, ‘Interculturalidad sin decolonialidad? Colonialidades circulantes y prácticas de re-existencia”, in *Diversidad, interculturalidad y construcción de ciudad*, eds. Wilmer Villa and Arturo Grueso (Bogotá: Universidad Pedagógica Nacional/Alcaldía Mayor, 2008), pp. 85–86 & ‘Artistas indígenas y afrocolombianas: Entre las memorias y cosmovisiones estéticas de la resistencia’, in *Arte y estética en la encrucijada descolonial*, W. Mignolo y Z. Palermo eds., Ediciones del Signo, 2009.

556 “que hilvana (weaves) semióticamente los contenidos de los sistemas de referencia cultural implicados (andino y europeo) al modo de un texto original, andino (...), derivado de un canto oral cuyo sentido depende del contexto ritual en el que se lleva a cabo su performance” Roberto Viereck Salinas, *Nueva crónica y buen gobierno de Felipe Guaman Poma de Ayala (1615)* (Madrid: Biblioteca Virtual Cervantes, 2012) p. 8.

Fig 15: Guamam Poma's representation of Potosí with the four Suyos in Nueva corónica y buen gobierno (1615), drawing n.375, p. 1057. Available at the The Royal Danish Library Archive (<<http://www5.kb.dk/permalink/2006/poma/1065/es/text/>>)

In the above image (fig.15) taken from Ayala's treatise, one notices, in the centre of *Cerro rico*, the main silver reserve of the planet – above which the four kings of the *Suyos* and the one from Spain stand – a small path leading to a tiny space inside the mountain. This otherwise invisible interior of the mountain reveals and supports the outside where the rest of the conceptual and political landscape is constructed. The winding path leads to an underground location where one sees a suspended hole inside which lies a black material surrounded by the title “*minas de Potocí de plata*”, written below the figures of the authorities. Besides and beyond Ayala's practical modern discomfort, he also involuntarily expresses the mines “as a powerful allegorical machine, founder of a conflictive modernity [...] which expels an uncountable abundance”.⁵⁵⁷

Lopez-Parada defines Potosí as a “plutonic allegory, an ostentatious and baroque replacement of Hades' mouth”.⁵⁵⁸ Lezama Lima confers on the Latin American baroque this characteristic of “plutonism”, defining it as “an originary fire which breaks the fragments and unifies them”.⁵⁵⁹ As a movement originated from within the land that shapes the landscape (a geoculture), the analogy with the tensions and correlations between inside and outside appears as a formative conceptual element to understand this idea of Potosí as an allegory which is “the manifestation of an underworld which has no clear address or easy access”.⁵⁶⁰ Potosí would then foresee the misadventures of modernity before the revolutions which established a world-wide economic system, but would also, as a “spectacular and folded aesthetic, advance paradigms of many of our modern meta-representations”.⁵⁶¹ The baroque reference, pointing to the perennial occupation of spaces, the spiritual and material levels, the overwhelming presence of agencies and the existence of a connection between inside and outside, circumscribe Potosí as a conceptual and aesthetic symbol of a modernity to come and its economic system of expropriation. It is precisely this heritage which one can find in the mode of operation by which men and women of the mines, more than 300 years later, rendered to the defence of their spaces (individual, social and spiritual) through radio waves.

557 Esperanza López-Parada, 'El Noviciado del Infierno', *ibid.* p. 38.

558 Esperanza López-Parada, 'El Noviciado del Infierno', *ibid.* p. 39.

559 José Lezama Lima, *A expressão Americana*, *ibid.* p. 79.

560 Esperanza López-Parada. 'El Noviciado del Infierno', *ibid.* p. 39.

561 Esperanza López-Parada. 'El Noviciado del Infierno', *ibid.* p. 41.

In 1962, Miguel Alandia Pantoja⁵⁶² depicted the panorama of miner's radio in a mural called "radiodifusión" (fig.16).⁵⁶³ As an aesthetic manifestation of the social reality around the radios, it centrally features a microphone held by a hand of a faceless entity which embraces the figure of a lamenting miner worker. The figure of a *Tio*, the evil protector of the mines and a harlequin, symbolizing the popular carnival of Bolivia also stand in the foreground. In the background, the relief of the unequivocal mountains of the *Altiplano*.

Fig. 16: Miguel Alandia Pantoja, Radiodifusión. Mural at the Banco Central de Bolivia, La Paz, 1962. Museo Nacional de Arte.

Colonial Geo-aesthetics

**El Altiplano es resplandeciente como un acero
Su soledad de luna, tambor de las sublevaciones,
solfataras de leyendas. Pastoras de turbiones y
pesares, las vírgenes de la tierra alimentan la
hoguera de la música. Los hombres, en el metal de
sus cabellos, asilan el caliente perfume de los
combates. Altiplano rayado de caminos y de tristeza
como palma de minero.
(Oscar Cerruto – Altiplano)**

562 Muralist who took part in important moments of Bolivian political life such as the Chaco War, the revolution of 1954 and the commune of La Paz of 1971. Born in Catavi in 1914, his works represent that initial construction of Bolivian identity raised after the Chaco war and are marked by the movement of rebirth of indigenism. From the 13 murals he had realized, 4 were completely destroyed, 6 were restored and the others are missing. See: Everaldo de Oliveira Andrade, 'História, Arte, Política: o muralismo do boliviano Miguel Alandia Pantoja', in *História* (Franca: vol.25 n.2, 2006); Fernando Calderón, 'Memoria de un Olvido. El muralismo Boliviano', in *Nueva Sociedad* (n.116, Nov-Dec 1991) pp. 146-152, pp. 148.

563 The English doesn't have a word for 'radiodifusão' (radio diffusion), which is translated as 'broadcast', representing a different meaning to the sense of the process of emitting radio waves.

An interesting attempt to connect energies, digital media, and the “wireless” aspect of communication as a geo-physical aesthetics can be found in Jussi Parikka’s *A geology of media*. There, he argues that the “geophysical communication culture of technical media”⁵⁶⁴ forms a circuit which moves from the deep and lower geo-levels and extend into space through radio waves, in the form of a “geophysical aesthetics” bonding “natural”, material and technical elements as “bits” from which “media” are constituted. Claiming the intention to “radicalise” Zielinsky’s idea by taking media’s “deep times more literally and looking at geology of media in and through the mines and (un)grounds”,⁵⁶⁵ he proposes to look at

thousands, millions of years of “history” of rocks, minerals, geophysics, atmospheric durations, earth times, which are the focus of past decades of intensive epistemological inquiry and practical exploitation as resources — things we dig from the (under)ground, the harnessing of the atmosphere and the sky for signal transmissions, the outer space for satellites and even space junk, as a new extended geological “layer” that circles our planet.⁵⁶⁶

I take Parikka’s work as valuable exercise of focusing on the materiality of media through a novel approach which highlights the forgotten aspects of media constitution such as the economic logic of nature’s exploitation, the relation between technical media with environmental dramas and the aesthetic aspect formed by this geo-composition constructed from the links between nature and society. However, it is noticeable that, due to his “locus of enunciation”, one can identify the particular ring where he moves as a Western framework which ignores the centrality of the colonial experience as a fundamental contribution for the discussion he draws.

I have addressed the undeniable relations of the spectrum with geography, spatial coordinates and earthly interventions as well as their connection to the aesthetic matter and territorial power through the examples of Olmec lithic sculptures, concrete towers, Andean waka's and savages *picadas*. Those relations were able to be traced by a method we both share: decomposing what is seen as a whole into its lower, intensive and minor composites, fragments and bits. I intended to do that without reifying the spectrum and avoiding an ontological existence for it. Contrarily, my thesis seeks to demonstrate its existence as a socio-relational, dynamic, mutable, adaptable, open and powerful composition which is nurtured while it feeds its surrounding. In Parikka’s case, there is a tendency to treat the axiomatic idea of “media” as an irremediable given fact present in and by techno-modern times.

564 Jussi Parikka, *A geology of media* (London: University of Minnesota Press, 2015) p. 72.

565 Jussi Parikka, *A geology of media*, *ibid.* p. 27.

566 Jussi Parikka, *A geology of media*, *ibid.* p. 8.

When he temporally frames his analysis within modern capitalism⁵⁶⁷ (but only from the nineteenth century onwards), even though he admits that “media history participates in stories of global expansion through colonialism and the rush for resources”,⁵⁶⁸ he hardly explores the fact that the resources and knowledges extracted in colonial times and the consequence of their exploitation are central to explain, construct, formulate and justify the very conceptual frameworks used by his criticism: capitalism, subjectivity, geography, labour, aesthetics, nature, modernity, ecology, technology and science. Instead, most of his critical basis on the correlations between capitalism and the technologies of the senses are grounded in expressions from modern and post-modern Europe.⁵⁶⁹ If some locations and histories are doomed to be peripheral matters in this geophysical aesthetics while others fuel the knowledge produced over that very matter, we would not be allowed to say that there is no separation between the “levels” of media composites. If Africa, Asia and Latin America are central contributors to the capitalist wealth by geographically containing and providing natural resources (not to mention the aesthetic, anthropic and intellectual ones), one should not oversee the knowledge contribution of such geo-concrete “obscene” locations. When aiming to interpret the aesthetic language formed by the vocabulary of “geological formations, earthquakes, the soundscapes of ice melting, or (...) the various radiations that form the electromagnetic sphere”,⁵⁷⁰ one should not forget to include stridulous rivers, silent *selvas*, metal mountains, sounds of burning deserts and loadstone sculptures. Whereas the critical production used to explain the relation among media, geology, science and aesthetics comes from Western references, underdeveloped countries and former European colonies are mostly mentioned as exploited providers of natural resources for the production of the subjects he wishes to criticize.⁵⁷¹

When thinking of critical propositions and formulations on the natural material relation with expressive presentations which constitutes the electronic media, instead of moving into deeper, stranger and hidden realities – harder to recall and retrieve – and memory-less histories from an

567 “The explosive event of industrialization was dependent on new forms of energy; coal, oil, and gas became main drives replacing the reliance on wind, water, plants, trees, and animals as energy sources. After dirty aesthetics of coal that painted the surface and the sky black, through other fossil fuels we accessed the deep time of the earth (...). The scientific studies on deep time were paralleled with this practical tapping into the underground where mining engineers were discovering in the depths both coal and valuable metals such as gold, silver, and copper. Computers are a crystallization of past two hundred to three hundred years of scientific and technological development, geological insights, and geophysical affordances. They are dependent on precious metals, and even early-nineteenth-century networks needed copper for conducting the signal traffic of globalizing media culture”. Jussi Parikka, *A geology of media*, ibid. p. 137.

568 Jussi Parikka, *A geology of media*, ibid. p. 7.

569 “If the emergence of industrialization since the nineteenth century and the molding of the environment with mines, smelting facilities, and sulfur dioxide from coal energy was addressed by poets who either in adoring ways or critically narrativized the dramatic aesthetic and ecological change, our contemporary technological arts do similar work, although often also engaging directly with the material world of geophysics in their practice.” Jussi Parikka, *A geology of media*, ibid. p. 8.

570 Jussi Parikka, *A geology of media*, ibid. p. 68.

571 See: Jussi Parikka, *A geology of media*, ibid, Chapter 2: “An alternative deep time of the media”.

obtuse time tired of being obliterated, he turns into a situationist solution. From a “processual structuration” shared by the brain and the earth – named by Robert Smithson as “abstract geology” – he proposes the idea of psycogeophysics to think of a “radical aesthetics of the media technological world that maps the relations between subjectivity, capitalism, and the earth in long-term durations and geophysical assemblages”.⁵⁷² Another argumentative proposition comes from the critique of modernity through an environmentalist approach. Since he assumes that there is an obscene aspect of nature when taken as a “natural resource”, he coins the term *Anthrobscene* to reveal “the current Anthropocene of obscenities of the ecocrisis”.⁵⁷³ Such well-intentioned connection between capitalist geo-exploitation, modern technology and the environmental drama, however, assumes a patronizing aspect by holding the modern developed capitalism accountable for such condition while referring to the global south are mere providers of cheap labour and raw material: “The Anthrobscene logic: the North affords the Cool, the South provides the Cheap (labor)”. By doing so, he reproduces the perspective according to which “natural resources” are the few noticeable features from the peripheral world: a looted, wasted and savage land incapable to offer alternative criticism or alternative intellectual contribution to a question it helped to formulate.

When the contribution from the “underdeveloped” perspective is absent from the analytic range created to understand the underworld and its integrations with a high modern environment, it is not only the image of a mute and inexpressive provider of pure, natural, pre-pre-modern, lively and vivid raw material which is reproduced, but it is the very fairness of the argument of such integration itself that is at stake for its incompleteness. If one wants to criticize the “dirty aesthetics of coal that painted the surface and the sky black, through other fossil fuels”, one should equally hold accountable and important the exploration of the knowledge of its predecessors.⁵⁷⁴ Since “the reality of mines as essential to existence of contemporary technological culture”, the understanding of that very industrialization and its geo-aesthetics should consider Potosí, its “anecdotal history, its fantastic traditions and legends, its greatness and fabulous opulence”⁵⁷⁵ as an example of a forgotten fragment in the intellectual construction of a way out from media’s “obscene” constitution.

572 Jussi Parikka, *A geology of media*, *ibid.* p. 27.

573 Jussi Parikka, ‘Deep times and media mines: A descent into ecological materiality of technology’ in *General Ecology: The New Ecological Paradigm*, ed. by Erich Hörl and James Burton (London: Bloomsbury Academic, 2017). p. 177.

574 “The explosive event of industrialization was dependent on new forms of energy; coal, oil, and gas became main drives replacing the reliance on wind, water, plants, trees, and animals as energy sources”. Jussi Parikka, *A geology of media*, *ibid.* p. 137.

575 Title of a Book from Julio L Jaimes released in 1905 and available from the National Archive and Library of Bolivia: *La Villa Imperial de Potosi, Su Historia Anecdótica, Sus Tradiciones Y Leyendas Fantasticas, Su Grandeza Y Su Opulencia Fabulosas* (Forgotten Books: 2018).

Andean pre-hispanic society operation with metals from mines was composed by three phases: extraction, mineralogy and metallurgy.⁵⁷⁶ Deleuze and Guattari consider the work of smiths and artisans with metals a “war machine”, for it would silently infiltrate spiritual and material expressions into constructions and architectural assemblages. This process would configure the dissolution of hylomorfism (as a model imposed by the form into matter as external from it) and rise a machinic phylum: “the genesis of form (in geological, biological and cultural structures) as (...) immanent capabilities of the flows of matter-energy-information and not to any transcendent factor, whether platonic or divine”.⁵⁷⁷ As a commensurate space of metallurgy, the “holey space” of mining is “created by engaging directly with the subsoil”:

Cave-dwelling, earth-boring tunnellers are only imperfectly controlled by the State, and often have allied with nomads and with peasants in revolts against centralized authority. Thus, the machinic phylum explored in holey space connects with smooth space to form rhizomes, while it is conjugated (blocked) by State striation.⁵⁷⁸

As analogous as the affirmation above might appear in relation to the political role of the miner’s radio, the experience of a tragic yet sacred underworld formed by stones, metals and land taken by the violation of the mountain imprinted by colonial exploration (because of the connection between that nature’s iconography to communal and social spheres) drives a political commitment and resistance of a different kind: “they care for the mine. Their attitude is more than respect: It is reverential (...) it is also the sensibility of co-participation with the ways of the mine itself”.⁵⁷⁹

Final Remarks

If we would follow the Western tradition of spectral philosophy, one would reiterate that the radio communication is a heir of the cosmic mandate to interact with the material world. The consolidated philosophy which unfolded in the ideas of aether, radius and the spectrum has firmly affirmed the vector from the sky to the earth, in the case of the behaviour of such phenomenon. Here, instead of experimenting according to the Western paradigm of the aerial communication coming from above, we see a counter colonial perspective which uses instead a very plutonic and

576 See: Florian Téreygeol & Celia Castro, ‘La metalurgia prehispanica de la plata en Potosí. In Mina y metalurgia en los Andes del sur desde la epoca prehispanica hasta el siglo XVII’ (pp 11 – 28), in Pablo José Cruz & Jean Joinville Vacher (eds.), (Sucre: Instituto Francés de estudios andinos, Institut de recherche pour le developpement. 2008).

577 Manuel de Landa, ‘The machinic phylum’, in *Technomorphica* (Amsterdam: V2 Organization, 1997) p. 50. Available at: <<http://v2.nl/archive/articles/the-machinic-phylum>>.

578 Mark Bonta and John Protevi, *Deleuze and geophilosophy: a guide and glossary* (Edinburgh: Edinburgh University Press, 2004) p. 95.

579 Michael Taussig, *The devil and commodity fetishism*, *ibid.* p. 146.

underworld origin of the reality represented by the radio in social action. It is more chaotic, material, earthly and terrestrial than the abstract form of the energy emanated by the perfect symmetry of a divine cosmic force.

In the use of radio waves as a material and cosmological “flow that produces its own variable form”⁵⁸⁰ the spectrum participates in the destinies of the mountains and is also one of the keeper of its secrets. The radio waves, the radios themselves and their interrelation with the landscape and individuals design a “morphogenetic process which generates new structures without homogenizing the components and without submitting them to hierarchical control”.⁵⁸¹ However, a sense of the spectrum as a complete appearance of a sensible and material kind, extravagant, dread and extraordinary, although as correlative with “a life proper to matter, a vital state of matter as such, a material vitalism”, should link the landscape of the radios more to a political self-recognition represented by the waka's than to an “ordinarily hidden or covered, rendered unrecognizable”,⁵⁸² post-modern proposition of a machinic phylum.

Hidden, covered and unrecognisable are precisely the contribution coming from an experience which is only exotically considered by the Western rationality. It is rare to read about the use of radio spectrum by Bolivian miners as anticipated and illustrative contribution to the idea of Landa's “attractors”, for example: “forms of determinism which are local and multiple, instead of global and unique” which represent a “flow of energy moving in and out of the physical process (...) which governs the dynamical behaviour of a process, endogenously-generated stable states which allow certain structures to emerge spontaneously from relatively formless dynamics”.⁵⁸³ While De Landa gets close to observing the spectrum as such an “attractor” and radio stations as its “emerging structures”, he ends up limiting his example to “spontaneous rhythmical behaviour of components of radio transmitters” with no relation to real social practices and conditions. The limit of the theory appears to reveal the absence of practice. An option from the art of the “counter-conquest” should choose to reveal the practices from philosophical, practical and political constructions coming either from the pre-modern and pre-colonial expressions or from clashes and socio-cultural resistances which were, as this thesis proposes, already immanent, abundant, plutonic, communicative and anti-colonial geo-materialistic.

580 Brent Adkins, *A thousand Plateaus: A critical introduction and guide* (Edinburgh: Edinburgh University Press, 2015) p. 211.

581 Manuel de Landa. ‘Deleuze, Diagrams, and the Open- Ended Becoming’, in E. A. Grosz (ed.), *Becomings: Explorations in Time, Memory, and Futures* (Ithaca: Cornell University Press, 1999) p. 36.

582 Gilles Deleuze & Felix Guattari, *A thousand plateaus, Capitalism and Schizophrenia* (London: Continuum, 2004) p. 454.

583 Manuel de Landa, ‘The machinic phylum’, *ibid.* p. 51.

In the case of Bolivia, the radio spectrum, as the practical, savage, colonial and precarious metallurgical experience, embodies the former with aspects of the latter: a “materiality, natural or artificial, and both simultaneously; (...) matter in movement, in flux, in variation, matter as a conveyor of singularities and traits of expression”.⁵⁸⁴ But in such case, that realization of the theory is produced from the colonial universe of the mines and their resistance against that soul-destroying spirit. The “changes in the state of the matter” is a dramatical issue for the one who, due to a foreign command, violates the individual, communal and natural life (their self-established landscape) expressed by the mountains and “carries the gold, sweats and almost bends to the weight of the metal”.⁵⁸⁵

Being such cultural manifestations a form of understanding the sensible and the spiritual, the material forces and objects of nature which are tied to the role of the individual and the community by the occupation of a space and creation of a landscape, I understand the radio experience of the Bolivian miners as more than just a matter of “free speech”, technological appropriation or as a matter of democratization of communication. This thesis explores the ways by which the spectrum can be grasped as a demonstration of a resistance which is rooted in a qualitatively different world view and tradition,⁵⁸⁶ which qualifies such use and experience as anti-colonial.

Although the capitalist search for the underground overflowing wealth has not ceased, the denial of the colonial contribution linked to the end of an abstract romantic abundant past makes the Western mentality shift into a philosophy of scarcity and “ecocrisis”. In this sense, it is not the knowledge from the periphery which points out to a primitive, anachronic and historical reverse gear. Instead, it is the modern thought which, when obliterating the colonial past as residues for its intellectual constitution, produces a nostalgic thought of their own present, reproducing a history that is the very reason and explanation of their temporal isolation.

Lezama Lima distinguishes two modalities of the European baroque as “accumulation” and “asymmetry” as a heritage from a “degenerated gothic”.⁵⁸⁷ The American baroque, however, is marked instead by the forces of “tension” and “plutonism”. This distinctive mark on the baroque expression left by the phenomena of colonization forms a style which is born from an “originary fire which breaks the fragments and unifies them” in a reference to the underworld, the monadic and aesthetic constitution of the mantle. Such style, not only concrete, artistic and conceptual, is a

584 Gilles Deleuze & Felix Guattari, *A thousand plateaus*, ibid. p. 454.

585 Germán Arciniegas, *The Knight of El Dorado: The Tale of Don Gonzalo Jiménez de Quesada and His Conquest of New Granada, Now Called Colombia* (New York: The Viking Press, 1942) p. 161.

586 “Traditions consists here in the distinct ways on how transformation is given” Marshal Sahlins, ‘O “pessimismo sentimental” e a experiência etnográfica: por que a cultura não é um “objeto” em via de extinção’ (parte I), in *Mana* (Rio de Janeiro: vol.3, n.1, 1997) p. 62.

587 José Lezama Lima, *A expressão Americana*, ibid. p 79.

translation of a historical reality which, instead of framing the mind into a scarce and manageable environment, chooses to depart from the participation in an interfered landscape of “plutonic ostentatious”, “unaccountable abundance” and “fabulous opulence”.

Conclusion

A Wireless Critique

The relation between terrestrial space and “Hertzian space” (as the space of electromagnetic waves) should not be taken as a matter of distinctiveness. This thesis affirms that the terrestrial space – its physical manifestation and social reality – is not separated from the landscape created by the forms, functions, properties and qualities of the electromagnetic space. Therefore, I do not assume the division according to which “radiations of electronic objects extend into space [and] create an invisible tunable city – a Hertzian space”.⁵⁸⁸ To affirm that “a driver can read urban radio spaces revealing the hidden structures of everyday life and experience the overlap between the electromagnetic and urban environment” is to misinterpret the socio-historical construction of an integrated environment which, as I want to demonstrate, composes rather than juxtaposes such spaces. This dual vision, furthermore, leaves aside the conceptual history as well as the political function of what the EMS has become.

Moreover, such an idea of readability regarding different spaces assumes the electromagnetic constitution *a priori* and ultimately as a technically operational resource apart from everyday life. That is, it assumes the current imposed managerial and epistemic explanation of the spectrum as if it was only possible to examine its conditions and properties after it became functionally regulated as we understand it today. As a romantic approach towards the spectrum, such argument assumes the current status of urban and technological life as it concurrently does not indicate the potential transformation and action from outside the modern regulation of the Hertzian waves. Implicitly, this arguments confers legitimacy to the repression operated by private and public authorities against groups which experiment, live and imagine the radio waves alternatively. If there is a space proper to this element, all indeterminacy that emerges from social life would be able to live outside its sphere and be likely unconnected with it, which, according to this research, is not verifiable.

Even if we assume the Hertzian space as the territory occupied by radio waves from the early twentieth century onwards, we would have to take into account a broader aspect of its presence and interference in material and concrete constitutions. This can be represented by the towers which hold telecommunication antennas, mines from where metals used to the construction of wireless devices are taken, the social dynamic of radio studios and its surroundings and even classrooms in the countryside prepared to take lessons from wireless emissions. I argue that the occupation of the atmospheric air is directly connected to concrete and real social realities and spatial conflicts.

⁵⁸⁸ Dunne & Raby, ‘Hertzian Space’, in Andreas Broeckmann, *The art of the accident* (Amsterdam: NAI Publishers / V2 Organization, 1998) p. 119.

The relationships that illustrate the cases studied in this work refer more to the presence of an element interconnected with social reality than to a timeless, neutral, universal and eternal substance. This work noted that the current model of wireless communications management is supported by manners of thought developed by the colonizing nations and is intensified in the process of expanding the economic, aesthetic and political model that they reproduce. However, the technique and science embedded in this model are linked to a particular history that is an inheritance of the way of thinking that, together with ways of doing (economic, political and social) mark the separation between subject and object and operate a domination of senses and life experience within and around radio waves.

On the complexity regarding air relations, Tavares argues that, “In principle, by its own nature, air is an element that avoids spatial description, visual representation, and ultimately, historicity”, and continues, “Its resistance to formalization puts air almost on the opposite side of architecture: air is shapeless, neglects order, and is inclined to invisibility”.⁵⁸⁹ Nonetheless, when examined through its environment and landscapes, the radio spectrum occupation of the air becomes essentially political as a field of disputes for meaning. The control of the air is a colonial architecture of meaning:

likewise that of everyday spaces we inhabit [the air] calls the immersion of the body, and similarly, it is so integral to our habits that tends to precipitate in unconscious forms of perception. Parallels are not merely phenomenological but properly political. (...) the void becomes full of content and acquires the consistency of a space in itself. Integrated in the modes of seeing, conceiving, and governing the city, air becomes a matter of collective attention, visual elaboration, technological intervention and political action.⁵⁹⁰

The term wireless (travelled by waves, through the “air”), broadly used nowadays, is present in the technological development of communication since the last years of the nineteenth century, as a novelty replacing the wired telegraph. The word, however, means the absence of something (the wire) as it obliterates the element which is precisely the sensible negation of the void – the aether, the acoustic and electromagnetic waves, the light. Being the most significant interference in the air, the media constituted by the presence of the spectrum within it should represent, instead of a *wireless* media, a type of *spectrumwith*, *wavemore* or *withinair* communication. The focus on the absence of the materiality of the wire subsumes the presence of the political and aesthetic physicality of the air and all of which that is constituted of. Besides, the linear temporality of the Western thought, makes the historical determinism to replicate the wrong chronology by which the

589 Paulo Tavares, *General Essay on Air, Defined and Begun: Probes into Atmospheric Conditions of Liberal Democracy*. (London: Department of Visual Cultures, Goldsmiths, 2008) Available at <http://www.paulotavares.net/air/> Accessed on 18/04/2014

590 Paulo Tavares, *General Essay on Air, Defined and Begun*, *ibid.* Part3: Air.

wired refers to old and archaic past structures of communication while the wireless technology encompass the modern and contemporary form. As we have seen, communications without wire are much older and long-lasting than the ones provided by cables and wires.

The expression “on the air” became a synonym of the wireless operative function pertaining to such *spectrumwith* media. Air, thus, plays a metonymic role, appearing as a material-free, open wide, wire-less something but also as a communal all-embracing presence: “we are on the air”, “indigenous communities on the air”. John Durham Peters mentions time, chronology, astronomy, the heavens, astrology and calendars as examples of social control and political imprint of the “sky media”, furthermore noting the uses of celestial environment as forms of managing power: “flags and banners define territories, fireworks celebrate communities, and beacons, flares, spotlights, and skywriting send signals (...) Blimps, balloons, and satellites anchor much distance communication and probe the atmosphere”.⁵⁹¹ Nonetheless, he also distinguishes terrestrial media from celestial media, what in the case of waves in general and radio waves in particular, is, for me, a complicated division. Furthermore, he even values the different media, rendering them with levels of aesthetic aspects depending on the places they are affiliated to: “Compared to terrestrial media, celestial media – like aquatic media – are generally both more sublime and more abstract, in part because they can only rarely be touched by hand”.⁵⁹²

If the electromagnetic waves are withdrawn from this “profoundly heterogeneous” sky media which, “despite its reputation for openness and emptiness (...) has many layers of depth (...) to which it is always connected by climate and culture”,⁵⁹³ we might as well assume that the air as a composition plays a different – but yet fundamental – role than that of the “sky”. I propose the assumption of a *spectrumwith, wavemore or withinair* media formed by the spectrum *as* air which is – instead of celestial – a terrestrial infrastructure which constitutes and constructs the landscape through concreteness, history and politics.

The philosophical and epistemological outcomes of this perspective are important for the fact that it raises nature not as a Hegelian void that waits for history, but as a stubborn anti-Hegelian excessive historical nature in process of individuation, composition, expansion and mutation, claiming particularities and universalities alike. Through radio as a *spectrumwith* media, the semantic and political universe combines with air in the terrestrial becoming that is constantly

591 John Durham Peters, *The marvellous clouds: Towards a philosophy of elemental media*. (Chicago: The University of Chicago Press. 2015) p. 165.

592 John Durham Peters, *The marvellous clouds*, *ibid.* p. 167.

593 John Durham Peters, *The marvellous clouds*, *ibid.* p. 166.

changed and interruptible, participating on and interchanging with space and society, forming a vivid landscape.

Cuban poet José Lezama Lima defines landscape as a visible spirit which in its friendship and dialogue with men, reveals not only the delicacy, but also the refinement of nature. As a creator of culture, the Lezamian landscape is a nature “wonder anxious to express itself”⁵⁹⁴ which “moves in direction to a sense, an interpretation or a simple hermeneutics in order to subsequently seeks its reconstruction”.⁵⁹⁵ Contrary to Hegel’s historicism, Lezama’s baroque landscape is a full-of-motion creator, occupying a “gnostic space” of animistic force which moves natural as well as cultural entities, impeding them to “become *geléas* in their barren plain”.⁵⁹⁶

Seen as a landscape, this plenary composition of space refuses historicism (the linear evolution which takes us to the present and to a univocal future) for it is able to dictate its own destiny. As such, nature gains a spirit through language, combining a “more powerful and demonic magnetization”⁵⁹⁷ with the gnostic worship of senses which comprehends and conquest the amplitude of the sight. The conception of landscape that this thesis defends is the reconnection with the early style of the spectrum, a sort of neo-baroque perception in which the re-enchantment dialogues with the diabolic.

I argue that the air, before being a wireless space, contributes to the spectrum as “plain [plane] while composition” which constitutes a relief (as in contour) as it traces acquisitions of a counter-colonial “targeting point” and “optic field”. The idea of a landscape constitution from the air occupied by radio waves provides nature and spirit with an unavoidable end in expression where the sovereignty of the landscape finds “a verbal and earthly domain”⁵⁹⁸ and serves to understand and enjoy the radio spectrum as the presentation of a “voice that is rescuing the language of its own belonging”.⁵⁹⁹ Here, it is not the environment which is media, but the openness of possibilities of the landscape as composition of culture and expression. As Lezama Lima wrote about the Latin American expression, its counter colonial landscape presents a departure “from the pronunciation, not from the spelling; (...) from the air that in each land aspires and returns in its own way (...); and the idiom sounds again as classic in that assault of his words”.⁶⁰⁰ If the radio waves are seen as a

594 José Lezama Lima, *A expressão Americana*, *ibid.* p. 74.

595 José Lezama Lima, *A expressão Americana*, *ibid.* p. 47.

596 José Lezama Lima, *A expressão Americana*, *ibid.* p. 52.

597 José Lezama Lima, *A expressão Americana*, *Ibid.* p. 173.

598 “fundar um domínio verbal e terrenal”. José Lezama Lima, *A expressão Americana*, *Ibid.* p. 153.

599 “a voz que vai resgatando a linguagem de sua própria pertença”. José Lezama Lima, *A expressão Americana*, *Ibid.* p. 143.

600 “Partem da pronúncia e não da ortografia, (...) do ar que em cada terra aspira e devolve do seu modo (...); e o idioma soa outra vez como clássico, nessa tomada de assalto das suas palavras”. José Lezama Lima, *A expressão Americana*, *ibid.* p. 149.

part of this dialogue between nature and man, the control over it determines the expression of this landscape. The legal and political battles around the defense of radio as a territory (its manifestations and social configurations) that we observe in the Bolivian miner's radio stations and in the Brazilian free radios, show that it is precisely the presence of the spectrum as part of the landscape that moves the importance of communication as a sensuous expression.

The current hegemonic power employed for the control of the spectrum refers, among others, to the regulation of the separation between subject and object (spirit and nature) along with the management of the possibility for cultural creation. Dominating the meaning, pronunciation and production of waves, is to control the modes of its expansion as well as to determine the spatial reach which qualifies it. The ownership, perspectives and uses of such undulatory fragments of the electromagnetic landscape as arenas of disputes are understood by this thesis as fundamental axis for practices of counter-conquest struggles in media. The awareness that aesthetic sovereignty involves the domains of the landscape and that the landscape is formed by wave spaces makes us conclude that more than a "wireless" space, what is regulated, controlled and ordered is the very expressive language constituting itself as dimension and composition – an aesthetic expression.

Thus, we can conclude that the regulatory and organizational arguments that mark spectrum management - notably the definition of illegality of use, physical interference and resource scarcity, are used more to decrease access to the spectrum than to optimize it. Under a universal perspective and based on the need for human development and its need for expression. This is seen in the case of Radio Muda and the radio stations in Bolivia. Management is disconnected from social realities and therefore from the territory where its real use occurs. Furthermore, the force that operates against this territorial use, and that uses technical and legal arguments to operate, represses not only technical use, but, in its name, the expressions and manifestations of the landscape, which contain an aesthetic, a way of life and social struggles.

A Counter-Colonial Critique

Since José Lezama Lima identified the baroque expression of Latin America as an "art of the counter-conquest", I propose to differentiate what is addressed in this thesis from the already established "decolonial" perspective by illustrating the political resistance around radio movements as a "counter colonial communication".

The spectrum, analysed from the framework and cases investigated in this work, participates in time, space and society in the sensuous, conceptual, terrestrial-material as well as epistemic

activities of history. The radio spectrum is especially present in politics and in the socio-cultural properties of time and space which it helps to construct. I believe that it is a task of a decolonial theory to propose alternative perceptions, relations and knowledges about the electromagnetic spectrum which considers its colonial history, its stories and political practices. The proposition of this thesis is that such elaboration should be faced within an aesthetic framework in order to identify that coloniality is a main player when it comes to the restriction of expression through the wireless universe.

By the sensible, expressive and spiritual manifestations raised by electromagnetism or the fragments of which it is a composition, we have, up to now, been noticing the presence of an aesthetic experience and perception as an all-embracing aspect when it comes to social and political relations with perceptions, space, energies, time, colonialism and technology. By tracing aspects of the conceptual history along with the social use of the spectrum, we were able to notice particular instabilities and shifts across time and locations regarding the determinations of a knowledge framed by the senses.

I used radio waves particularly to illustrate the forms, properties and qualities of such fundamental structures for various forms of communication and highlighting how it interferes in cultural, scientific, economic and political realities. The preoccupation over the inequality, economic exploitation, monopolistic dominance and political power of wireless communication, therefore, should lead to new and unexamined connections if we are willing to propose a new political perspective towards technological communication tied to a marginal resistance.

The framework of coloniality and its power over knowledge, subjectivity and nature, appears as a historical condition fundamental to understand the disputes and interactions amongst many of the elements involved in the understanding of the aesthetic definition of the spectrum as fundamentally political. In order to explore this relationship between aesthetics and coloniality, I will refer to what I think is a missing perspective in the tradition of the “decolonial option”. In this sense, I allocate this thesis in a position within the field of the decolonial theory, but also dialoguing with media and cultural studies.

Through abiding by some postulates and recognizing a creative drive in the decolonial thought framework, I will particularly explore the gaps and contradictions of its aesthetic perspectives by mainly noticing the lack of connection between aesthetics and communication in such framework. Considering the centrality of the American history for the formation of modernity

and in the consolidation of coloniality, as affirmed by Walter Mignolo,⁶⁰¹ Aníbal Quijano⁶⁰² and Santiago Castro-Gómez,⁶⁰³ it is necessary to understand that modern aesthetics was also influenced by the American natural, social and spiritual universe. The novelty of the senses presented by the new world, however, had a particular element: the forms, languages and senses of communication. The importance of orality, spiritual instruction, the eagerness to name and the need to build new expressions are central elements to the social conflicts that have occurred on the continent since the conquest. Thus, the connection between aesthetics and communication takes, in America, a particular and central order in the understanding of colonial processes and in the exercise of the coloniality of power and knowledge. It is this relationship that is absent in much of the perspectives of colonial theory on aesthetics.

The modernity/coloniality research program (MCP), as described by Escobar,⁶⁰⁴ starts from the premise that there is no modernity without coloniality and that coloniality is constitutive of modernity, representing its “dark side”.⁶⁰⁵ Although surrounded by inner differences and approaches, its common axis stands around the idea that there is a modern-colonial regime of domination marked by a hierarchical positioning of locus of enunciation in the expressions of being, knowledge, power and subjectivity.

According to the tradition of progressive Latin American thought, the tendency’s main concern was to overlap new theoretical models with political urgencies, “as an intervention along the dividing line that produces subaltern and elite identities: that is, as a politics as well as a new kind of knowledge production”.⁶⁰⁶ If subalternity is a “relational rather than ontological identity”⁶⁰⁷ its concerns should care about those moments of encounter, communications and the consequences of the complicated forms of knowledge that ensue. In this sense, beyond the focus on literary criticism or communication as something rarefied, abstract as well as teleological, the attention to the resistance against knowledge domination in its mediatic universe, its historical formation in the

601 Walter Mignolo, *The idea of Latin America* (Oxford: Blackwell Publisher, 2005).

602 Aníbal Quijano & Immanuel Wallerstein, “Americanness as a concept, or the Americas in the modern world-system” in *International Social Science Journal* (v. 44, n. 4, 1992), p. 549–557.

603 Santiago Castro Gómez, ‘Ciências sociais, violência epistêmica e o problemada “invenção do outro”’, in Edgardo Lander (org.), *A colonialidade do saber: eurocentrismo e ciências sociais, perspectivas latino-americanas* (Buenos Aires: Clacso, 2005).

604 Arturo Escobar, ‘Words and knowledges otherwise’, in *Cultural Studies* (Taylor & Francis, vol.21, n.2&3 March/May 2007), pp. 179 – 210.

605 See: Walter D. Mignolo, *The Darker Side of Renaissance: Literacy, Territoriality and Colonization*. (Ann arbor: University of Michigan Press, 1995) & *The Darker Side of Western Modernity: Global Futures, Decolonial Options*. (Durham: Duke University Press, 2011).

606 John Beverly, ‘Writing in reverse: On the project of the Latin American Subaltern Studies Group’, in *The Latin American Cultural Studies Reader*, ed. by Ana Sarto, Alicia Rios, & Abril Trigo (Durham: Duke University Press, 2004) p. 628.

607 John Beverly, ‘Writing in reverse’, *ibid.* p. 626.

Americas and its weaving with nature, cosmology, technicality, aesthetics and politics should also be thought of in terms of a “writing in reverse”⁶⁰⁸ or a “knowledge otherwise”.⁶⁰⁹

This thesis, therefore, treats the creation, processes and consequences of an eventual “decolonial communication” in the sense of an encounter with the other together with oneself which is constitutive of a political and cultural landscape. A counter-colonial communication, in this sense, should appear as a sovereign construction as well as an aesthetic liberty to express and sense materiality, spirituality and technicality in ones’ own term based in constant intersubjective, material and meaningful existence. If, as we observe, media today has become a multi-faced tool for the control of social existence, it is worth remembering what Anibal Quijano points out to be the elements which constitute this colonial control: Labour/Material Production; Nature and Natural Resources; Gender and Sexuality; Collective authority (Law and State) and Knowledge/Subjectivity.⁶¹⁰ Therefore, a perception which identifies such elements in the form of a structural dominance of the status of communication should be of the interest of the intellectual endeavour towards the questioning of the power exerted by media in colonial social realities.

As many of the concepts worked by the MCP, aesthetics is not free from the reading which allocates it as “being an aspect of the colonial matrix of power, the imperial structure of control that began to be put in place in the sixteenth century with the emergence of the Atlantic commercial circuit and the colonization of the New World”.⁶¹¹ For the sake of differentiation from the “modern-colonial” project, Mignolo and Vázquez, in the presentation of a Social Text Online dossier from 2013, firstly designate two distinct concepts, that of the Aesthetic and that of Aisthesis:

Decolonial aestheSis starts from the consciousness that the modern/colonial project has implied not only control of the economy, the political, and knowledge, but also control over the senses and perception. Modern aestheTics have played a key role in configuring a canon, a normativity that enabled the disdain and the rejection of other forms of aesthetic practices, or, more precisely, other forms of aestheSis, of sensing and perceiving. Decolonial aestheSis is an option that delivers a radical critique to modern, postmodern, and altermodern aestheTics and, simultaneously, contributes to making visible decolonial subjectivities at the confluence of popular practices of re-existence, artistic installations, theatrical and musical performances, literature and poetry, sculpture and other visual arts.⁶¹²

608 Beverley, J. (2004b) ‘Writing in Reverse’, *ibid.*

609 Arturo Escobar. ‘Words and knowledges otherwise’, in *Cultural Studies*, *ibid.* pp. 179 – 210.

610 “Thus, in the control of labor and its resources and products, it is the capitalist enterprise; in the control of sex and its resources and products, the bourgeois family; in the control of authority and its resources and products, the nation-state; in the control of intersubjectivity, Eurocentrism. Third, each one of those institutions exists in a relation of interdependence with each one of the others. Therefore, the model of power is configured as a system.” Anibal Quijano, ‘Coloniality of power’, *ibid.* p. 545.

611 Walter Mignolo & Rolando Vázquez, ‘Decolonial Aisthesis: Colonial Wounds / Decolonial Healings’, in *Social Text Journal* (July 2013), Available at: http://socialtextjournal.org/periscope_article/decolonial-aesthetics-colonial-woundsdecolonial-healings/.

612 Rolando Vazquez poses an interesting point for this discussion when the group were debating over the choices of words: “The issue clearly highlights a necessary discussion on the advantages and disadvantages of using

This distinction between aisthesis and aesthetics intends to operate a criticism of modern reason embodied in eighteenth century philosophical formulations. However, since the early conception of aesthetics as a modern philosophical enterprise, not even its canons were able to fully agree, apprehend, describe or formulate it intelligibly and functionally enough, being this field a continuing battleground of formulations aiming to describe a confused universe born precisely after the novelty of a mercantile new world and the many material and sensuous encounters which it engendered. What is aesthetics if not the attempt to politically formulate an ordered regime to classify the confused epistemology of human senses' expression in its relations to nature, the other (human and natural), inventive production, material manipulation and inventive languages?

To accept this historical yet located definition of modern aesthetics as an autonomous production of colonial and Eurocentric epistemological domination is to deny the historical processes which posit the concept alongside many other domains related to modern development, all of which very much fed by the realities of the colonies. It would also be the negation of the capability of concepts to be adapted, modified, tensioned and subverted by time, space plus social relations. Aesthetics did not “became Eurocentered” at some point in history, but instead, it was the colonial experience in its many combined branches which was able to plunder, expropriate as well as profit from the experience acquired in a new world which they intended to reign over materially and spiritually. By doing so, the Western mind was able to fix the rules as well as to enact a particular significance which enables colonialism to learn how to combine the spatial and material domination with the primacy of qualifying and explaining the senses, expressions and cultural manifestations by judging.

We should think here in a few examples of the process of conceptual construction of aesthetics based on the American experience. Thomas More and William Shakespeare explored the new dimensions of the Atlantic world to create their fiction islands in *Utopia*⁶¹³ and *The Tempest*. More was inspired⁶¹⁴ by the new world discovery through the character of the Portuguese Raphael

Greek/Latin terms that have been so much used and abused by modern European colonialism (aesthetics, democracy, theory, politics, etc.). I would formulate the problem in the form of a question or challenge: What words outside Anglo-Saxon and Greco-Roman tradition can we use to talk about art, aesthetics, culture, and many other notions so crucial to our decolonial concerns and struggles? Is it time we begin to speak more openly and insistently of these things in their Quechua, Aymara, Arabic, and other formulations? What are these words and formulations in the first place, and how may we best teach them to each other in the many languages and systems of knowledge silenced by modern/colonial oppression?”. Walter Mignolo & Rolando Vázquez, ‘Decolonial Aisthesis’, *ibid.*

613 Utopia is “historically connected to the discovery and represents fundamental symbolic aspects of utopian dynamic of the conquest”. Beatriz Pastor Bodmer, *El jardín y el Peregrino: Ensayos sobre el pensamiento utópico Latinoamericano, 1492 – 1695* (Amsterdam: Rodopi, 1996) p. 4.

614 Besides material goods, the navigators who came back from America brought back stories and legends to Europe. Much of this cargo was unloaded in the port of Antwerp, a prosperous city which had its golden age in the sixteenth century. Antwerp was also a great publishing centre, what would make the city a cultural axis at the time. Books

Hythloday,⁶¹⁵ a traveller who used to sail with Americo Vaspucci, Italian navigator which rendered his name to the new continent due to the 1507 *Universalis Cosmographia* map by Martin Waldseemuller. In 1536, Gonzalo Jimenez de Quesada⁶¹⁶ was chosen to travel to the New World in order to find the mythical city of El Dorado. In the final lines of the opening of Miguel de Cervante's book one reads: "They will have it his surname was Quixada or Quesada (for here there is some difference of opinion among the authors who write on the subject)".⁶¹⁷ By 1605, the book was taken to America and, by 1607, "long before the second part appeared, a masked knight of the Rueful Countenance frolicked in the carnivals of Lima".⁶¹⁸ German Arciniegas considers that there is an "anticipation of Don Quixote" in Thomas Morus's utopia by identifying in both creations "a cervantine illusion of a marvellous island in which ideal terms there must be founded the good government".⁶¹⁹

Aesthetics, much more than *aesthesis*, carries necessarily the weight of the new world. It was born and initiated from the opening up of optics made possible by the colonial – enlightenment regime. Thus, if America is to be considered a fundamental axis for understanding colonial power, and, if crossing through its history passes the production of economic modernity (Capitalism), human modernity (slavery and ontology), political modernity (liberalism and socialism), ecological modernity (natural resources and Anthropocene) and material modernity (arts and architecture), why then, the aspect of the expressive and symbolic modernity – aesthetics – should be neglected at the expense of a term completely alien to it?

If decolonial aisthesis "challenges the self-proclaimed imperial right to name and create (constructed and artificial) identities by means either of silencing or trivialization",⁶²⁰ one should seek for the birth of modern aesthetics along with the resistance to its regulatory imposition in the struggle for the vivid expression of life and worldviews which began at the very moment of the encounter which fundamentally generated a new and modern world constructed on the basis of

and reports along with silver and sugar became available for the European market and imagination. It was in Antwerp, through Peter Gilles and Erasmus of Rotterdam that More got in touch with the narratives of the discovery: "But what furnished More, not with the notion, but with the actual framework of the Utopia was (...) an appendix to a little book entitled *Cosmographiae Introductio* to which was appended a Latin translation of Amerigo Vespucci's four voyages as described by himself - *Quatuor Americi Vesputii Navigationes*". J. Churton Collins, *Introduction to Thomas More: 'Sir Thomas More's Utopia'* (Oxford: Clarendon Press, 1904). p. xxxviii.

615 Here again the junction of fiction and fact, story and reality is presented by the composition of the character's name, which is a combination of two Greek words, *hytlos*, meaning trifles or nonsense, and *daiein* (distribute) or *daios* (skilled), being translated as "good to tell stories", "knowing in trifles" and "good in iddle talk".

616 See: Germán Arciniegas, *The Knight of El Dorado: The Tale of Don Gonzalo Jiménez de Quesada and His Conquest of New Granada, Now Called Colombia*, (New York: The Viking Press, 1942)

617 Miguel de Cervantes Saavedra, *Don Quixote, Volume I*, trans. by John Ormsby (Morrisville: Pergonomas, 2006), p. 35.

618 German Arciniegas, *Latin America: A Cultural History* (London: The Cresset Press, 1969) p. 87.

619 German Arciniegas, *America en Europa*, *ibid.* p. 50.

620 Alana Lockward, Rolando Vázquez and others, 'Decolonial Aesthetics'. *ibid.*

previously unseen labour, economic, social, communicational and cultural experiences and exploitation.

This work's hypothesis is that the aim of an *aesthetics at large* (an anti-colonial expression) is not to liberate aisthesis from aesthetics,⁶²¹ but to liberate aesthetics from a particular notion of the "arts". I would rather perceive the common act and the everyday resistances as an artistic project and as a grammar of rupture. The "art" (as it appears in de Certeau) appears where the artist is no longer present or identified and where the practice is liberated from the institutionalized persona as well as from its surrounding artificial infrastructure. On the debate about aesthetics x aisthesis, this thesis understands that, instead of a replacement act, it would be politically relevant in addition to being culturally fruitful, than to rather take back aesthetics, moving it away and beyond the strict notion delivered by the modern conception of it.

In this sense, this thesis concurs with the notion of aesthetics that, as developed by Alejandro Vallega, aims for a "sense of reality that emerges from closely considering Latin American thought and experience (...) which presents a great challenge and fecund possibilities for aesthetics in general, as well as for philosophies of liberation and decolonial projects in particular".⁶²²

Vallega conceives the question of Latin American aesthetics from the ideas of liberation and temporality. Assuming the fact that the lively experience and consciousness aroused by the sub-continent expression is not restricted to a single race or ethnicity, he highlights "the dense overlapping of cultures, lineages, histories and ways of being and (...) the unique existence that occur in Latin America" to propose that, in order to find this liberation, Latin America must find "a language for its distinctness and its plural events (...), the articulation of the American experience from the Americas and on its own terms".⁶²³ In privileging imagination, Vallega values "a magical intuitive sense and (...) the engagement of a rhythm, a temporality in which one may think and write (...) [what] orient[s] the very interpretation of reality".⁶²⁴

Thinking of temporality signifies a process which seeks to overcome the linear time of Western European consciousness, given the fact that economic conditions "assumed by capitalist

621 "Aesthetics become Eurocentered in eighteenth-century Europe when (...) Kant mutated it into a key concept to regulate sensing the beautiful and the sublime. This was the starting point of "modern aesthetics" that emerged from European experience and local history (...). In this way, aesthetics colonized aesthetics in two directions: in time, it established the standards in and from the European present. And, in space, it was projected to the entire population of the planet. Aesthetics and reason became two new concepts incorporated in the colonial matrix or power. Today, decolonial aesthetics is a confrontation with modern aesthetics, and its aftermath (postmodern and altermodern aesthetics) to decolonize the regulation of sensing all the sensations to which our bodies respond, from culture as well as from nature." Walter Mignolo & Rolando Vázquez, 'Decolonial Aisthesis', *Ibid*.

622 Alejandro A. Vallega, 'Exordio / Exordium: For an aesthetics of liberation out of Latin American Experience', in *Symposium* (vol.18, issue1, Spring 2014), pp. 125-140, p. 140.

623 Alejandro A. Vallega, 'Exordio', *ibid*. p. 129.

624 Alejandro A. Vallega, 'Exordio', *ibid*. p. 131.

and Marxist analysis to be a matter of the past are elements that continue to operate (...) and constitute central elements of Latin American reality”.⁶²⁵ The same being true for modes of thought and knowledges, which, by the centrality of the Western notion of time – the present belongs to the end of its evolutionary line – impedes the openness of inputs given by the ancestral, traditional, mythological as well as magical perceptions of the world: “the very recognition of forms of knowledge, as well as the projection of ways of knowing, remains under the requirement of the movement or progress of the single timeline”.⁶²⁶ Such a philosophical temporal construction is credited to Hegel’s modern thoughts on history and nature. Since the historical determination of humankind and its destiny is to progress equally as one, and there are different levels of development in the same chronological time,

the postulate of homogeneity requires that, in practical terms, differences among human societies be explained as differences of temporality: an early nineteenth-century German Protestant industrialist and his contemporary Indian Hindu peasant farmer may well occupy the same chronological frame, but they represent different levels of accomplishment in the development of the spirit.⁶²⁷

The decolonial perspective over aesthetic claims for alternative practical epistemologies by inserting a political critique concerning the regular and dominant institutions of arts and celebrates languages which move away from the more individualistic and self-referential forms of expression, arguing for an artistic shift from a representation phenomenon to a relational one. Instead of being a “narcisistic exercise which leads us to produce objects to the self-satisfaction in the art field and all its contingencies”⁶²⁸, art would serve as a “permanent act of reflection (...) to widen the sceneries of discussion around the social exclusion, the racialization, the genocide violence, the reaffirmation of stereotypes and authoritarianism”.⁶²⁹ The idea of a decolonial approach to arts and expression, thus, appears to aim the exercise of a repressed knowledge, comprising alternative worldviews, social liberation, cultural emancipation and aesthetic autonomy. It also advocates for forms of putting oneself into the world, since one’s expressions and sentiments had been denied by the hegemonic form of acquiring and externalizing sensuousness. Therefore, to dwell in the world, it would be

625 Alejandro A. Vallega, ‘Exordio’, *ibid.* p. 137.

626 Alejandro A. Vallega, ‘Exordio’, *ibid.* p. 136.

627 Wlad Godzich and Nicholas Spadaccini, ‘Foreword: The changing face of history’, quoted in José Antonio Maravall, *Culture of the Baroque: Analysis of a historical structure* (Mineapolis: University of Minnesota Press, 1986) p. x.

628 “ejercicio narcisista que nos lleva a producir objetos para la autosatisfacción del campo del arte y todas las contingencias que lo acompañan.” Adolfo Albán Achinte, ‘Pedagogías de la re-existencia’, *ibid.* p. 453.

629 “El arte como acto de reflexión permanente —y no solamente como el hecho de realizar objetos artísticos— debe contribuir a ensanchar los escenarios de discusión en torno a la exclusión social, la racialización, la violencia genocida, la reaffirmación de los estereotipos y el autoritarismo.” Adolfo Albán Achinte, ‘Pedagogías de la re-existencia’, *ibid.* p. 453.

necessary to experience, construct and relate to it – through language and dialogue – in the path towards a construction of a “relational time which we actualize when speaking”⁶³⁰

If decolonial aisthesis, abiding to the general postulate of decoloniality by which the “practices” would have to produce “a critical perspective of hegemonic knowledge in the power relations”⁶³¹, wishes to subvert the “dualism between mind and body and between mind and nature” that marks “the foundation of knowledge in European modern times”⁶³², the movement for conceptual creation should point out to interferences in the practices by questioning the language and institutions used to explain and regulate the deeper infrastructures of such expressions. Santiago Castro Gomez calls “point zero”⁶³³ enlighten scientific language that epistemologically distances itself from the everyday language and avoids the “indetermination that characterizes all other languages”. Acquiring an autonomous and sovereign language to describe and present sensations and expression is part of moving away from this point and getting rid of the colonial imposed “point of view that hides and conceals itself as being beyond a particular point of view”.

If the decolonial theory aims to break “references of epistemic legitimacy”,⁶³⁴ by means of “expressions of the availability of the subject to engage in the dialogue and the desire for exchange”⁶³⁵ in relation to layers subjugated by the colonial power, the notable absence of engaging in alternative optics towards communication, technology and media appears as either a miscomprehension of the importance of such phenomenon or the resistance to touch this issue for the risk of reaching beyond the comfortable field created to sediment one’s own proposed premises.

Instead of observing and fostering the aesthetic element in cultural practices, experiences, political struggles and everyday life of subaltern, marginalized, dominated population, such practices seem to be willing to represent them in the form of artistic projects.⁶³⁶ Thus, it reinforces the notion of representation and mediation as well as the separation amongst the parts which

630 Rolando Vazquez & Miriam Barrera Contreras, ‘Aisthesis decolonial’, *ibid.* p. 82.

631 Ramon Grosfoguel, ‘The Epistemic Decolonial Turn Beyond Political-Economic Paradigms’, in *Cultural Studies* (Routledge, vol.21, n.1&2, Mar-May 2007), p. 213.

632 Ramon Grosfoguel, ‘The Epistemic Decolonial Turn’, *ibid.* p. 214.

633 Santiago Castro-Gomez, *La Hybris del Punto Cero: Ciencia, Raza e Ilustracion en la Nueva Granada (1750 – 1816)*, (Bogotá: Editorial Pontificia Universidad Javeriana, 2005).

634 Walter Mignolo, ‘Geopolitics of Sensing and Knowing: On (De)Coloniality, Border Thinking, and Epistemic Disobedience’, In. *Postcolonial Studies* (Vol14, Issue 3: Latin America and the Politics of Knowledge, 2011) p131.

635 Nelson Maldonado-Torres, ‘On the Coloniality of Being’, *Ibid.* p261.

636 Some artistic projects identified with the MCP can be seen here: ‘Arte Y Decolonialidad’, in *Calle 14: Revista de Investigación En El Campo Del Arte* (vol.5, n.6, 2012) Available at: <<http://www.libreriadelau.com/arte-y-decolonialidad-calle-14-revista-de-investigacion-en-el-campo-del-arte-no-06-vol-5-artes-visuales-1.html#U3YI6Ib7vac>>; ‘Decolonial AestheSis at the 11th Havana Biennial’, Available at: <http://socialtextjournal.org/periscope_article/decolonial-aesthesis-at-the-11th-havana-biennial/>; ‘Aisthesis Decolonial’, in. *Calle 14*, *ibid.* (vol.4, n.4, 2010); Pedro Lasch, ‘Breve argumento visual por una estética descolonial’, in *Lecturas para un espectador inquieto* (Madrid: CA2M, 2012), pp. 273-282; Nasheli Jimenes Del Val, ‘La modernidad/colonialidad y los estudios visuales’, *Global Art Archive Project* (Barcelona: 2013)

constitute the aesthetic construction. Claiming to be a movement or a circuit, this decolonial option for the aesthetics implicitly affirms the ownership of an artistic, curatorial, performatic, avant-garde and exhibitionist role as of pertaining to a “decolonial” expression as it announces its spaces as being outside the colonial regime of the arts. Decolonial aesthetics end up equally evaluating “works of art” from a Western perspective, reproducing the logic of value of videos, installations, performances, encounters, exhibitions, etc, as a mode to secure themselves mirroring a more powerful constitution which drives the economic, epistemic and political force which had settled the very regime they try to overcome.

In this way, what this investigation showed us, was that the idea of “decolonial aisthesis” does not encompass a series of counter-colonial manners of expression addressed in this work. We verified that the connection between aesthetics and social struggle in Latin America is linked to the conquest in the form of the imposition of colonial relations and reasons and the conflicts that occur around communication processes, operating a social and instrumental technology that amplifies and reverberates the hierarchy characterized by the mercantile and colonial period. Thus, we conclude that an analysis of a “decolonial aesthetics” cannot disregard the forms, materiality and social relations involved in processes of communication. In addition, one should not see aesthetics solely from the point of view of the arts, as it manifests itself in galleries and cultural markets. The orality, the establishment of a colonial society, the implementation of global modernity from the twentieth century onward and the forms of repression that popular radio projects reproduce makes observe the aesthetic phenomenon from a marginal perspective that insert in the critical equation the political and economic structure of media monopolies and their connections with (state and spiritual) power and with the capitalist market. Therefore, wireless technology appears as a central element to understand the political relations between cultural manifestations, artistic creations, territories and social struggles that took place in the sub-continent.

A Critique of Critical Media

A synthesis of the connection between landscape, counter colonial politics and communication can be illustrated by experiences of political radios in Latin America. They not only picture a specific way when using and managing the possibilities of the radio spectrum but also present to media criticism the possibilities of other approaches when analysing the importance of communication in movements of resistance. Here, I explore examples that go beyond the

framework of audiences, technological innovation, artistic uses and radio critique as addressed by the Western analysis of media. What the studied cases have informed us is that new optics over such relations between politics and communication – seen from different types of connections – are essential for the creation of structures of thought that allows us to deliver new forms of knowledge production in the radio field.

The importance of Radio in political struggle, specially in colonized areas is widely recognized. Even so, not much has been done to understand these phenomena as a pivotal element of alternative knowledge for decolonizing actions or to propose a broader perspective on how they relate to many spheres of social reality. Radio has been treated as an “instrument” for political struggle, a “tool” for mobilization and action, a “trigger” for education and citizenship or a “media” for the community. The interest in radio had not achieved levels of political philosophy embedded in “decolonial” thought nor presented alternative knowledges and penetrations over its impacts in social-cultural environments, leaving Latin America’s perspective on radio inside colonial optics.

In the political turmoil of the seventies and eighties in Latin America, many of the revolutionary movements used radio as a medium to engage, propagate and support their political actions. In 1958, a group of rebels founded “Radio Rebelde”⁶³⁷ in the mountains of Cuba to offer “vivid news of combats, encounters of all kind, of murders committed by the repression and furthermore, doctrinal orientations, practical teachings to the civil population”.⁶³⁸ Before the set up of the radio, a word of mouth form of communication network was named “Radio Bemba”, which, as explained by Pasqualino, was “a communication dynamics amongst the peasants (...) [in] the region where Sierra Maestra is located”.⁶³⁹ Radio Rebelde had the subtitle of “the voice of Sierra Maestra”, the iconic mountain range in the south-east of the island where the revolutionary movement 26th of July initiated its operations in 1958. The idea of the mountain having a voice emphasize the disembodiment of sound as part of a vivid sensation of interaction between meaning and nature, messages and landscapes: “the inscription of the voice in the re-entrance of things, which open themselves to the speeches in uproar, with and despite the writing”.⁶⁴⁰ Radio Rebelde was directly connected to the history and imaginary of Sierra Maestra, just as the topological structure is inevitably symbolically linked with the revolution itself:

637 For the history of Radio Rebelde and its role in the Cuban revolution, see: Beatriz Buschel Pasqualino, *A rádio rebelde como arma de guerrilha na revolução cubana*, (Campinas: UNICAMP, IFHC, Masters dissertation, 2016).

638 “noticias vivas, de combates, encuentros de todo tipo, asesinatos cometidos por la represión y, además, orientaciones doctrinales, enseñanzas prácticas a la población civil”. Ernesto Guevara, *A guerra de guerrillas* (La Habana: Editorial de Ciências Sociais, 1985) p. 137.

639 Beatriz Buschel Pasqualino, ‘Os 311 dias da Rádio Rebelde como arma guerrilheira em Cuba’, in *Revista Alterjor* (São Paulo: ECA/USP, vol2, Ed8, Year4, Jul-Dec, 2013) p. 13.

640 Amálio Pinheiro, ‘O jornal na Paisagem’, in Karla Brunet & Raquel Renno (Orgs.) *Tropixel: Arte, ciência, tecnologia e sociedade* (Salvador: EDUFBA, 2015) p. 91.

The landscape not only presents us the world as such, but also a construction of this world, a form of seeing it. The landscape is a social and cultural construction, always tied to a physical and material substrata. The landscape is a geographical tangible and its intangible interpretation, the sign and the signifier, the container and the content, reality and fiction.⁶⁴¹

In every aspect, those alternative experiences of radio have a different spirit from the cold, formal and aseptic milieu which surrounds commercial radio and big broadcasters. This thesis argues that at a great stance, this relates to an aesthetic engagement which combines political will, amateur efforts, and a spirit of passion and strong connection to technical objects and spatial locations. This “aesthetics at large”, are constructed by the inner property of the electromagnetic spectrum of expanding/reverberating/extending messages and feelings in an incorporeal form at the same time that it reveals unbreakable bonds with the landscape, the technical apparatus and the social collective which dedicates energy to the maintenance of the radio.

In this sense, the technical object of radio takes the role of a “organic complementation to the individual”⁶⁴² which takes concretion from the use and the space in which it is inserted. If we assume, alongside Rodolfo Kusch, that the central role of “culture” “supposes a soil where one necessarily dwells”, and that it needs to find a place, a location and an ecology in which it could form its “strategy” to *habitate*, one should deduce that “If culture is a strategy to live in a place at a time, therefore it is also politics”.⁶⁴³ In his philosophical search for what is the American subject, he insists in the search for the existence as a cultural task which comprises a fixation and a gesture. From there he develops the notion of *to be being (estar siendo)*, which comprises a definition (*ser*) and a signalling (*estar*) forming an aesthetic geography which cares simultaneously for the location and the inner production of the subjective self.

One of the best syntheses of the practical relation between technical, political, expressive and natural elements involved in a counter colonial radio project can be found in the initial page of López Vigil's book on Radio Venceremos, from El Salvador:

[In] El Salvador at that time, at the end of the seventies, things had turned black as ants. The repression was brutal. Print media was no longer effective. If you had a leaflet in your bag, it could coast your life. (...) Maybe that's why the idea of a radio took root – they can't frisk you for a voice. (...) we found Toño, an electrical engineer, a dreamer, one of those people who never make money because he spends his life looking for meaning in what he does. Toño worked in a cockroach-

641 “The landscape not only presents us the world as such, but also a construction of this world, a form of seeing it. The landscape is a social and cultural construction, always tied to a physical and material substrata. The landscape is a geographical tangible and its intangible interpretation, the sign and the signifier, the container and the content, reality and fiction”. Joan Nogue, ‘Paisaje y comunicacion: el resurgir de las geografias emocionales’, in *Teoría y paisaje: reflexiones desde miradas interdisciplinarias* (Barcelona: Observatorio del Paisaje de Cataluña, universitat pompeo fabra, pp25 – 41) p. 27.

642 Rodolfo Kusch, *Geocultura del hombre Americano*. (Buenos Aires: Fernando Garcia Cambeiro, 1976) p. 114.

643 Rodolfo Kusch, *Geocultura del hombre Americano*, *ibid.* p. 104.

infested hole behind an auditorium. There he had all sorts of old equipment (...) We need a radio in El Salvador (...) An AM station that can be heard right in the capital city (...) Before we'd even finished telling (Toño) about it, he was looking for a map of El Salvador to study the mountains, calculate distances, heights, valleys, the topography of our little country.⁶⁴⁴

The selection of phrases above illustrate an integration of fundamental importance to understand the interconnected knowledges, senses and perspectives which help to overcome a regular notion of radio and its properties. The socio-political situation forces and pushes for action towards the struggle to communicate by an unstoppable, omnipotent and immaterial liberated voice. Then, Toño appears, pictured as that romantic technical geek who dreams of soldering new worlds from his amateur studio. In the end, comes the presence of the topography of the territory and the knowledge of its mandates over the efficiency and reach of the airwaves.

The pictures available⁶⁴⁵ from the radio depict a sentiment which is far from the worries and preoccupations which one would expect from the battlefield which killed 75.000 people and lasted for more than 12 years.⁶⁴⁶ The short-wave transmitter was baptised as “El Vikingo”, which alongside an equipment constituted of “a broken engine, a 700-watt amplifier, a dipole antenna, a pocket-sized recorder, a single cassette of revolutionary music, [and] a microphone embedded in an old wooden cross that we found in an abandoned peasant house who had fled from the massacres of the governmental army”,⁶⁴⁷ formed the set-up of the nomadic and precarious studio that broadcast next to the Hondurean border. The radio initiated its broadcast with the phrase “Transmitting, Radio Venceremos, official voice of the *Frente Farabundo Martí para la Liberación Nacional*, emitting its guerilla signals from El Salvador, Central America, territory in combat against oppression and imperialism”.⁶⁴⁸ Once again, radio represents here the voice of the rebels in a “territory in combat”. The tropes seek to give meaning both to an abstraction and to geography, rendering them a sort of vivid soul which speaks and fights.

In these radios, we note that which Bruno Latour called a “nonmodern constitution”, the undistinguishable relation between the production of society and production of nature, not only by

644 José Ignacio Lopez Vigil, *Rebel Radio: The story of El salvador Radio Venceremos* (London: The Latin American Bureau, 1995) p. 3.

645 See: Museo de la palabra y la imagen of El Salvador: <<http://museo.com.sv/fototeca/wppaspec/oc1/cv0/ab8>>. Also, the University of Texas at Austin holds a collection of recordings of the radio at <<http://av.lib.utexas.edu/index.php?title=Category:1981>>

646 See: United Nations. Report of the UN Truth Commission on El Salvador, 2003. Available at: <<http://www.derechos.org/nizkor/salvador/informes/truth.html>>. Accessed in July, 2017.

647 Mariposa, ‘Un poco de historia de las radios guerrilleras en El Salvador’, Report from a former host of the radio. Available at: <<http://hunna.org/un-poco-de-historia-de-las-radios-guerrilleras-en-el-salvador/>>. Accessed in July, 2017.

648 “Transmite, Radio Venceremos, voz oficial del Frente Farabundo Martí para la Liberación Nacional, emitiendo su señal guerrillera, desde El Salvador, Centroamérica, territorio en combate contra la opresión y el imperialismo!!!” From Mariposa. *ibid.*

the fundamental political use of the electromagnetic spectrum, but by the inextricable relation to the landscape and its adaptation to it. The sound expanded by the use of the spectrum represents an instance of “translation between voice and landscape”, a “cognitive paradigm of systems of sign in the environment (physical contiguity and overload of inclusive alterities)”.⁶⁴⁹ This perspective of organic complementation of the individual as the birth of an environment is present also in the philosophy of the technique of Gilbert Simondon as transduction, or a process of “adaptation-concretization”.⁶⁵⁰ As I see it, the very oscillation and reverberation of matter through the emitted inconspicuous waves reveal what Simondon calls a ‘technogeographic’ environment. The techno-aesthetic function of the radio waves, besides manifested in human subjective perception, produces “this mixed environment that is at once technical and geographic”.⁶⁵¹ The waves that travels, occupy and give structuring function to space (think here on the social, cultural and political events within or without the reach of a radio station) can eventually – yet not essentially – be captured, produced, translated, codified and decoded by technical objects: “Vibrations always exceed the actual entities that emit them”.⁶⁵²

The relation of the physical and the semantic form, properties and qualities of the radio waves appear as a system of complex architecture, since it requires the participation in coexistence of technical, natural, spatial and sense perception. The construction of this coexistence is also contributor to the creation of new languages and dialogues. If we assume, like Caminitzer, that “the sense of the artistic is not given in objects, works or actions, but it is a complex network of significations woven in diverse webs and logics, as symbolic systems, economic and social relations and personal experiences”⁶⁵³ we must consider that spaces where life is lived are present in the constitution and usage of the spectrum and are privileged sites of aesthetic production.

Édouard Glissant remembers that the “Baroque speech, inspired by all possible speech”, can be identified in workplaces typical of the Latin American reality, such as the plantation, which he

649 Amálio Pinheiro, ‘O jornal na Paisagem’, *ibid.* pp. 92 – 94.

650 “The adaptation-concretization process is one which causes the birth of an environment rather than being the result of an already established environment. It is caused by an environment which had merely virtual existence before the invention. The invention happens because a jump is made and is justified by the relationship which is instituted within the environment it creates” Gilbert Simondon, *On the Mode of Existence of Technical Objects* (Paris: Aubier, Editions Montaigne, 1958), trans. by Ninian Mellamphy, (Ontario: University of Western Ontario, 1980). p. 48.

651 Gilbert Simondon, ‘On techno-aesthetics’, trans. by Arne De Boever, in *Parrhesia* (N.14, 2012) pp.1-8.

652 Steve Goodman, ‘The Ontology of vibrational force’, in Jonathan Sterne, ed., *The Sound Studies Reader* (New York: Routledge, 2012) p. 71.

653 “el sentido de lo artístico no está dado en unos objetos, en unas obras o en unas acciones, sino que es una compleja red de significaciones tejidas desde tramas y lógicas diversas, como los sistemas simbólicos, las relaciones económicas, las relaciones sociales y las experiencias personales y sociales, entre otras” Luis Camnitzer, *Conceptualism in Latin American Art: Didactics of Liberation* (Austin, Texas: University of Texas Press, 2007) p. 109.

compares to a “laboratory” where “we are able to discover a few of the formational laws of the cultural *métissage* that concerns us all”:

The Plantation, like a laboratory, displays most clearly the opposed forces of the oral and the written at work (...). It is there that multilingualism, that threatened dimension of our universe, can be observed for one of the first times, organically forming and disintegrating. It is also within the Plantation that the meeting of cultures is most clearly and directly observable, though none of the inhabitants had the slightest hint that this was really about a clash of cultures.⁶⁵⁴

The creation of spaces of “minor voices”, for the “smaller of the vulgar”, of the *damné de la terre*, are the very spaces of their existence. The solidarity created in shared spaces allows not only the distance from the egocentrism of the expression, proportioned by individualized technological devices of communication overpowered by the action of singular interfaces, but permits the habitation of a common environment where language is shared and recreated, engendering new aesthetic forms for expression. Just as the plantation - laboratory, the radio studio also refers to this baroque procedure, where the contiguity of the electromagnetic spaces makes possible the creation of new meanings. As a sacred and diabolic assemblage, its gnostic space “interprets, by a very strict relation with men, the nature as a form of a refinement, of a delicacy”.⁶⁵⁵ The amateur assemblage of gadgets, posters, graffiti and other technical apparatus, render the radio studio the aspect of a laboratory for language, expression and communication. They are not institutions, but practices of space which create what de Certeau calls “perambulatory gestures”.⁶⁵⁶ Certeau’s definition of the “language” created by non-discursive practices of such laboratories, leads to answers provided by controlled intervention of technical means in the social geography which are classified as experimentations.

Final Remarks

The intellectual organization regarding the electromagnetic spectrum as an infrastructure for technical communication follows the historical move which privileges colonial and industrial organization of geopolitics and capitalist global economy. The rationale present in this current instrumental conception led to States and their representatives (plenipotentiaries) to decide over the spatial allocation, fees, penalties, classifications as well as manners to use and explore the phenomena. Such modern-colonial organization suppressed many manifestations of spectrum’s

654 Édouard Glissant, *Poetics of Relation* (Ann Arbor: The university of Michigan Press, 2010) p. 74.

655 José Lezama Lima, *A expressão Americana* (São Paulo: Editora Brasiliense, 1988) p. 183.

656 See: Michel de Certeau, ‘Practices of Space’, in *Insights*, ed. by Marshall Blonsky (Baltimore: John Hopkins University Press, 1986).

perceptual characteristics as it obliterated its complex formation, behaviour, effects and sensibilities throughout the process of disenchantment of the spectrum.

A particular ideology which sustained the conception of an Anglo-Saxon romantic aesthetic combined with the power of nation-states and its tendency to operate spatial, subjective and economic domination was imprinted over the significance of wireless communication. Such conception has remains from the philosophical tradition about the symmetrical, divine and perfectly organized aethereal and pneumatic radiation from God, the Spirit or the Soul as organizers of material and human sensibilities. Therefore, we can induce that the political status of radio has an undeniable aesthetic dominant element, which is provided by the very definition imposed into its explanation. On the other hand, this work allowed us to notice that this aesthetic property of the spectrum should be considered in order to understand its political constitution as well as to provide new creations over its potentialities, demonstrated by the examples studied in this research.

Therefore, it is not just that “wireless technology is best understood, not as the result of any singular invention or discovery, but much more as the product of a set of cultural techniques and technologies that arose to address problems of first signalling at a distance”,⁶⁵⁷ but it is the very perception of what it means to “signalling” and the way in which such technical and geopolitical dynamics imprints the process of communication, that marks the dominant acceptance of radio waves management and usage. As such, the colonial process enforced the knowledge over the exploration of such technologies and the social processes which surrounded it as a political aesthetic in order to maintain a monopoly over the definition, and as consequence, over the use of the radio spectrum.

Because America – as a notion which embraces natural, human and sensory novelties – played a central role in Western modern accomplishments, it is expected that the criticism over both modernity and media should retain the viewpoint of its contributions in order to compose an analysis which is politically relevant in terms of the resistance to aesthetic, spatial and subjective domination. In this sense, the identification of a style for the American expression showed to be able to fuel the comprehension for the designation of the role of a “wireless” media as more than an instrument of romantic conception pointed out to a pure and unbiased communication. The ideas of demoniac, evil, savage and disordered arrangements should lose the manichaeian relation to divine, civilizational, celestial and ordered arrangements in order to understand the “appreciation of the supposed evil as ferment of good that would lead to find a proper form in the amorphous” and a

657 Erik Christopher Born, *Sparks to Signals: Literature, Science, and Wireless Technology, 1800–1930* (Berkeley: University of California, PhD Thesis, 2006). p. 100.

“heretic manner of finding civilization within the barbarian, but in a strictly culturologic terrain, therefore very far from our spiritual mediocrity”.⁶⁵⁸

Some lines of thought related to the Latin American intellectual production and criticism of colonial phenomena have been neglecting articulations between aesthetics, coloniality and media even though they emphasize dialogic, relational, transcultural and marginal voices as elements important to understand decolonial expressions of the sub-continent. The problem here is that the focus lies on an abstract notion of communication disregarding the material and technical conditions for it to happen. A counter-colonial perception of the spectrum is able to, as the hypothesis of this work raises, consider the tortuous and malleable form, its expressive and sensible properties and the practices which qualifies its messages in order to defy the current status of wireless communication, currently understood – even by its critics – as a unique phenomenon dictated by instrumental rationality, optimum allocation and restrictive legislation.

By identifying baroque aspects in the construction of the spectrum as a scientific, perceptual and historical phenomenon, we are therefore able to relate aspects of coloniality and the knowledge appropriated by the expansion of Western epistemology as an aesthetic battlefield which has demonstrated to be comprehended in order to reveal political potentialities of the spectrum. In this sense, what is proposed in this thesis, from the material observed in the research process, is a new optic and idiom for the relations among technology, discourse, knowledge and sensibility which privileges relations, unfolding and alliances from and for a peripheral perspective that enables us to think wireless communication differently: instead of an instrumental, neutral and logical set, a magnetized, powerful and enchanted landscape. Conceived as a “counter-colonial” aesthetics of techno-culture, this expression aims for “more elaborated and difficult forms (...), forms of expression more artistic and cult (...) in which the ordinary life is reflected towards the popular art” and which, in its gestures and notations, reveals itself as “baroque, ergotist and friend of the conceptual and the cryptic”.⁶⁵⁹

Thus, the conclusion withdrawn from this study affirms that the coloniality of power embedded in the conception of radio waves presents three main aspects. First, there is the technical order which presents the spectrum as an intangible, delicate and divine resource interpreted and operated only by specialists who harmonically translate it while allocating it optimally, allowing no

658 “Es la apreciación del supuesto mal como fermento del bien que llevaría a encontrar en lo amorfo una forma propia una manera herética de encontrar dentro de lo bárbaro a la civilización, pero en un terreno estrictamente culturoológico y por lo tanto lejos, muy lejos, de esta nuestra mediocridad espiritual”. Rodolfo Kusch, ‘Anotaciones para una estética de lo americano’, in *Obras Completas Tomo IV* (Rosario: Editorial Fundación Ross) p. 788.

659 “formas más elaboradas y difíciles (...) formas de expresión más cultas y artísticas (...) que se refleja en la vida ordinaria y hasta en el arte popular” “Barroca, ergotista y amiga de lo conceptual y de lo críptico” Uslar Pietri, ‘Lo Criollo en la literatura’, in *Nuevo Mundo, Mundo Nuevo*, *ibid.* p. 8.

interference. Thus, the spectrum is currently taken as being awakened only by industrial devices and commodities which essentially stand alone, unconnected with its nature. Such a Western defined technical cut hides its relation with the labour that produces its composites (metals, electronics, towers, studios) and with the economy moved by its function at the same time that it promotes hardware and software updates fit to disenchant and alienate the use of radio waves. Therefore, the current assumption of the spectrum shields its conflicts under the passive acceptance of what its very definition proposes.

Secondly, regarding its natural existence, the spectrum is seen as scarce natural resource, and as such, subtly justifies the fact that it is also concentrated in the hand of the industrial and media giant corporations. The coloniality of power and of knowledge imprints the idea of spectrum as independent to and separated from the human vital existence: a fortunate neutral parasite of the air, which, because unconnected to earthly nature and social determination, lead us to assume it as inoperable, unmodifiable and unreachable form of an invisible space. Hardly seen as central to environmental construction, the conceptual absence of the spectrum into the landscape – as if it was is nemesis – also forces the conception by which that if it were not for the modern technological and industrial universe, we would not have access to it.

Thirdly, in terms of its spiritual presence, the colonial aspect of the spectrum hides its religious prozelytist power behind its laic cloak. Since the modern conception of its existence (since it became disenchanting), the spectrum has been playing with spiritual powers in order to deliver secular, material and commodified interests. As such, this disenchanting aspect, although calculated based on divine symmetrical perfection, veils its multiple spiritual expressions while affecting the souls with modern prozelytist beliefs. Allegedly unconnected, unrelated and unconformable to its spiritual effects, it tends to hide or direct the commandments, adorations and magical manifestations under scientific innate qualities and religious capitalist objectives.

As a construction located in the birth of modernity and expansion of colonialism, the spectrum is conceived under the mark of this era in which Latin America and the colonial world played a central role in knowledge construction. Thus, as critique and oppositional conception, an alternative mode of interpreting, comprehending and conceptualizing the spectrum should come from the voices which were contributors to this modern world at the same time that presented its idioms, intelligibility and styles of resistance.

Therefore, this work proposes a conceptual aesthetics of the spectrum which are different from the formations we assume today in relation to its functioning as infrastructure of communication. Technically, we are able to identify spectral manifestations which are amateur,

sculptural and hand-made, acting as functionally extravagant and adaptable to different spaces and social conditions. Instead of delicate and highly protected, the spectrum appears here as a resolute and robust effect which naturally animates technical objects while rendering meaning to different social formations. As inevitable and vital for the very existence of technical operations and activations, the spectrum has been and can be – in this non-Western conception – an ordinary and mundane tactical instrument for the composition of everyday life. Finally, instead of a perspective of scarcity and patronage, this “counter-colonial” construction of spectrum’s technicality assumes the fact that there is spectral space in abundance, created and employed by a different technological practice. Likewise, as inseparable from nature, this perspective presupposes the spectral universe as abundant and fragmentary, improvised and popular. So, the spectrum emanates here its lively and vivid natural presence, which, like breath, warmth and look, is unfolded into a space where the spectrum allies with society in order to sculpt a landscape comprising both sky and earth. Finally, there is the understanding by which the spectral effect, from any range and width, carries a constant and material faith which must be affirmed. Instead of a shamefaced apparition of secular beliefs based on Anglo-Saxon asceticism, a counter-colonial version should assume the worship of different cosmologies and understandings which allocate its properties and qualities as a fundamental part of the reason. So, instead of an under-covered proselytism, the spectrum can be conceived as an ecumenical spirituality passive of diabolic and magical interference which become part of material and secular life in its many manifested forms.

In the search for this new style for the radio waves, I found the formulations of the Latin American neo-baroque, its heroic poverty, its real marvellous expressions, spiritual paradoxes and allegorical abundances as a way to uncover an aesthetic of the spectrum, taking back the baroque science which firstly formulated its existence and twisting it in the path of a new world baroque. In this sense, this study allows us to propose a new style for the conception of the radio waves while demonstrating that the legal, political and economic power over radio-waves also controls such aesthetic expressions of wireless communication.

Bibliography

- Adorno, Rolena. 1993. 'The Genesis of Felipe Guaman Poma de Ayala's *Nueva corónica y buen gobierno*', *Colonial Latin American Review*, 2, issue 1-2, 53-92
- Adorno, Rolena ———. 2000. *Guaman Poma: Writing and Resistance in Colonial Peru* (Austin: University of Texas Press, 2000)
- Adorno, Theodor W, *Aesthetic Theory* (Athlone Press, 1997)
- Agaitus, Daina and Lander, Dan, eds., *Radio Rethink: Art, Sound and Transmissions* (Banff, BC: Banff Centre for the Arts, 1994)
- Agamben, Giorgio, *The Man Without Content* (Stanford University Press, 1999)
- Aitken, Hugh G.J., 'Freeware: The Spectrum Project', *Antenna*, 6 – 2 (1994), 8-10
- Aitken, Hugh G.J., *Syntony and Spark: The Origins of Radio* (John Wiley and Sons, 1976)
- Appadurai, Arjun, *Modernity at large: cultural dimensions of globalization* (University of Minnesota Press, 2003)
- Arciniegas, Germán. 1969. *El caballero de El Dorado* (Madrid: Ed. de la Revista de Occidente)
- . 1969. *Latin America: A Cultural History*, trans. by Joan MacLean (London: The Cresset Press)
- . 1990. *Con America Nace la Nueva Historia*, Textos Escogidos (Bogotá: Tercer Mundo Editores)
- Aristotle, *De Anima*, trans. by R.D. Hicks (Cambridge: Cambridge University Press, 2015) 405a19.
- Arnheim, Rudolf, *Estética Radiofônica*, trans. by Manuel Figueras Blanch (Barcelona: Editorial Gustavo Gili, 1980)
- Ayala, Felipe Guaman Poma de, *The First New Chronicle and Good Government: On the History of the World and the Incas up to 1615*, trans. by Roland Hamilton (Austin: University of Texas Press, 2009).
- Badiou, Alain, *Handbook of inaesthetics*, trans. by Alberto Toscano (Stanford: Stanford University Press, 2005)
- Babha, Homi, *The Location of Culture* (London: Routledge, 1994)
- Baker, Geoffrey, and Tess Knighton, *Music and Urban Society in Colonial Latin America*, (Cambridge: Cambridge University Press, 2011)
- Bakhtin, Mikhail, *Estética da criação verbal* (São Paulo: Martins Fontes, 1997)
- Barbero, Jesus M., *Communication, culture and hegemony: from the media to mediations*, trans. by Elizabeth Fox and Robert A. White, intro. By Philip Schlesinger (London: SAGE Publications, 1993)
- Barbrook, Richard, *The Class of the new* (London: OpenMute, 2006)

- Baumgarten, Alexander Gottlieb. 1954. *Reflections on Poetry, A.G. Baumgarten's Meditationes Philosophicae de Nonnullis Ad Poema Pertinentibus*, trans., intro., and notes by Karl Aschenbrenner and William B. Holther (Berkeley: University of California Press)
- . 2013. *Metaphysics: A Critical Translation with Kant's Elucidations, Selected Notes, and Related Materials*, trans. and ed. by Courtney D. Gugate and John Hymers (New York: A&C Black)
- Beckjord, Sarah H, *Territories of History: Humanism, Rhetoric, and the Historical Imagination in the Early Chronicles of Spanish America* (Pennsylvania: Penn State University Press, 2010)
- Bell, Steven, and others, eds, *Critical Theory, Cultural Politics & Latin America* (University of Notre Dame Press, 2002)
- Bénétière, Jean, and Jacques Soncin, *Au cœur des radios libres* (Paris: L'Harmattan, 1989)
- Benjamin, Walter, *Selected Writings: 1927-1934*, (Harvard University Press, 2005)
- Beverly, John, Michael Aronna, and José Oviedo, *The Postmodernism Debate in Latin America*, (Durham: Duke University Press, 1995)
- Bhabha, Homi K, *The Location of Culture* (London and New York: Routledge, 2012)
- Blaut, James Morris, *1492: The Debate on Colonialism, Eurocentrism, and History* (Trenton, NJ: Africa World Press, 1992)
- Boever, Arne De, *Gilbert Simondon: Being and Technology* (Edinburgh: Edinburgh University Press, 2012)
- Boltanski, Luc, and Eve Chiapello, *The New Spirit of Capitalism* (London: Verso Books, 2005)
- Camnitzer, Luis, *Conceptualism in Latin American Art: Didactics of Liberation* (Austin, Texas: University of Texas Press, 2007)
- Campa, Roman de la, *Latin Americanism: Cultural Studies of the Americas* (Minneapolis: University of Minnesota Press, 1999)
- Carlson, John B., 'Lodestone Compass: Chinese or Olmec Primacy. Multidisciplinary analysis of hematite artefact from San Lorenzo, Veracruz, Mexico', in *Science Magazine* (vol.189, n.4205, 1975) 753-760
- Carpentier, Alejo. 1987. *A literatura do maravilhoso*, trans. by Rubia Goldoni and Sérgio Molina (São Paulo: Vértice)
- . 1991. *Obras completas de Alejo Carpentier: Conferencias* (Mexico City: Siglo Veintiuno Editores)
- . 2004. *América, la imagen de una conjunción* (Barcelona: Anthropos Editorial)
- . 2006. *The Kingdom of This World* (New York: Farrar, Straus & Giroux)
- . 2008. *Concierto Barroco*, 27th edn (Mexico City: Siglo Veintiuno Editores, 2008)
- Castillo, Bernal Diaz de, *The True History of the Conquest of New Spain, Vol 2-3* (New York: Cambridge University Press, 2010)
- Castro, Eduardo Viveiros de. 1996. 'Os pronomes cosmológicos e o perspectivismo ameríndio', *Mana*, Rio de Janeiro, 2 (2), 115-144.

- . 2007. 'Filiação intensiva e aliança demoníaca', *Novos estudos CEBRAP*, São Paulo, 77, 91-126
- Cazenave, François, *Les radios libres* (Paris: Presses Universitaires de France, 1980)
- Certeau, Michel de, *A invenção do Cotidiano: Artes de fazer*, trans. by Ephraim Ferrerira Alves (Petrópolis, RJ: Vozes, 1994)
- Certeau, Michel de, *Culture in plural* (London: University of Minnesota Press, 2001)
- Certeau, Michel de, *The writing of history* (Columbia University Press, 1988).
- Cesaire, Aime, *A Tempest: Based on Shakespeare's The Tempest*, trans. by Richard Miller (New York: Ubu Repertory Theater Publications, 1986)
- CIMCA/UNESCO. 1988. *Realidad y futuro de las radioemisoras mineras en Bolivia, Resultados del Simposio del mismo nombre*, realizado del 9 al 11 de noviembre de 1988, Potosí, La Paz
- Connor, Steven, 'Next to Nothing: The arts of the Air', in *Acoustic Territories: Sound Cultures and Everyday Life*, ed. by Brandon Labelle (New York: Continuum Books, 2010)
- Cortez, Hernan, *A conquista do México*, trans. by Jurandir Soares dos Santos (São Paulo: L&PM, 2011)
- Dabar, Ani, *Algo Más Sobre Literatura Y Realidad*, Accessed May 15, 2014, <http://anidabar.wordpress.com/2012/05/01/literatura-y-realidad/>,
- De Man, Paul, *Aesthetic Ideology*, ed. and intro. by Andrzej Warminski (University of Minnesota Press, 1996)
- Deleuze, Gilles. 2004. *Logic of Sense*, trans. by Hugh Tomlinson (New York: Continuum, 2004)
- . 2006. *The Fold*, (NY: Bloomsbury Academic, 2006)
- . 2008. *Kant's Critical Philosophy: The Doctrine of the Faculties*, trans. by Hugh Tomlinson and Barbara Habberjam (New York: Continuum, 2008)
- Deleuze, Gilles & Guattari, Félix, *Mil Platôs: Capitalismo e Esquizofrenia*, trans. by Ana Lúcia de Oliveira and others (Rio de Janeiro: Editora 34, 1997)
- Deleuze, Gilles & Guattari, Félix, *What is philosophy*, trans. by Hugh Tomlinson and Graham Burchill (London: Verso Books, 2003)
- Derrida, Jacques. 1976. *Of Grammatology*, trans. by Gayatri Chakrovorty Spivak (Baltimore: Johns Hopkins University Press)
- . 1998. *The Derrida Reader: Writing Performances* (University of Nebraska Press, 1998)
- Descola, Philipe, *The Ecology of Others*, trans. by Genevieve Godbout and Benjamin P. Luley (Chicago: Prickly Paradigm Press, 2013)
- Díaz del Castillo, Bernal, *The True History of the Conquest of New Spain*, trans., intro., and notes by Janet Burke, and Ted Humphrey (Indianapolis: Hackett Publishing, 2012)
- Dorfman, Ariel. 1986. *De elefantes, literatura y miedo: la comunicación americana* (Havana: La Casa de las Americas)
- . 1991. *Some write to the future: essays on contemporary Latin American fiction*, trans. by George Shivers with the autor (Durham and London: Duke University Press, 1991)

- Durix, J.-P., *Mimesis, Genres, and Post-Colonial Discourse: Deconstructing Magic Realism* (Macmillan, 1998)
- Dussel, Enrique D, and Eduardo Mendieta, *The Underside of Modernity: Apel, Ricoeur, Rorty, Taylor, and the Philosophy of Liberation*, (Humanity Books, 1999)
- Eagleton, Terry, *The Ideology of the Aesthetic*, (Blackwell, 1990)
- Ellul, Jacques, *The Technological Society* (New York: Vintage Books, 1964)
- Enzensberger, H. M. 1974. *The Consciousness Industry: On Literature, Politics and the Media*, ed. by Michael Roloff (Seabury Press, 1974)
- . 1992. *Critical Essays* (NY: Continuum)
- Foster, Hal, ed., *The Anti-Aesthetic: Essays on Postmodern Culture* (The New Press, 1998)
- Franco, Jean, *The modern Culture of Latin America* (London: Penguin Book, 1970)
- Fredric Jameson. 1983. 'Postmodernism and Consumer Society', in *The Anti-Aesthetic: Essays on Postmodern Culture*, ed. by Hal Foster (New York: The New York Press, 1983)
- Freudenthal, Gad, 'Theory of Matter and Cosmology in William Gilbert's *De magnete*', *Isis*, 74, 1 (Mar. 1983), 22-37
- Gal, Ofer and Chen-Morris, Raz, *Baroque Science* (London: University of Chicago Press, 2013)
- García-Bedoya, Carlos, *Los estudios culturales en debate: Una mirada desde América Latina* (CELAP, 2001)
- Geerts, Andrés and Van Oeyen, Víctor, *La radio popular frente al nuevo siglo: estudio de vigencia e incidencia* (Asociación Latinoamericana de Educación Radiofónica, 2001)
- Geniets, Anne, *The Global News Challenge: Market Strategies of International Broadcasting Organizations in Developing Countries* (London and New York: Routledge, 2013)
- Gilmore, Paul, *Aesthetic Materialism: Electricity and American Romanticism* (Stanford: Stanford University Press, 2009)
- Gomes, Santiago C., *Critica de la razon latinoameircana* (Puvill Libros SA, s/d)
- Gracyk, Theodore, *Aesthetics of Popular Music* (Internet Encyclopedia of Philosophy, 2008)
- Greenblatt, Stephen. 1993. *New World Encounters* (Berkeley and Los Angeles: University of California Press, 1993)
- . 2008. *Marvelous Possessions: The Wonder of the New World* (Chicago: University of Chicago Press, 2008)
- Gruzinski, Serge, *Las cuatro partes del mundo: Historia de una mundialización*, (Fondo de Cultura Economica, 2010)
- Guattari, Félix, and Suely Rolnik, *Micropolítica: cartografías del deseo*, trans. by Florencia Gómez (Madrid: Traficantes de sueños, 2006)
- . 2008. *Molecular Revolution in Brazil*, trans. by Karel Clapshow and Brian Holmes (Cambridge, MA, and London: Semiotext(e), 2008)
- Guattari, Félix. 1984. *Molecular Revolution: Psychiatry and Politics*, trans. by Rosemary Sheed (London: Penguin Books, 1984)

- . 1995. *Chaosmosis: An Ethico-Aesthetic Paradigm*, trans. by Paul Bains and Julina Pefanis (Bloomington and Indianapolis: Indiana University Press, 1995)
- Guha, Ranajit, and Gayatri Chakravorty Spivak, *Selected Subaltern Studies* (Oxford: Oxford University Press, 1988)
- Gumbrecht, Hans Ulrich, and Karl Ludwig Pfeiffer, *Materialities of Communication* (Stanford: Stanford University Press, 1988)
- Habermas, Jürgen, ‘Technology and Science as ‘Ideology’’, in *Towards a Rational Society* trans. by Jeremy J. Shapiro (Boston: Beacon Press, 1970)
- Hegel, G. W., *Aesthetics, Lectures on Fine Art*, trans. by T. M. Knox (Clarendon Press, 1975)
- Hegel, G. W., *Phenomenology of Spirit*, in. *The Hegel Reader*. (Oxford: Blackwell Publishing, 1998)
- Hegel, G. W., *Lectures on the Philosophy of World History* (Cambridge: Cambridge University Press, 1975)
- Hoggart, Richard, *Schools of English and Contemporary Society: An Inaugural Lecture Delivered* in The University Of Birmingham (University Of Birmingham, 1963)
- Horkheimer, Max, and Adorno, Theodor W., *Dialectic of Enlightenment: Philosophical Fragments* (Stanford: Stanford University Press, 2002)
- Huesca, Robert, *A procedural view of participatory communication: lessons from Bolivian miners’ radio* (London: SAGE Publications, 1995)
- Hume, David, *A Treatise of Human Nature*, ed. by David Fate Norton and Mary J. Norton (Oxford University Press, 2000)
- Jameson, Fredric. 1996. *Pos-modernismo: a Lógica Cultural do Capitalismo Tardio*, trans. by Maria Elisa Cevalco (São Paulo: Ática, 1996)
- Jensen, Don, *Sketches of South American Radio* (FRIENDX, 1965)
- Joughlin, John and Malpas, Simon, eds., *The New Aestheticism* (Manchester University Press, 2003)
- Joyce, Zita, *Creating order in the ceaseless flow: The discursive constitution of the radio spectrum* (University of Auckland, 2008)
- Kahn, Douglas, *Earth Sound Earth Signal. Energies and Earth Magnitude in the Arts* (Los Angeles: University of California Press, 2013)
- Kahn, D., and Whitehead, G., eds., *Wireless Imagination, Sound, Radio and the Avantgard* (Cambridge and London: MIT Press, 1992)
- Kant, Immanuel, *Critique of Judgement*, trans. and intro. by Werner S. Pluhar (Indianapolis and Cambridge: Hackett Publishing Co., 1987)
- Keith, Michael C., ed., *Radio Cultures: The Sound Medium in American Life* (Peter Lang, 2008)
- Kellner, Douglas, *Media Culture: Cultural Studies, Identity and Politics Between the Modern and the Post Modern* (London and New York: Routledge, 1995)
- King, Edward & Page, Joanna, *Posthumanism and the graphic novel in Latin America* (London: UCL Press, 2017)

- Kittler, Friedrich, *Gramophone, Film and typewriter* (California: Stanford University Press, 1999)
- Kupperman, Karen Ordahl, *America in European Consciousness, 1493-1750* (Chapel Hill: University of North Carolina Press, 1995)
- Kusch, Rodolfo, *Geocultura del hombre americano* (Buenos Aires: Fernando García Cambeiro, 1976)
- Lamming, George, *Caribbean Reasonings: The George Lamming Reader – The Aesthetics of Decolonisation*, ed. by Antony Bogues (Kingston, Jamaica: Ian Randle Publishers, 2011)
- Las Casas, Bartolomé, *A Short Account of the Destruction of the Indies*, trans. by Nigel Griffin (London: Penguin Books, 2004)
- Lefebvre, Thierry, *La Bataille des radios libres: 1977-1981* (Paris: Nouveau Monde éditions, 2011)
- Levin, Harvey J., *The invisible Resource: Use and regulation of the radio spectrum* (London and NY: RFF Press, 1971)
- Liebert, Elizabeth, and Lescher, Bruce H., eds., *Exploring Christian Spirituality: Essays in Honor of Sandra M. Schneiders* (New York: Paulist Press, 2006)
- Lima, Lezama. 1981. *Imagen y posibilidad* (Havana: Letras Cubanas, 1981)
- . 1998. *A expressão americana*, trans. by Irlemar Chiampi (São Paulo: Brasiliense, 1998)
- Lovink, Geert, *Zero Comments: Blogging and Critical Internet Culture* (London and New York: Routledge, 2013)
- Machado, Arlindo, and Magri, Caio, and Masagão, Marcelo, *Rádios Livres: Reforma Agrária no Ar* (São Paulo: Brasiliense, 1986)
- Magasich-Airola, Jorge, and De Beer, Jean-Marc, *America Magica: When Renaissance Europe Thought It Had Conquered Paradise* (London: Anthem Press, 2007)
- Malmström, V. H., *Cycles of the sun, mysteries of the moon* (Austin: University of Texas Press, 1997)
- Manovich, L., *The Language of New Media* (Cambridge and London: MIT Press, 2001)
- Maravall, José Antonio, *Culture of the Baroque. Analysis of a historical structure* (Mineapolis: University of Minnessota Press: 1986)
- Marcuse, Herbert. 1978. *The aesthetic dimension : toward a critique of Marxist aesthetics* (Boston: Beacon Press, 1978)
- . 2001. *Towards a critical theory of society* (London and New York: Routledge, 2001)
- . 2007. *Art and Liberation* (London and New York: Routledge, 2007)
- Mariategui, Jose Carlos. 1960. *Temas de Nuestra America* (Lima: Biblioteca Amauta, 1960)
- . 1975. *Sete ensaios de interpretação da realidade peruana* (São Paulo: Alfa-Omega, 1975)
- Marquez, Gabriel Garcia, *Leaf Storm: And Other Stories*, trans. by Gregory Rabassa and J. S. Bernstein (NY: HarperCollins, 2005)

- Martí, José, *Nuestra América* (Editora Ariel, 1973)
- Martin, David L., *Curious Visions of Modernity: Enchantment, Magic, and The Sacred* (Cambridge: The MIT Press, 2011)
- Marx, Karl, and Engels, Friedrich, *The German Ideology: Together with Marx's "Introduction to a Critique of Political Economy"*, trans. by Christopher John Arthur (London: Lawrence & Wishart, 1970)
- Marx, Karl, *Economic and Philosophic Manuscripts of 1844* (New York: Start Publishing LLC, 2013)
- Marvin, Carolyn, *When Old Technologies Were New. Thinking About Electric Communication in the Late Nineteenth Century* (Oxford: Oxford University Press, 1988)
- Maxwell, James Clerk, *A Treatise on Electricity and Magnetism* (Dover Book on Physics, 1954)
- Menchú, Rigoberta, *I, Rigoberta Menchú: An Indian Woman in Guatemala*, ed. and intro. by Elisabeth Burgos-Debray, trans. by Ann Wright (London: Verso Books, 1984)
- Mendel, Toby, *Tuning into development: International Comparative Survey of community broadcasting regulation* (Halifax: Centre for Law and Democracy, UNESCO Digital Library, 2013)
- Mignolo, Walter D. 1995. *The Darker Side of Renaissance: Literacy, Territoriality and Colonization*, (Ann Arbor: University of Michigan Press, 1995)
- . 2003. *Historias locales, diseños globales: colonialidad, conocimientos subalternos y pensamiento fronterizo* (Buenos Aires: Akal, 2003)
- . 2005. *The idea of Latin America* (Oxford: Blackwell Publisher, 2005)
- Mignolo, Walter D., and Arturo Escobar, *Globalization and the Decolonial Option* (London and New York: Routledge, 2013)
- Moraña, Mabel, and Dussel, Enrique D., and Jáuregui, Carlos A., eds., *Coloniality at Large: Latin America and the Postcolonial Debate* (Durham: Duke University Press, 2008)
- Moreiras, Alberto, 'Pastiche Identity and Allegory of Allegory', in *Latin American Identity and the Constructions of Difference*, ed. by Amaryll Chanady (Minneapolis and London: University of Minnesota Press, 2004)
- Morse, Richard M., *O espelho de Próspero: Cultura e idéias nas Américas*, trans. by Paulo Neves (São Paulo: Cia. das Letras, 1995)
- Mowitz, John, *Radio: Essays in Bad Reception* (Berkeley and Los Angeles: University of California Press, 2011)
- Nelson, Dan, 'Temples, Turtles and Fat Boys: The origins of Mesoamerican mother culture' (Dartmouth Alumni Magazine, vol. 72, n.1, 1979) 36-38
- Newton, Isaac, 'A Letter of Mr. Isaac Newton, Professor of the Mathematicks in the University of Cambridge; Containing His New Theory about Light and Colors', in *Philosophical Transactions of Royal Society* (London: vol.6, n.69-80, 1671)
- Nuccetelli, Susana, and Schutte, Ofelia, and BUENO, Otávio, eds., *A Companion to Latin American Philosophy*, (Oxford: Wiley-Blackwell, 2013)

- O'Connor, Alan. 1990. 'The Miners' Radio Stations in Bolivia: A Culture of Resistance', *Journal of Communication*, 40 (1990), 102–110
- . 2004. *Community Radio in Bolivia: The Miners' Radio Stations* (NY: Edwin Mellen Press, 2004)
- . 2006. *The Voice of the Mountains, Radio and Anthropology* (Lanham, Maryland: University Press of America, 2006)
- O'Gorman, Edmundo, *A invenção da América: reflexão a respeito da estrutura histórica do Novo Mundo e do sentido do seu devir*, trans. by Anna Maria Martinez Corrêa (São Paulo: Ed. Unesp, 1992)
- Persson, Hans-Åke, and Bo Strath, eds., *Reflections on Europe: Defining a Political Order in Time and Space* (Brussels: Peter Lang S.A., 2007)
- Peters, John Durham, *Speaking into the air: a history of the idea of communication* (Chicago: University of Chicago Press, 1999)
- Peters, John Durham, *The marvellous clouds: Towards a philosophy of elemental media* (Chicago: The University of Chicago Press, 2015)
- Pietri, Arturo Uslar. 1998. 'La tentativa desesperada de Jaymes Joyce', in *Nuevo Mundo, Mundo Nuevo*, ed. by José Ramón Medina (Caracas: Biblioteca Ayacucho, 1998)
- . 1999. *La Creación del Nuevo Mundo* (Mexico City: Fondo de Cultura Económica, 1999)
- Pizarro, Ana, *América Latina: palavra, literatura e cultura* (Campinas: Editora da Unicamp, 1995)
- Ponge, Robert, ed., *Surrealismo e Novo Mundo* (Porto Alegre: Editora da UFRGS, 1999)
- Quijano, Aníbal. 1990. *Modernidad, Identidad y utopía em America* (Quito: El Conejo, 1990)
- . 2000. 'Coloniality of Power, Eurocentrism, and Latin America', in *Nepantla: Views from South*, v. 1, Issue 3, 533-580 (Durham: Duke University Press)
- Rabasa, José, *Inventing America: Spanish Historiography and the Formation of Eurocentrism*, (Norman and London: University of Oklahoma Press, 1993)
- Rama, Angel, *Transculturación narrativa en America latina* (Mexico City: Siglo Veintiuno, 1982)
- Ramos, Julio, *Desencuentros de la modernidad en América Latina* (Mexico City: Fondo de Cultura Económica, 1989)
- Rancière, Jacques. 2004. *The Politics of Aesthetics*, ed. and trans. by Gabriel Rockhill (London and NY: Bloomsbury, 2004)
- . 2009. *Aesthetics and Its Discontents*, trans. by Steven Corcoran (Cambridge and Malden: Polity Press, 2009)
- Retamar, Roberto Fernandez, *Caliban and Other Essays*, trans. by Edward Baker (Minneapolis: University of Minnesota Press, 1989)
- Retamoso L., Dulfredo, *Community Radio in Bolivia: the Miners' Radio Stations: Chronicle of a Miners' Radio Station*, ed. by Alan O'Connor (NY: The Edwin Mellen Press, 2004)
- Rodó, José Enrique, *Ariel*, trans. by Denise Bottman (Campinas: Editora da Unicamp, 1999)

- Ross, Alison, *The Aesthetic Paths of Philosophy*, (Stanford University Press, 2000)
- Saisselin, Rémy G, *The Enlightenment Against the Baroque: Economics and Aesthetics in the Eighteenth Century* (Berkeley and Los Angeles: University of California Press, 1992)
- Sakolsky, Ron, *Seizing the Air Waves: A Free Radio Handbook* (Chico, California: AK Press, 1998)
- Sarto, Ana Del, and Ríos, Alicia, and Trigo, Abril, eds., *The Latin American Cultural Studies Reader* (Durham: Duke University Press, 2004)
- Schiller, Friedrich, *On the aesthetic education of man, Twentieth Letter*, trans. and intro. by Reginald Snell (Mineola, NY: Dover Publications, 2004)
- Shohat, Ella, and Stam, Robert, *Unthinking Eurocentrism: Multiculturalism and the Media*, (London and New York: Routledge, 1994)
- Simondon, Gilbert, *L'individuation à la lumière des notions de forme et d'information* (Paris: Editions Jérôme Millon, 2005)
- Soley, Lawrence C., *Free Radio: Electronic Civil Disobedience* (Boulder, Colorado: Westview Press, 1999)
- Solmsen, Friedrich, 'The Vital Heat, the Inborn Pneuma and the Aether', in *The Journal of Hellenic Studies*, (vol.77, Part 1, 1957)
- Sterling, Christopher H., Cary O'Dell, eds., *The concise Encyclopedia of American Radio* (New York: Routledge, 2010)
- Strauss, Neil, and Allen Weiss, and Phantasmic Radio, eds., *Radiotext(e)* (Durham: Duke University Press, 1995)
- Street, Seán, *The Poetry of Radio: The Colour of Sound* (London and New York: Routledge, 2012)
- Taussig, Michael. 1987. *Shamanism, Colonialism, and the Wild Man, A study in terror and healing*, (Chicago: The University of Chicago Press, 1987)
- . 1993. *Mimesis and Alterity: A Particular Studies of the Senses*, (London and New York: Routledge, 1993)
- . 2010. *The Devil and commodity fetishism in South America*, (Chapel Hill: The University of North Carolina Press, 2010)
- Teflon, Zeke, *The Complete Manual of Pirate Radio* (Tucson: See Sharp Press, 1993)
- Thompson, E. P. *Customs in Common* (London: Penguin Books, 1993)
- Todorov, Tzvetan, *The Conquest of America: the question of the other*, trans. by Richard Howard (NY: Harper Perennial, 1984)
- Tomlison, Gary, *The singing of the new world: Indigenous Voices in the era of European Contact*, (Cambridge: Cambridge University Press, 2007)
- Vasconcelos, José, *The Cosmic Race / La Raza Cosmica: a bilingual edition* (Baltimore: Johns Hopkins Univeristy Press, 1997)

- Vigil, José Ignacio López, and Mark Fried, and Radio Venceremos, *Golpe de Radio: Los Tres Días Que Transmitimos Peligrosamente* (Asociación Latinoamericana de Educación Radiofónica, 2006)
- Vigil, José Ignacio López, and Mark Fried, and Radio Venceremos, *Rebel Radio: The Story of El Salvador's Radio Venceremos*, (Evanston, Illinois: Curbstone Press, 1994)
- Weber, Max, *A ética protestante e o espírito do capitalismo*, trans. by Irene de Q. F. Szmrecsányi and Tomás J. Szmrecsányi (São Paulo: Pioneira, 1996)
- Weiss, Allen S., *Experimental Sound and Radio* (Cambridge and London: MIT Press, 1996)
- Williams, Raymond, *Cultura*, 3rd. ed., trans. by Lólio Lourenço Oliveira (Rio de Janeiro: Paz e Terra, 2008)
- Young, Thomas, 'The Bakerian Lecture. Experiments and calculations relative to physical optics' in. *Philosophical Transactions of the Royal Society* (London: vol.94, 1804)
- Young, Thomas, *A course of lectures on natural philosophy and the mechanical arts* (London: William Savage, Bedford Bury, 1807)
- Zea, Leopoldo. 1976. *Filosofía y Cultura Latinoamericanas* (Centro de Estudios Latinoamericanos 'Romulo galegos', 1976)
- . 1986. *América Latina y sus ideas*, (Mexico and Paris: Unesco/Siglo Veintiuno, 1986)
- Zielinski, Siegfried, *Deep Time of the Media: Toward an Archeology of hearing and seeing by technical means* (The MIT Press, Cambridge: 2006)