1-1-2013

The Projector's Noises: A Media Archaeology Of Cinema Through The Projector

Kelly F.W. Egan
Ryerson University

THE PROJECTOR'S NOISES: A MEDIA ARCHAEOLOGY OF CINEMA
THROUGH THE PROJECTOR

by

Kelly Fawn Weiss Egan

Certificate in Film Preservation, George Eastman House, 2012

Master of Fine Arts, Bard College, 2006

Master of Arts, York Universitiy, 2003

Bachelor of Arts, Carleton University, 2001

A dissertation

presented to Ryerson University and York University

in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy
in the Program of
Communication and Culture

Toronto, Ontario, Canada, 2013

Author's Declaration

I hereby declare that I am the sole author of this dissertation. This is a true copy of the dissertation, including any required final revisions, as accepted by my examiners.

I authorize Ryerson University to lend this dissertation to other institutions or individuals for the purpose of scholarly research

I further authorize Ryerson University to reproduce this dissertation by photocopying or by other means, in total or in part, at the request of other institutions or individuals for the purpose of scholarly research.

I understand that my dissertation may be made electronically available to the public.

The Projector's Noises: A Media Archaeology of Cinema Through the Projector
Kelly Fawn Weiss Egan
Doctor of Philosophy, 2013
Communication and Culture
Ryerson University and York University

Abstract

This dissertation provides a media archaeology of the film projector, concentrating on the conceptualization and use of projector noise through the lens of the modernist and contemporary avant-garde, that offers new ways of understanding cinema, interpreting embodied cinematic space, and extending the discourse on audiovision in general. Looking toward the projector allows us to see how it is a productive labourer in the construction of cinematic experience. Listening to its noises— which have been framed as insignificant and/or unwanted—allows us to understand the way cinema is in fact a performative art with a certain kind of liveness. Part One of this dissertation traces an alternative history of cinema focused on the projector beginning with the pre-cinema technologies of the camera obscura, the telescope and the magic lantern. Part Two analyzes how the avant-garde has engaged with the projector-as-instrument during three major technological transitional moments in cinema: first, early cinema and the rise of the Cinématographe by looking at the Italian futurists, specifically Arnaldo Ginna and Bruno Corra's interest in the projector-as-instrument and the relationship between the Cinématographe and Luigi Russolo's *intonarumori*; second, the advent of sound-on-film technology and how it was used to produce synthetic noises by Oskar Fischinger, László Moholy-Nagy, Peter Kubelka and the author; and third, at the moment of the digital transition filmmakers like Bruce McClure and Karl Lemieux who have returned to explore the performativity and materiality of the projector in their artwork. At a time when the discourse of cinema is rife with rhetoric proclaiming its death (under threat of the digital revolution), this dissertation serves to establish that film is far from dead; through the projector-as-instrument, the future is bright…and very noisy.

Dedication

      This dissertation is dedicated to my mother, Sue Weiss, for her love, support and encouragement which provided me with the drive to pursue higher education, without which I would never have begun this research (I wish she could have seen its completion), and to my father, Rick Egan, for his continued strength, love and support over these trying years, without which I would never have finished this project.

Table of Contents

List of Figures

List of Appendices

Introduction

On the Projector's Noises and Other Creative Transgressions in Cinema

0.1 Object of Analysis

From the earliest moments of cinema, the projector has played a significant role. As I will argue throughout this dissertation, the projector is the key instrument in the *performativity* and *liveness* of cinema and, as such, the key figure in the *production of cinematic space*. However, in the mainstream film industry, and in film and media studies, the projector has been neglected. It has been considered a benign machine, a technology of amplification the primary function of which is to "play back" messages previously inscribed on the filmstrip by the camera, while the camera has been understood for the purposes of analysis and theory as the central cinematic technology. The goal of this dissertation is to begin to perform a media archaeology of cinema, looking at the medium through the lens of the projector to understand it as an expressive and/or projected art. My focus is on the modernist and contemporary avant-garde because of the avant-garde's history and capacity to explore the conceptual and material parameters of a medium and technology helps to conceptualize the projector's potentials. Moreover, the deliberate and self-reflexive practice of avant-garde artists, as I will explore in Part 2 of this dissertation, illuminates critical issues that can productively inform how we might rewrite the history of cinema and media when we take the projector as the fulcrum.

My interest in projectors is at once personal and scholarly. As a maker of cameraless films, I construct my filmstrips by hand with no other inscriptive technological aids. This is perhaps why I find the projector such an obvious and rich topic for the analysis of cinema. The projector is the primary film technology with which I engage to *make* motion pictures as it is the instrument that sets my otherwise plastic images in motion. More generally, the projector is what makes any kind of motion picture perceivable: it moves the static frames on the filmstrip (which can be either

photographic images produced by a camera or animations made by hand); it produces the light

which amplifies those frames over the theatre space and onto the screen; it produces the social

aspect of cinema insofar as it allows the audience the ability to watch, as a group, the same film at

the same time in the same physical environment. The projector reads and translates the sound

inscribed on the film's soundtrack, and amplifies that sound for the audience. The projector is the

heart of cinema. It circulates life to and connects all organs of the cinematic body.

Looking at the projector creates a need to revise and revisit some of the fundamental

assumptions and mythologies of film history, which look at cinema primarily through the camera-

eye. Thinking about the projector-as-producer—as an active laborer in the creation of the system

network known as cinema—changes the way we think about the medium of film. One purpose of

this dissertation is to address how the experience of cinema and consequently how we think about it

is negotiated through this aspect of media technology. This dissertation concentrates on the role of

the projector as an active, constructive and dynamic laborer in the production of cinematic space,

and how this production of space is changed by technological innovation. My goal is to rehistoricize

the emergence of the cinematographic arts within a history of *projected arts*, i.e., from a projector-

based and/or expressive-based perspective that develops a new area of research in film and media

studies. This look at the projector concentrates, therefore, on what it *produces*, on the projector as

producer, and therefore as a productive actor in cinema. I have focused on the projector's noises as

an aspect of cinema that, in being disavowed, contribute to a greater understanding of the socio-

technological history of the medium. This focus allows for a materialist reading of cinema based on

a specific (and typically undesired) essential quality embedded within the medium.

One of the contexts of my inquiry has to do with current disciplinary and cultural anxieties

about the death of cinema at the moment where everything seems to be transforming towards the

digital, worries that are rooted in media-specificity.[1] While I am not convinced that film (i.e., the

material photochemical celluloid based filmstrip) is in danger of extinction, as I will discuss shortly,

it is clear that film technology is in the midst of an identity crisis. My research on the projector

suggests that in periods of technological transition in cinema, artists have been similarly interested in

exploring the performative and experiential aspects of the projector. What is interesting to me is the

way that with the transition to digital, contemporary artists have returned to practices similar to

those presented by artists at the birth of cinematic technology by exploring new meanings of film

technology using the materiality of the projector and its noises in live performances. Through a

comparison of older and more recent responses to changing projection technology, it is possible to

approach the socio-technological dynamics of cinema and see the deep time (to use Siegfried

Zielinski's influential term) through which its identity has emerged.[2]

0.1.1 On the Death of Film/Cinema in the Digital Age

The "death of film" has been a trope in recent scholarship in the fields of film studies, media

studies, visual studies, modernist studies, and archive studies. This trope has flirted with apocalyptic

rhetoric—like all other "death of…" media discourses (i.e., the death of the book, the death of

television, the death of industrial/manual labour in developed nations)—pronouncing with nostalgia

and sentimentality the collapse of "the world as we know it" (i.e., visual space as experience through

film as a material medium of inscription and expression), and the insurgence of a "new way of

---

[1] This thesis does assume that *film* (photochemical-based motion picture, typically stored on celluloid filmstock) as well as *video* (electronically-based motion picture, typically stored/played back on magnetic stock) and *digital* (pixel-based motion picture, typically stored as binary code) are all medium-specific forms of art.

[2] For Zielinski, media can be considered within a "deep time," which may exceed its practical life, in which the technology may affect the future and past envisioning of other media. His concept of deep time, which I flesh out further in this dissertation, is used to describe this flexible imagined concept of time and history. Siegfried Zielinski, *Deep Time of the Media: Toward an Archaeology of Hearing and Seeing by Technical Means* (Cambridge, Massachusetts: The MIT Press, 2006).

seeing/being" (i.e., acoustic space as experienced through electronic/digital media as an transcendental landscape). Within this rhetoric, the discourse of authenticity is often used to reify and edify the past, suggesting that there is something more "real" and "authentic" in that which has been "lost," and that celluloid-based cinema produces an inherently true experience that digital media is incapable of reproducing.[3] The transition from the celluloid-based filmic experience to digital cinema will have repercussions, insofar as the performative, cinematic space of each medium differs based on the respective materiality they each produce.

However, instead of focusing on the death of film, I want to draw attention to the effects of this particular moment on the avant-garde, because, as my dissertation suggests, this stage of cinema-as-projection/projected (i.e., the exhibition/exhibitionist moment in cinema) is the key moment for avant-garde cinema. In fact, it might be said that avant-garde cinema *happens* in the space of its projection. My discussion will explore three distinct transitory moments in cinema technology by focusing on the artistic uses and/or interference generated from these technological transitions: first, early cinema and the avant-garde's development of cinematic space as performative; second, sound-on-film technology which gave voice to the projector and allowed the avant-garde to develop animated sound; and finally, the digital transition, wherein the very definition of "cinema" may be forever changed, and has inspired a return to the materiality of projection and the performative moment in film exhibition. While in my chapter on the digital transition it is not my purpose to engage in the diatribe regarding what is "lost" with digital cinema, the final analytic chapter of this dissertation will begin to address the differences between the two technologies (film projectors and D-Cinema projectors specifically), adding to my wider argument about how the idiosyncrasies of the film projector have historically been taken up by the avant-garde, and what the

---

[3] This argument is similar to the attacks on the photographic arts in the early to mid twentieth century, when the photograph was viewed as incapable of reproducing an authentic depiction of life and/or the moment, which lead to the powerful link between early photography and spiritualism.

4

digital transition means for our bodily engagement within cinematic space (which, I will argue, is grounded in the projector's noises).

There is no doubt that the definition of cinema's material composition, the materiality of the apparatus, is shifting within the digital transition; however, it is the film projector and not the filmstrip[4] that is the key figure in peril. The undermining of film within the film industry will not be based on the means of producing and recording content—although in the past year we have seen a notable decrease in the manufacturing of celluloid film cameras. Instead, it will be based on the means of distribution and exhibition, as the studio system stops manufacturing release prints on celluloid, and movie theatres' transition from 35mm film projectors to their digital counterparts. But even more than the material, what is really at stake is the way we *think* about film. There is something tangible to celluloid film, a materiality, a body that seems to be lacking in digital media. While one should not argue for the immateriality of digital media, for our bodies do indeed engage with digital media, which itself does have "body" with which we interact, the film projector's noises engender an acoustic experience that stations the observer's body within the material world in a way that digital projectors and devices cannot duplicate.

From the perspective of the filmmaker, there are apparent and tangible technical ramifications from the death of film: i) no more celluloid film (a result of the failing commercial film production industry, marked by the recent bankruptcy of the photographic chemical giant Kodak, and expedited by the transition to D-Cinema as the projection standard in movie theaters); ii) no more celluloid film cameras (as marked by the cease in production of film cameras by ARRI, Aaton and Panavision within the past few years); and iii) no more celluloid film projectors (as marked by the striking removal of the behemoth 35mm projectors from both first run and repertory theatres,

---

[4] The best way to conserve moving images (i.e., most lasting and most stable method) is still on film. Filmstock, therefore, will continue to have commercial use as an archival medium for preservation. These archival prints, however, are not meant for projection, but for the creation of digital viewing copies.

to be replaced by equally enormous digital machines). That said, much of the hype about the death of cinema has been greatly exaggerated. Motion picture is one of Kodak's only moneymakers; not only has production continued on manufacturing Super 8, 16mm, 35mm and 70mm filmstock, but Kodak is continuing to research ways to improve archival stocks. Unfortunately, Fuji will be discontinuing its motion picture product live as of March 2013.[5] However, as was the case with Polaroid instant film, if the large corporate manufactures stop production, an artisan company will likely step in to pick up the slack. A few independent and avant-garde filmmakers are already experimenting with making and spreading their own emulsion on discarded clear leader. Secondly, because of the mechanical nature of film cameras, their physical longevity, and the availability of technicians capable of fixing any mechanical and/or optical problem, the termination of the production of film cameras is not the most pressing concern for most avant-garde filmmakers. We have cameras and, for now, they work. The third technological impediment is more concerning: if venues purge their celluloid film projectors, how can we, as filmmakers, screen our work? This is more of a concern for large gauge filmmakers, like myself, who work with 35mm film—a gauge typically reserved for commercial use because the infrastructure and expense required in the production and post-production phases. While many avant-garde filmmakers own and/or have access to 16mm portable projectors, not many individuals possess 35mm projectors—and unfortunately, because of the size and weight of the commercial projectors, many of these discarded beauties end up in wrecking yards rather than private homes or gallery/independent spaces. Unfortunately, if there are no 35mm projectors available for exhibition, we will have either to

---

[5] Fujifilm made this announcement in a press release dated September 13, 2012 in which it is suggested that the reason for the decision to "discontinue the sales of negative, positive and some other products of motion picture" was "in order to adapt to the recent rapid transition of digitization in the shooting, producing, projecting and archiving processes of motion pictures" and that "Fujifilm has decided to shift its business operations to provide products and services designed for digital workflow of motion picture production and projection" (Fujifilm Global, "Announcement on Motion Picture Film Business of Fujifilm," http://www.fujifilm.com/news/n120913.html (accessed October 9, 2012).

transfer our films to digital video for screenings, or to stop working with 35mm altogether, neither

which seem like acceptable options. However, as this dissertation will show, in most respects, "the

death of film" as an industrial and/or mass medium, opens the door for artists to re-appropriate this

technology in new and innovative ways.

0.2 Rationale/Research-Creation

Following Marshall McLuhan's theory on the role of the artist in deciphering the meaning of

new media, this dissertation will outline how, through artistic innovation and/or misuse of

standardized practices, the meaning of a medium can be explicated, massaged and maneuvered

through new creative and imaginative engagement. His approach calls into question the

appropriateness of strictly synchronic historical analysis, for he reveals that the production of

meaning is a dynamic, malleable and ever-changing phenomenon that shifts over time and is

informed through a dialectical relationship between past, present, and future. McLuhan's idea of the

artist's relationship to technology has been erroneously thought to pertain specifically to *new* media

on the basis of his preface to *Through the Vanishing Point* where he states:

> The Artist has the power to discern the current environment created by the latest
> technology. Ordinary human instinct causes people to recoil from these new
> environments and to rely on the rear-view mirror as a kind of repeat or *ricorso* of the
> preceding environment, thus insuring total disorientation at all times. It is not that
> there is anything wrong with the old environment, but it simply will not serve as a
> navigational guide to the new one.[6]

It must be emphasized that McLuhan is careful to distinguish *new environments* from *new media*. He

discusses the role of the latest technology on the production of new perspectives but does not limit

the media used by the artists to explore these new spaces to that which is necessarily *new*. Instead,

McLuhan leaves open the possibility for new ways of engaging with old technology, which is the

---

[6] Marshall McLuhan and Harley Parker, *Through the Vanishing Point* (New York: Harper & Row, Publishers Inc.,1968), xxiii.

7

ultimate goal of this dissertation: to discuss the new potential of the film projector at the time of its projected death. This belief in an afterlife of sorts for the artifact is reinforced by McLuhan's own spatial analysis of poetry and painting (which can hardly be considered new media). This, and his time-bending of the meaning of a technology through an interrelated sense of past-present-future is what best defines McLuhan as a media archeologist, a methodology that meshes post-structuralism, phenomenology and historical analysis, and that champions the reconstruction and/or reconceptualization of old media based on new understandings and outlooks. This dissertation serves as an opening for the analysis of this type of technological resurrection for the projector.

As McLuhan explains, the role of the artist is to *imagine* technology and to discern the role of that technology on sensory awareness and on the production of space. While I agree with McLuhan about the role of the artist as a producer of cultural meaning, to my eyes the role of the artist is also inherently political: s/he is charged with making apparent the latent meanings hidden and naturalized within hegemonic ideology that are reinforced by the standardization of technology in cultural practice. The artistically-driven transformation of the technology/technologies of cinema helps to cement the structural paradigms within which the apparatus has historically operated. Because the projector is no longer seen as commercially-viable technology, it can be re-appropriated through the domain of the artist as a "new" medium. As such, I believe that the discussion of celluloid-based film and film technology is not only still relevant, but also perhaps even more pertinent now than at any other point in the history. The results of this media archaeology are important because, by fleshing out the projector, we can see an afterlife for celluloid film as a fine art (a "projected art") relating to performance-based art forms like music, dance and theatre.

My navigational tool through this analysis of the projector and subsequent rehistorization of cinema is the concept of *noise*—perhaps not the first phenomenon you think of when you imagine cinema. But the projector's noises—the unwanted, undesired and insignificant noises produced

through the act of projection—are key to unearthing a history of cinema as an *expressive* rather than *inscriptive* technology and the role of the projector as producer, as a *noise instrument*. As I will illustrate, the projector's noises, both the bodily noises of the instrument itself (the mechanical noise) and the excess noise (the additive noise, both visual and acoustic, that vary depending on the performance), are foundational for the production of cinematic space and the interpretation of *liveness* and *performativity* of the cinematic event. The projector's noises ground the performance of the film. They locate the *moment* of cinema in the *performance* of the film.

This is an ambitious project that relies on an interdisciplinary approach to cinema. My analysis borrows from Cinema Studies, Media Studies, Modernist Studies, Archival Theory, Art History, and Sound Theory. Media archaeology, as a methodology, welcomes interdisciplinary study. Theoretical diversity provides a fertile ground to dig through for the purposes of identifying and reconstructing a socio-technological history. By unearthing the relationship between technology and the ideological conditions through which that technology was defined, and demanding a self-reflexive engagement with that history through the materiality of the technology, I have found media archaeology to be equally congruent with research-creation. Indeed, my own material engagement with the technology as a practicing filmmaker and trained archivist has informed the ideas put forward in this dissertation as much as has historical research. As a practitioner, I have a unique understanding of the material and expertise in avant-garde film processes and an ability to read and imagine the history of cinema through the projector. The way I have imagined the projector's past and envisioned its future is by *thinking through* the technology and listening to its material rhythm.

As part of the research-creation initiative set forth by the Joint Graduate Programme in Communication and Culture at Ryerson and York Universities, this doctoral dissertation is comprised of two parts: a creative artwork and a formal written dissertation. I have included five films with this project that each explore the ideas and theories discussed in the dissertation with

9

respect to the projector's noise: *transparent "c"* (2005), *c: won eyed jail* (2005), *From Catalogs: Wish List* (2006), *A Firefly* (2007), and *ransom notes* (2011).[7] The written portion of this project is divided into two parts: first, a historical analysis of cinema concentrating on the performative and expressive qualities of the medium, and second, an analysis of artistic uses of the projector at three moments of technological transition. The three moments of technological transition include, first, the moment when the avant-garde first embraced cinema technology, looking at the Italian Futurists' use of the Cinématographe and the influence of the projector's noise in the concept of the abstract cinema and the art of noises; second, the moment of the film sound transition, when optical sound-on-film technology was introduced to cinema which gave the projector a voice and the potential to produce synthetic noises; and third, the moment of the digital transition, when D-Cinema replaced the film projector in commercial cinema which has been met with a surge in performative and materialist practices returning to the Futurist concept of the film projector as a noise instrument.

My unique perspective as a practicing filmmaker has informed this research-creation project not only because I have created films to accompany my scholarship, but, through my experiences as a filmmaker, I have engaged with cinema technologies in different and informative ways than many theorists who have not had the same opportunity or access, nor the same material understanding of the artifacts. Certainly, my experience with synthetic noise film and projector performances has informed my material analysis of the artists and artworks I explore in this dissertation. It was through my own practice that I was opened up to the idea of the projector as a noise instrument. My practice as an avant-garde filmmaker has allowed me to approach the media technology of film from outside the frame within which it is generally viewed. I have always been curious about how I can flesh out the technology, how, by paying close attention to its material labour and potential, I could envision new possibilities and potentials that have not yet been realized, but that are embedded in

---

[7] All films can be screened on vimeo at https://vimeo.com/user14541554/videos. Please contact the Yeastes Scook of Graduate Studies for additional ways to view the films.

the materiality of the medium. While writing this document, I spent time experiencing many different projectors, trying to garner what I could through their noises, by listening to their histories and imagined futures. By directly engaging with the technology, I gathered a better understanding of the medium and an enriched idea of how they were experienced.

My research is based on a McLuhan-inspired exploration of the written texts at the root of many historical investigations of cinema, but I explore these texts for an archaeology of cinema through the projector. For my research, I looked at the original manuscripts of Porta, Kircher and Zahn on the camera obscura, the telescope and the magic lantern. These texts are often referred to within histories of cinema, but have been framed within cameracentric ideas because the camera was the focus. Since the history of the projector had not yet been written, this firsthand return to the original sources was the only means to unearth a media archaeology of the projector—previous histories could not see what I was looking for. If I may pull out but one example: Kircher's work on the magic lantern in *Ars magna lucis et umbrae* was particularly illuminating, as I could mark his progress in the development of the medium through the difference in the two different editions of the same book (the first published in 1645 and the second in 1671). I was also able to see links between twentieth century projection techniques and his early experiments in the production of cinematic space (specifically Cinerama but also to projection performances of Bruce McClure which I will discuss in chapter 1 and chapter 4 respectively), which have not, to my knowledge, been addressed by any other scholars.

0.3 Methodology: Media Archaeology

Following Marshall McLuhan's and Siegfried Zielinski's example, this dissertation offers a media archaeology, a methodology that problematizes the ideological and temporal space from which the socio-technological identity of a media is produced and suggests a lateral relationship

between historical processes and emerging practices. Media archaeology, as defined by Erkki

Huhtamo and Jussi Parikka in *Media Archaeology: Approaches, Applications and Implications*, purports that

> [t]he past has been visited for facts that can be exciting in themselves, or revealing for media culture at large, but the nature of these "facts" has often been taken as a given, and their relationship to the observer and the temporal and ideological platform he or she occupies left unproblematized…. Media archaeology rummages textual, visual, and auditory archives as well as collections of artifacts, emphasizing both the discursive and the material manifestations of culture. Its explorations move fluidly between disciplines, although it does not have a permanent home with any of them.[8]

My approach to media archaeology also borrows from more body theory and historical materialist

perspectives to be able to address the materiality of the medium. As such, this dissertation goes

beyond traditional historical research by first situating the investigation of media within specific

historical and sociopolitical moments, and second, by bearing in mind that this understanding of the

sociocultural function of media is temporal and heavily influenced by the lived experience of the

researcher, and third, by asserting that knowledge in general is dialectical.

My focus on the materiality of the media combines McLuhan's position that media is an

extension of the human body with historical materialist approaches to media such as those of

Zielinski, Benjamin, Parikka and Huhtamo. Like McLuhan, I conceive of media as a historical site

for the analysis of spatial and temporal perspectives, and examine the progressive relationship

between emerging media in reconstructing our vision of the past (and vice versa). I deviate from him

insofar as I am directed as much by the larger social body's relationship to media as to the

individual's perception, and by the dialectical malleability of the medium's function—the materiality

of its labour, as a non-human actor—in relation to its historical materialist context.

From Zielinski's approach to media archaeology, I take the idea that the methodology is as

much a creative practice as a rehistorization. Zielinski's work has been influenced by Foucault's

---

[8] Erkki Huhtamo and Jussi Parikka in *Media Archaelogy: Approaches, Applications and Implications* (Berkeley, California: University of California Press, 2011), 1-3.

work on geneaology, but the former describes the latter's approach as too authoritative. Instead, Zielinski suggests that we look at the "imaginary sum of all possible genealogies of media phenomenon," rather than a heterogeneous approach to historical and/or media exploration, as a means of creating a layered and dense sense of the historical moment. This layered approach to history is what composes "deep time"—a look back through these varying alternative histories that flesh out a more complex story.[9] Often referred to as "poetic," Zielinski's analysis is based on a nonlinear view of media development, embarking on a comparative exploration of the rhythms of technology (and/or historical documentation of extinct technology) within this deep time of media. I have attempted to take this more holistic and layered approach to film history by introducing an archaeology of cinema through the lens of the projector in order to supplement and expand existing histories and mythologies about cinema—not to replace them. Zielinski's poetic approach to media archaeology and interest in deep time are the major influence on my methodological practices, even though Kittler may be better known at this time in North America.

While Kittler's approach to socio-technological discourse networks offers insightful revelations about the historical materiality of media, his approach to cinema specifically and media archaeology in general are much more grounded in psychoanalytic discourse than Zielinski's.[10] And, while Kittler's ideas on the interdynamics of voice, identity and technologies of reproduction represent the gramophone and cinematic apparatus through what could be easily construed as

---

[9] David Senior, "Interview with Siegfried Zielinski," Rhizome.org, entry posted April 6, 2006, http://rhizome.org/discuss/view/20967/ (accessed October 9, 2012).

[10] I am intrigued and inspired by the interconnectivity between psychoanalysis and cinema, but in many ways, I view Kittler's approach to be somewhat of a trap. Although I am generalizing, from his psychoanalytic perspective of media archaeology, Kittler easily finds the genesis of all media from within the productions of war, and too readily dismisses all other genealogies as romanticizing art. That said, the early twentieth-century avant-garde cinema practices were very much interwoven with the development of psychoanalysis, and, as such, the socio-historical identity of the medium is related to that theoretical practice. But that does not mean that all socio-technological readings of cinema should or need to be done through the lens of psychoanalysis—it is part of the history of cinema, not the absolute paradigm from which all cinema discourse evolve.

"noisy," my approach, throughout this dissertation, has been more grounded in the use and experience of the acoustic and/or visual phenomenon of noise, purposely created by avant-garde filmmakers, as a perceptual product and/or material manifestation of dialectical tension. In other words, what I intend to show is that if ideology produces a managing set of values and beliefs, and/or of goals, expectations and practices that stitch a society together and naturalizes any inequality produced within that governing paradigm, noise appears at the seams. As such, my approach to noise is necessarily at odds with Kittler's insofar as I am interested in how that which has been understood as disruptive to transmission can actually inform us about the nature of the apparatus, and in how it has been applied to the productive creation of not only new art works, and potential forms of art, but also to new ways to frame that media technology.

0.3.1 Reconstruction

Because much of the history of cinema is told from the perspective of the camera, this project required a considerable amount of historical reconstruction. Reconstruction, as a theoretical device—or, given my personal experience in the world of film preservation, as a material tool—can be a dangerous operation. A media archaeologist must be aware of not only the ideological conditions from which a technology emerged, but also how the researcher's current reality has molded their image of the past. This can be a productive exercise, as previously mentioned, in reconceptualizing old technology through the lens of emerging media practices, but also a destructive tool for erasing the material trace of the past. As such, all reconstruction must be self-reflexive.

My approach is informed by my training as a film archivist. In film preservation, reconstruction has a very practical and pragmatic function: to reconstruct a film into a desired version, typically its original material form (replacing censored scenes, in some case reassembling the

original ending, changing title cards back to their original language and font, etc). For these acts of

physical and historical change, there are rules and guidelines that the preservationist must follow. As

outlined by Paolo Cherchi Usai, current Curator of the Motion Picture Department at George

Eastman House, "any decision taken in the preservation process must: a) be reversible, b) prevent

further deterioration or alteration of the original artifact, and c) be carefully documented."[11] These

same rules should apply to any academic or historical reconstruction. Arguably, the purpose of

media archaeology is to *engender a state of reversibility* to the systemization of infallible "historical facts."

Furthermore, through its discursive approach to history, the goal of media archaeology is to

"prevent further deterioration of the original artifact" by means of avoiding the erroneous idea of

absolute factual authority. Just as a story has more than one side, so too does a history. To assume

that a single accounting for a historical moment is factual is dangerous; alternative theories and

reconstructions offer instructive information about a past (in viewing the past as this original

artifact). Finally, in adhering to the last rule of reconstruction, I have tried to clearly document my

sources and highlight historical shifts that my research is performing. The job of the archivist and

the historian to explain and preserve historical truths can be hindered by the lack of tangible

evidence regarding the objects themselves. However, the job of the media archeologist of retracing

and/or reproducing a history based on the fragmentary evidence that may challenge the prescribed

perspective of archivists and historians finds authority through this very sort of creative

reconstruction—a connecting of the dots, if you will, through lateral thinking. For the media

archaeologist, history is discursive, and there is merit in the performative act of looking back and

imagining forward.

---

[11] Paolo Cherchi Usai, *Silent Cinema: An Introduction* (London, England: British Film Institute, 2000 reprint 2010), 67.

0.3.2 Imaginary Media/Lost Media

For this project, because many of the technologies and/or artworks no longer "exist," they required some kind of reconstruction. This reconstruction took the shape of an intellectual exercise, informed by historical documentation and, in most cases, the practical knowledge of the materiality of technology and/or artwork. Because this project deals with some lost artworks, it also very much depended on *imagined* artifacts. I have not attempted to *recreate* these now lost technologies or artworks (i.e. physically remake the original object) but, in the case of the lost films of Arnaldo Ginna and Bruno Corra, have collected samples of similar artifacts as possible models of the lost material. Instead, by going back to the original description of the lost films, I have tried to provide my readers with written descriptions that will allow them to actively *imagine* the experience of the films.

The concept of the imaginary in the analysis and/or creation of media is complex. While McLuhan believed that the artist *imagined* the use and/or functionality of media, in recent media archaeology, *imaginary media* has become a category of socio-technology, specifically referring to media with distinct properties that distinguish themselves from other media but that have no fixed location in time and/or may not be (or have been) "physically present to the senses."[12] Peter Blegvad, a key artist involved with the Imaginary Media Project connected to the 2004 mini-festival of "An Archaeology of Imaginary Media" in De Balie in the Netherlands, has discussed three types of media based on the relationship between the media and the observer: first, *remembered media*, media that no longer exist, but did and are therefore connected to a specific time; second, *observed media*, media that materially exist and can be observed through perceptual means by the researcher/audience; and third, *imagined media*, which exhibit none of the characteristics of the other

---

[12] These classification of imaginary media were originally created by Peter Blegvad and described by Eric Kluitenberg "On the Archaeology of Imaginary Media," in *Media Archaeology: Approaches, Application and Implications* (Berkeley, California: University of California Press, 2011), 55.

two forms of media, but function instead as a mental idea through which discourse networks can be identified. In the *Book of Imaginary Media*, Zielinski refines Blegvad's criteria by suggesting that there are three kinds of *imaginary media*: first, "untimely media/apparatus/machines," which include "media devised and designed either much too early, realized in technical and media practice with centuries before centuries after being invented"; second "conceptual media/apparatus/machines," which are "artefacts that were only ever sketched as models or drafted as concrete ideas on paper, but never actually built"; and third, "impossible media/apparatus/machines," which are "imaginary media in the true sense, by which I mean hermetic and hermeneutic machines, that is machines that signify something, but where the initial design or sketch makes clear that they cannot actually be built, and whose implied meanings nonetheless have an impact on the factual world of media."[13]

This dissertation deals primarily with the first categorization from both Blegvad and Zielinski's models of imaginary media: artifacts now lost (and which therefore need to be remembered) because they were created too early in the socio-technological history of the media. Specifically, little information and/or documentation has survived on the abstract films of Arnaldo Ginna and Bruno Corra (explored in chapter 2) or the synthetic noise films of László Moholy-Nagy (explored in chapter 3). Very little information exists explaining how they were perceived by their audiences as objects and/or as performed experiences. However, we know they did exist from textual documentation. While the films are bound to a particular historical moment, and thus could be considered *remembered media*, they live outside of cultural memory as physical objects and have taken on the properties of mythology. By this I mean that the films themselves are not *remembered* as experienced or observed phenomena, but *the idea of the films* (as *having existed)* is what is perpetuated through discourse. Even though the films may have existed (and some contemporary filmmakers

---

[13] Zielinski, *Book of Imaginary Media*, cited by Eric Kluitenberg in "On the Archaeology of Imaginary Media," *Media Archaeology: Approaches, Application and Implications*, ed. Erkki Huhtamo and Jussi Parikka (Berkeley, California: University of California Press, 2011), 56.

question the actual existence of Moholy-Nagy's synthetic noise films), they also operate along the lines of Zielinski's "conceptual media/apparatus/machines"—as sketches or models that predicted a new way of thinking about a technology, specific to a time period, that was not fully explored or accepted at that time. For these films, I have attempted a reconstruction through words and by providing an idea of the films by pointing to other observable artifacts created by the same artists that hint towards potential visual or aural repetitions, styles and thematics, thereby allowing my reader to *imagine* what the original artworks may have looked or sounded like. The idea of the lost films is sufficient for the discussion of their socio-technological implications.

While other technologies and/or artworks may still exist in a material form, they are hard to access because of location, the financial means of the author, and their delicate physical condition. For example, Fischinger's films are protected within an archive in California, while Arnaldo Ginna and Bruno Corra's work and writing is stored at the Vatican in Rome. Unfortunately, I did not have the means to visit these locations to analyze the physical artworks. Language was another barrier for the exploration of the Futurists work because very little is written in English on their pursuit of cinema or on Ginna and Corra. Much of Lista's work on Futurist cinema has been translated into French. Although I was able to find some of the original manifestoes of Ginna and Corra, the texts were in Italian, and their nuanced use of the language surpassed my translation skills. I suffered a similar fate when looking at the original texts of Giambattista della Porta, Athanasius Kircher and Johannes Zahn, which were written in Latin. I had to rely on translations as well as illustrations to supplement the information already disseminated in other the books.

For some of these technologies, like Luigi Russolo's *intonarumori* which were destroyed during World War II, there remains clear documentation (photographs, recordings, patents, written descriptions, physical recreations, etc.) to guide my reconstruction of their relationship to the projector's noises. Similarly, while access to the historical projectors is limited, I was able, through

the generous help of Todd Gustavson, Curator of Technology at George Eastman House, to record the sound of many different kinds of early film projectors, to help conceptualize how the projector's acoustic noises shifted over time and through technological innovation, in order to nurture, with material examples, the *imagined* historical experience of these apparatuses. A copy of some of these audio recoding is included with this dissertation.

0.4 Structure

This dissertation follows a four chapter structure, divided into two separate parts: the first part (chapter 1) looks at an alternative history of cinema through the projector; and the second part (chapters 2, 3 and 4) analyze specific moments in the history of the projector and the creative uses of the projector's noises. This written document is accompanied by five films (which I produced while researching this topic) and one audio recording (which demonstrates some of the projector noises that are not normally accessible to my readers).

My Introduction serves as a roadmap to outline the basic ideas and principles that guide my argument, introduces the concepts to be discussed throughout this dissertation, and works to situate my argument within cinema and media studies discourse. Chapter 1 looks at how pre-cinema models of the projector (as an expressive technology) engendered the idea of cinematic space prior to the development of inscriptive technology. Chapter 1 also reconstructs an alternative history of cinema based on the projector in order to reconcile an important and missing socio-technological component of cinema studies, using the founding myth of cinema (the Lumière brothers' first public screening) as a means to ground my investigation. Within this context, I will illuminate the relationship of the projector's noises and the historical culture of cinema, looking at how the projector's noises have been construed as disruptive and dangerous, stimulating its expulsion from the theatre and displacement from the audience.

The second part of my dissertation looks at specific artists and artworks that have pushed the idea of the projector beyond its normative uses at times of technological transition. Chapter 2 looks at the first use of the projector, specifically the Cinématographe as a noise instrument and the Futurists' conception of cinema as performative. Chapter 3 extends this analysis of the *performativity* of cinema after the sequestering of the projector and the invention of sound-on-film technology by examining how the projector's noises allowed for animated sound and flicker film (including my own creative practice). Chapter 4 looks at how, in the wake of D-Cinema (commercial digital cinema projection), the avant-garde has returned to the performative aspects of cinema first explored by the Futurists by using the film projector as a noise instrument in live performances. These three analytic chapters serve to flesh out my thesis on the projector's noises by examining how the technology was appropriated by the avant-garde to produce specific and desired effects beyond the normal paradigm of the cinematic from the 1910s to the present.

My conclusion reminds the reader of my general argument and what has been accomplished through this text. My focus on the projector's noises at these transitional moments fosters a line of inquiry into the medium of cinema hitherto neglected by film/media studies, allowing for a materialist reading of cinema based on the essential acoustic signifiers embedded within the medium itself.

0.5 Definitions

Before delving into my argument, I must define a few key terms that I use in a specific way throughout this dissertation. While I expand on these definitions throughout the body of this document, this section serves to explain my basic terminology and explicate the genealogy of the terms.

0.5.1 Apparatus/Instrument/Device/Machine

This dissertation focuses on the projector and specifically the idea of the projector as an *instrument* in the production of cinematic space and as an active labourer in the cinematic apparatus. To consider the projector as an instrument serves to promote the *liveness* and *performativity* of the cinematic event through the idea of the projector as playing and producing the projected content in real-time, as a musical instrument would play and produce the music previously inscribed in the musical score.

My use of the term apparatus follows in the footsteps of Jean-Louis Baudry's and Teresa de Lauretis although it also expands on their ideas of the exhibition of the expressive nature of cinema being located within the visual space of the screen. Baudry takes the idea of the apparatus from Louis Althusser and applies it to cinema: the cinematic apparatus refers to the complex system which organizes and structure the production, distribution, exhibition of cinema but also manage our idea and experience of cinema. While cinema can be seen as a transformative apparatus, for Baudry, the audience is "cut off from the raw material ('objective reality')" and from the "*work* which has as its result a finished product" and, therefore, from the knowledge effect of the apparatus itself.[14] Baudry, however, is not referring to the work of the projector or the *performativity* of film, but instead to the political economy through which cinema is produced and to what he understands as a psychoanalytic relationship between the audience and the screen content. Baudry's notion of the cinematic apparatus does not account for a materialist reading and/or experience of the act of projection; nor does his concept of projection extend beyond the screen space of cinema (although he does acknowledge that the projector and the theatre are part of the mechanical apparatuses of cinema).

---

[14] Jean-Louis Baudry, Ideological Effects of the Basic Cinematographic Apparatus" in *Narrative, Apparatus, Ideology*, ed. Philip Rosen (New York, Columbia University Press, 1986), 287.

In Teresa de Lauretis's definition of the cinematic apparatus (which expands from Baudry by combining Laura Mulvey's ideas of visual pleasure with Baudry's approach to the apparatus) she limits the experience of cinematic space to the relationship of the spectator and the image/imaginary space presented on the screen, while expanding the "space" of the apparatus as a social practice based in the production of meaning. According to de Lauretis,

> cinema has been studied as an apparatus of representation, an image machine developed to construct images or visions of social reality and the spectators' place in it. But insofar as cinema is directly implicated in the production and reproduction of meanings, values, and ideology in *both* sociality and subjectivity, it should be better understood as a signifying practice, a work of semiosis: a work that produces effects of meaning and perception, self-images and subject positions for all those involved, makers and viewers: and thus a semiotic process in which the subject is continually engaged, represented and inscribed in ideology."[15]

As this quote illustrates, de Lauretis avoids addressing the corporeal encounter of the observer within the lived space of the theatre, looking instead at the implications of the projecting one's self within the image-content of the film. For de Lauretis, the significance of the space of the spectator is in relation to the screen-content, where repressive social constructs are produced and reproduced upon the idea/experience of the feminine body.

With regard to the ideological significance of the cinematic apparatus, I argue that the projector's noises help to locate the observer in the live experience of the screening. The observer, when in the physical proximity of the projector and its noises, is positioned within the embodied space of the projection. That lived experience of the projector within a common space has been neutralized over the past century through the concealment of the projector. The concealment of the projector favours the ideal of illusion in cinema. It makes the apparatus invisible in order to engender a state where the screen space is presented as more "real" than the lived experience of watching it, and the idea of being there takes precedence over the feeling of being here. Further, the

---

[15] Teresa De Lauretis, "Imaging" in *Alice Doesn't: Feminism, Semiotics, Cinema* (Bloomington, Indiana: University of Indiana Press, 1984), 37.

potential for imagination (on the part of the audience) is quelled by the dominance of this illusory

quality of narrative cinema insofar as it inhibits the creative potential of imagination by dulling the

analytic sense of the audience in favor of the dominance of the screen. While I disagree with

Baudry's and de Lauretis's basic understanding of the cinematic apparatus (insofar as they both miss

the lived experience of the body by placing an exaggerated importance on the narrative within the

film and the psychoanalytic connection between the self and the literal projection), I do agree that

cinematic apparatus is at once material, social and ideological. The encounter between the projector

and the body is located within this discursive space.[16] My use of the term apparatus throughout this

dissertation refers to this larger definition of all the elements of cinema as assembled within this

material, social and ideological apparatus.

By contrast, my use of the term instrument refers to a specific tool or implement that is used

for the productive creation of something else. I use the term instrument to draw on its cultural

heritage in music—referring to the idea of a musical instrument as an object that is used to produce

an acoustic phenomenon—but to expand on this to incorporate the idea of the instrument as socio-

technological, as transformative and as a material object through which we can *imagine* and/or

generate another cultural object. To frame the projector as an instrument allows for a new way for

thinking about the projector outside of its function as the cinematic apparatus, as the means through

which the filmstrip is amplified and projected on the screen, that is, as a technology of mechanical

---

[16] There is also a growing body of research in cinema and media studies, sometimes under the term
"non-theatrical" film and media study, which examines cinema within a wider discursive space that includes
the multiple uses of cinema outside conventional theatrical exhibition, distribution, and production industrial
contexts. This research, which includes artisanal and avant-garde cinema practices, further questions the
presumptions about the power of cinematic illusion in theorists like Baudry and de Lauretis. For further
reference please see Haidee Wasson and Charles Acland's edited anthology *Useful Cinema* ((Durham, North
Carolina: Duke University Press, 2011);Wasson and Lee Grieveson edited anthology *Inventing Film Studies*
(Durham, North Carolina: Duke University Press, 2008); Devin Orgeron, Marsha Orgeron and Dan Streible's
edited anthology *Learning with the Lights off: Educational Film in the United States* (New York: Oxford University
Press, 2012); Richard Maltby, Melvyn Stokes and Robert C. Allen's edited anthology *Going to the Movies:
Hollywood and the Social Experience of Cinema* (Exeter: University of Exeter Press, 2007); and Ina Rae Hark's
edited anthology *Exhibition, The Film Reader* (New York: Routledge, 2002).

reproduction that transmits and amplifies rather than produces. To conceive of the projector as an instrument is a nuanced and difficult move. While I agree in principle with Adorno that expressive technologies of mechanical reproduction like the gramophone, the phonograph and the projector (although he only names the first two) separate the audience from the actively engaging with both the work and the act of interpretation (i.e., the production and meaning), I do see the potential for the use of these technologies for productive creation, in other words, for the production of new and original artworks, synthetic phenomena and sensory experiences, specifically through exploring the creative potential of their noises. In jest, Adorno states that:

> There is only one point at which the gramophone interferes with both the works and the interpretation [of the musical piece]. This occurs when the mechanical spring wears out. At this point the sound droops in chaotic weakness and the music bleakly plays itself out. Only when gramophone reproduction breaks down are its objects transformed.[17]

This production of distortion that Adorno is describing is an example of exactly what I am suggesting allows us to conceive of the projector as an instrument. My idea of the projector as an instrument follows in and expands upon László Moholy-Nagy's idea of the transgressive uses of the phonograph, and later the projector, for the production of new synthetic sounds and potentially, a new language based on the material and graphic "scripts" read through these technology of reproduction. I discuss Moholy-Nagy's ideas about the phonograph and the projector-as-noise-instruments in greater detail in chapter 3, but the productive and interpretive qualities that Adorno expresses about the nature of a musical instrument certainly have guided my definition of "instrument" in general.

Occasionally, in this dissertation, I will refer to "devices" and/or "machines." I use the word device to signify things made or adapted for a particular purpose that are not necessarily machines, or mechanical. A device is a tool, but a tool is not necessarily a machine. A machine must be

---

[17] Theodor W. Adorno, "The Curves of the Needle" in *Essays on Music*, ed. Richard Leppert, trans. Thomas Levin (Berkeley, California: University of California Press, 2002), 275.

mechanically built, consisting of different parts, for a particular purpose. Of course the designated purposes of both devices and machines can be transformed or corrupted. Both a device and a machine can be used to transform space, and thus could be considered transformative, but this power is not automatically embedded within the things themselves. Rather, this power resides in how they are used as instruments and/or as part of a larger ruling apparatus. In this sense, a projector could be understood as a machine—as a mechanical object composed of many different, moving, interrelated parts specifically made to project—but also as an instrument—an object that can be manipulated to produce new and original phenomena for artistic purposes—and as part of a larger ideological apparatus that involves the cultural definition of cinema. My interest, however, is in how artists have used the *projector as an instrument*, as a noise instrument specifically, within their creative practice, and why these artists came to use the projector outside of its designated socio-technological intention.

0.5.2 Performativity/Liveness

Throughout this dissertation, I use the terms *liveness* and *performativity* to describe and designate my idea of a projector-centric experience of cinema. In media studies, the term *liveness* has most notably been used to define and illustrate how the mediated experience, produced by and/or through technologies of mass communication, is understood as a social phenomenon. As such, the ideology of *liveness* focuses on the socio-technological aspects of a mediated culture that, in the work of Philip Auslander, Jean Baudrillard, and Fredric Jameson, has been related through a dialectical relationship between the real-time event and its representation and/or reproduction, reality and the simulation. The idea of *liveness*, in this sense, can be seen as an extension of the earlier ideas on technologies of reproduction explored by the Frankfurt school, most notably (although by no means

correspondingly) in the work of Walter Benjamin and Theodor Adorno, as a descriptive quality of something that *happens* and is experienced *simultaneously* in real-time.

On the other hand, the concept of *performativity* is grounded in linguistics and literary studies, wherein the idea has been mobilized to describe the deliberate action resulting from particular utterances and/or speech acts. This discourse has been recently popularized by Judith Butler's work on gender acts and identity (which does not fit into the spectrum of my discussion), but is historically rooted in the origins of speech acts theory and the work of John Langshaw Austin. For Austin, language could be performative, insofar as the certain performative utterances do not simply passively describe a reality—but through the act of saying and/or performing, the utterance engenders change. This idea of *performativity* inspired further discourse in post-structural theory, specifically the later work of Julia Kristeva and Jacques Derrida on meaning and language. In the most rudimentary terms, whereas *liveness* has been tied to mass communication, the machine, and to the socio-technological, *performativity* has tied to interpersonal communication, language and to the development of identity. Both, however, are relevant to my discussion of the projector. My understanding and use of *liveness* and *performativity* is not without these historical ties; however, I am not fully comfortable within either paradigm.

The experience of *liveness*, as a mediated experience, is not typically assigned to cinema, but then again the role of the projector is rarely looked at in the *production* of the cinema event or in the lived experience of the audience within the physical environment of the film presentation such as the embodied space of the theatre. Philip Auslander, taking his cue from Jean Baudrillard's approach to the idea of mediatization as an ideological tool through which all discourses are brought under the dominance of a single code, proposes that *liveness* has been construed as a means for organizing socio-technological mass media practices through the binary ontology of "authenticity" which has dominated the mediated experience of specifically recorded texts throughout the twentieth century.

Liveness, as defined by Philip Auslander, is a social value given to an experience based on the material engagement with a temporal idea. Within the discourse on *liveness*, the object of analysis leans towards a few specific media that mediate our experiences—the popular music recording industry and television—using the performative aspects of theatre and the musical concert at on end of the axis, and the reproduced representation such as film and sound recording at the other. This framing of *liveness* within our mediatized environment operates within the binary of "live" (as in the production of something in real time with the potential of interruption) and "recorded" (as in the reproduction and representation of something recorded from a past moment). Auslander suggests that within this binary, *liveness* has been misconstrued so as to privilege the live event as "real" and the "mediatized events [as] secondary and somehow artificial reproduction of the real."[18] Auslander argues that television has been considered *live* because the transmission has the potential to be interrupted at any point in time for a live news item or emergency message, while cinema has been considered recorded because it shelters the observer from the real time of the outside world. This view does not take into consideration for example the liveness of the projector's performance in the production of cinematic space or even that the filmstrip could break and the transmission could be interrupted, and concentrates too much on the relationship between the audience and the screen content rather than the technology itself, the *performativity* of cinema and the live performance of the projector within the cinematic apparatus. The liveness of the cinematic event, in this sense, is dependent on an understanding of the projector.

The view of film as a reproduction and/or representation is brought about by focusing the analysis of cinema on screen space—on the inscribed and reproduced content shown on the screen—rather than on the act of projection and the lived experience of the audience. The screen space is inhabited by the recorded text, which, although presented in the lived environment of the

---

[18] Philip Auslander, *Liveness: Performance in a Mediatized Culture*, Second Edition (1999; repr. New York: Routledge, 2008), 3.

audience, is indicative of a past moment and an elsewhere place. By looking at the projector, our attention is turned away from the screen and towards the live performance the projector offer, as well as towards the theatrical environment and the lived experience of the audience within that environment. While the film re-presents a past moment, the projector *performs* in the present. In this sense, the projector can be understood as a time machine—as the thing which brings that past into the present, but also as the thing through which time is measured.

While I do refer to the ideas of Adorno and Benjamin throughout this paper, it should be clear that my definition of cinema, and the cinematic texts that I am looking at, stands apart from the dominant tradition in North American and European culture, which happens also to be the tradition Adorno and Benjamin analyzed in their theories of film and/or of mechanical reproduction. I would concur that the consumption of Hollywood cinema, and screen-based cinematic practices where the lived experiences and bodies of the audience are suppressed in favour of the apparition on the screen, engender exactly what Benjamin warns against: "self-alienation has reached the point where it can experience its own annihilation as a supreme aesthetic pleasure."[19] The cinema, if considered a medium solely directed at the production of visual pleasure, certainly demands the kind of critique the Frankfurt School and others have offered. Yet what I think it is crucial to realize that what Benjamin misses in his approach and what my examination of the avant-garde's alternative use of the medium offers is an understanding of the power of *engagement* and *production* that the audience has in creating cinematic space when we consider cinema as a performative and/or projected art. Neither Benjamin nor Adorno would criticize the audience of a live orchestral concert for being too passive and compliant. On the surface, I am inclined to agree with Benjamin and Adorno that the fantasy provided through entertainment media is a dangerous

---

[19] Walter Benjamin, "The Work of Art in the Age of Its Technological Reproducibility: Second Version," in *The Work of Art in the Age of Its Technological Reproducibility and Other Writings on Media*, ed. Michael William Jennings, Brigid Doherty and Thomas Y. Levin (Cambridge, Massachusetts: Harvard University Press, 2008), 42.

suppressant. However, this is not the fault or material result of the technology, but the *way it has been used.* This is why my analysis is less interested with the standardized practices of mainstream cinema, and with their muting of the projector's noises, but in the *performative space of cinema* as realized in a practice where the goal of the experience is not necessarily weighted in favour of the story or screen space. I am looking at the seams, at the places were the projector's noises seep through and film the lived environment of the audience, and at the productive uses of these projector noises by the avant-garde, and this, I argue, lets us see things that can be taken back to an understanding of what mainstream cinema both does and does not do, to enrichen theory of mainstream film. The full development of these insights falls outside of the scope of this dissertation, however, but remains to be explored in future projects.

By looking away from the screen and turning towards the projector we are confronted with the *performativity* of cinema by witnessing the projector-as-instrument *play* the filmstrip in real time. I first encountered this definition of cinema as a live performance in Hollis Frampton's piece, "A Lecture," where Frampton offers an idea of cinema based not on the screen content itself, but on the action of the projector. Frampton suggests that "a film is anything that may be put into a projector that will modulate the emerging beam of light."[20] Throughout "A Lecture," Frampton directs the projectionist to create "different films" by sticking different non-film objects into the gate (like a pipe cleaner), placing filters in front of the lens (a red filter specifically) and observing the difference between a black screen (which he refers to as the absence of content) and a white screen (pure content overload). Through this performance, Frampton draws attention to the projector as the key instrument for the production of cinema and away from the role of the filmstrip (which has traditional been attributed as the basis for the screen content).

---

[20] Hollis Frampton, "A Lecture," in *On the Camera Arts and Consecutive Matters: The Writings of Hollis Frampton*, ed. Bruce Jenkins (Cambridge, Massachusetts: The MIT Press, 2009), 127.

But my idea of *liveness* goes beyond Frampton's view of the projector as generating the image of a film in real-time and/or the basic idea of the live performance of the projector. As previously alluded to, my concept of the projector as an instrument draws a parallel between the experience of a film and the experience of live music. The projector, I argue, can be considered like a musical instrument. The projector can be *played* in order to produce new auditory and visual phenomena. And this performative function must be considered within the analysis of cinema. *Performativity*, for me, has taken on a nuanced relationship with technologies of reproduction, as a subversive means of displacing socially sanctioned ideas about the ontology of a media. I first came to the idea of the projector as an instrument when reading Helen Cixous's "Coming to Writing." In "Coming to Writing," while describing the *performativity* of the written text, Cixous provokes what for me was a game-changing scenario: the *active* role of (what she refers to as) the reader in *producing* the work of art. The reader breathes life into the words that are otherwise held in a state of stasis on the page. In this sense, the book and the filmstrip are similar artifacts: the unseen film, left in its can, is also in this static purgatory; the audience and the act of being watched/heard is what gives the film life. The film, however, is mediated through the projector, whereas the book arguably has a direct relationship with the reader (although perhaps mediated by glasses). The projector is the instrument through which the audience can experience and bring meaning to the film. The mood of the audience, how the film is exhibited—where it is positioned in a screening if there are multiple films shown, the time of day, the time of year, the political/cultural setting, etc.—as well as the environment in which the film is screened such as in a gallery setting, a theatre, a classroom, or an apartment, all affect the *performativity* of the film.

Beyond this material *performativity*, by looking at the projector, we can also garner the conceptual *performativity* first proposed by Austin with regard to the *performativity* of words. Austin suggests that language can be performative insofar as it is not only *reflective* of the world, but can

make and/or *produce* the world. Similarly, the projector can be understood as producing the underlying grammar of cinema—a role traditionally given to the filmstrip. The projector produces the "speech acts" of cinema, i.e., the projector performs the language of cinema and the audience then interprets those gestures and articulations. The acts of the projector are performative in the same way that speech acts are performative: they both have the potential of *making, producing* and/or changing the world by putting forth new potentials and new possibilities, and by *imagining* space into being. Austin's ideas on *performativity* were then developed by John R. Searle, Jacques Derrida and Judith Butler, for whom the application of the performative became directly associated with identity politics through an extension of postmodern ideas of the interpretative and the creative act of deconstruction as a new model for the production of meaning. Although I do not spend much time within this framework, I offer that by looking at the projector, cinema is opened to a renewed philosophical and semiotic analysis based on this sense of the performative.

What I am proposing is that the projector's noises and considering the projector as a noise instrument bring to the analysis of cinema a sense of the *liveness* and *performativity* of the cinematic event. Here, it is imperative to understand that the cinematic event is more then the expression of the filmstrip and the consumption of the cinematic text presented in the screen space. Rather, the cinematic event is rooted in the live playing of the filmstrip by the projector (or, as discussed in chapter 4, the physical manipulation of the projector by the performer during the act of projection) and the live *production* of the *experience* of a film.

0.5.3 Screen Space/Lived Environment/Cinematic Space.

While space is a concept that is fleshed out throughout this dissertation particularly with regard to the divergent kinds of specifically illusionary and immersive experiences of space engendered by cinema, I should spend a moment on the nuanced and apparent differences between

screen space, cinematic space, and lived environment. Most analysis in film studies focuses on screen space—on the physical space of the screen and the imagined activity that occurs within that space through the act of projection. The screen space is the home of representational content, and has come to frame cinema as around the thing on the screen (i.e., the moving images) reproduced and distributed on the filmstrip and transmitted through the projector. For the audience in the theatre, the screen space is always (an) elsewhere, an imaginary place that they cannot touch available only through visual and acoustic reproduction.

The screen space, while technically produced by the projector as it projects the filmstrip, is tied to cameracentric approaches to cinema insofar as inscription (the message that has been inscribed on the filmstrip) is privileged over expression (the expression and/or amplification of that inscription).[21] What the audience is seeing and experiencing or is meant to see and experience is the representation of the camera-eye, rather than the *liveness* and *performativity* of the projector. Even in Baudry's theory of the cinematic apparatus, the screen space dominates the projection apparatus— the governing structure between the projector, the screen and the theatre.

Screen space is thought about at least in the work of Metz, Mulvey, Lauretis , Sobchack, etc. as a binary of the lived environment of the audience. Even though referenced within this binary, the lived environment of the audience, as the primary point of analysis is rarely engaged with in film theory (the exceptions being Barbara Klinger's exploration of theatre spaces as a means of socially and physically policing of the body, but the nature of that research does not address the experience of the body). This lived environment interests me insofar it has a tremendous effect on the

---

[21] I am referring, here, to the definition of inscription and expression in cinema that Vivian Sobchack provides in her book, *The Address of the Eye: A Phenomenology of Film Experience*, which does attempt to flesh out the dialectical nature of the cinematic apparatus through the sensory exploration of how the audience perceives a film. Sobchack looks at the camera and the filmstrip as inscriptive technology, and calls for more analysis of the expressive technologies of cinema, like the projector. Unfortunately her own analysis of projection focuses on the screen space, and the audience's relationship to that screen space rather than on the larger cinematic apparatus, or even the projector within the audience's perceptual engagement with a film.

audience's experience of a film: on one level, the stimuli in the physical, lived environment interacts

with and informs the reception of the screen content, but more to my point, the lived environment

is an embodied and acoustic space. The way we think about the lived environment and the bodies of

the audience inform the way we think about cinema in general. I have chosen the term lived

environment to describe the material world of the audience for a few reasons. First, I have chosen to

call that place within which the audience dwells an environment rather than a space as a means of

marking the contrast between a physical edifice and a concept. Environment also refers back to

McLuhan's use of the term, which focus on the relationship between technology, human perception

and production of space (discussed in section 0.2).

Cinematic space is the most complex of these three terms, as the screen space and the lived

environment are both components of this larger object. Cinematic space can be understood as the

material concept of the cinematic apparatus: it is the space that is *produced* through the cinematic

apparatus. Here, I am influenced by Henri Lefebvre's idea of space as a social production, insofar as

I am thinking of cinematic space as a way through which we can flesh out our understanding of our

perceptual relationship with the world. Although Lefebvre himself does not address cinema directly,

his theory of the production of space is well suited not only to cinema as socio-technological

practice, but specifically to my argument about the role of the projector's noises as instrumental in

the production of an immersive experience of cinema. As Yingjin Zhang explains:

> [A]s Lefebvre argues, if "space is a product" then the object of our interest must
> "shift from *things in space* to the actual *production of space*," that is, from space as a fixed
> entity to space as a "productive process" that induces change and is subject to
> revision. Corresponding to what he describes as "three moment of social space" or a
> "triad of the perceived, the conceived and the lived," Lefebvre differentiates three
> critical concepts: "spatial practice (a physical space characterized by a certain
> cohesiveness without necessarily being coherent), "representations of space (a space
> largely dominated by social engineers that tends towards a system of verbal signs,"
> and "representational spaces (a space dominated by artists and writers that tends
> toward a system of nonverbal symbols and signs, which David Harvey prefers to call
> "spaces of representation" linked to "imagination"). Cinema undoubtedly belongs to
> Lefebvre's representational space, because it "has an affective kernel," "embraces the

loci of passion, of action and of lived situations," and "may be directional, situational or relational, because it is essentially qualitative, fluid and dynamic."[22]

Cinematic space is a representational space linked to the imagination, certainly, but I want to be clear that Lefebvre's definition of representational is more in line with the Hegelian idea of art as giving life to the spirit than with the discourse on reproduction and mimesis. However, if we were to identity this Hegelian spirit in Lefebvrian terms, to do so would not be in line with any religious sentiment. Rather the spirit would be linked to deeper meanings, rhythms and productions of spaces. In this sense, Lefebvre's idea of the production of representational space compliments McLuhan's idea of the function of the artist: to imagine interactions and to flesh out meanings. Cinematic space exists within this imaginary opening, where technology, representation and flesh are meet, to speak to the underling rhythms that define our experience in/of the world.

0.5.4 Noise/Music/Sound

This dissertation looks specifically at the projector's *noises*—not music or the musicality of film, not sound in general, and not voice or dialogue in film. The potential relationship between sound and image in film has been considered since the birth of cinema (I will touch on this with regard to Arnaldo Ginna and Bruno Corra's pursuit of colour music through the projector, as well as the importance of noises on the experience of the Lumière's first film screening). As Rick Altman famously stated, cinema was never silent; there was always a music or soundscape attached to the visual images. In "silent cinema" this took the form of a player piano, an orchestra, or, in some early vaudeville, an off-screen performer filling in the voices of the on-screen actors. What has been neglected in the continued study of film sound, a domain that includes research on music, sound

---

[22] Yingjin Zhang, *Cinema, Space, and Polylocality in a Globalizing China* (Honolulu, Hawai'i: University of Hawai'i Press, 2010), 2.

and voice in film, is the role of *noise* within the spatializing and performative function of cinema. This void is something that this dissertation aims to fill.

By tracing the projector's noises we can see the technological development of cinema since its inception and how our understanding of cinema has shifted over time; by focusing on the technology rather than the screen content, we can gain a better understanding of the materiality of cinematic space. As an experiment in media archaeology, this dissertation aims to continue within the discourse that discussed "film" within the context of Siegfried Zielinski's definition of audiovision, which describes media and/or technologies of communication that combine audio and visual signals: the telegraph, the telephone, television, film, etc.). Noise, as a general qualifier, has the privileged ability to describe either visual or audio phenomenon. In film and/or video when the "message" is interrupted, the ensuing disruption in the signal is described as "noise"—the image is *noisy* in video when the digital artifact become visible or when the data is corrupted; in film, when the grain is too apparent on a film print, or the visual field is interrupted by dust, dirt and scratches.

The study of film sound in film has basically been divided into two main categories: first, an aesthetic and formal approach to the study of film music (which includes the work of Kurt London, Sergei Eisenstein, Theodor Adorno and Hans Eisler, and Roy Prendergast), and second, a semiotic analysis of voice and language in film (which includes the work of Christian Metz, Mary Ann Doane, Rick Altman, and Michel Chion). In recent years there has been an interest in the ecology of sound in film, specifically with the research of Steve Goodman, Randolph Jordan and Chion's later research. The first aesthetic approach, looking at film music, considers primarily the interaction between the visual images presented on the screen and the music used to fill out those images. From this approach, the idea of the musicality of film is paramount—the ability to look at film as analogous to a musical text insofar as there are rhythms and counterpoints that emerge through the combination of these two time-based media. The second approach, which considers the "speech"

function embedded in film language, focuses on voice (i.e., the voice of the actors and what they are saying) but also on diegetic sound as an extension of the voice of the screen space. The third approach considers how sound and soundscapes, not just music or voice, are used to flesh out the "lived environment" recorded on the filmstrip and represented in screen content. None of these approaches inherently focus on the experience of the technology, the liveness of the sounds within the lived environment of the theater, and/or the acoustic space of cinema as an expressive art as brought into experience through the analysis of the projector's noises.

As an avant-garde filmmaker and scholar, I have always found these approaches limiting insofar as they have consider "film" as a singular, absolute whole, without necessarily considering the different constraints placed by genre, technology or industry. Further, narrative, commercial film practices fuel their analysis. My research offers to the field of audiovision the importance of *noise* within this history of film sounds. In this dissertation, sound is used in the broadest sense to describe any acoustic phenomenon; music to describe the artistic arrangement of sounds using a system of tonality and harmony that has been proscribed to since the common practice period codified musical composition in the sixteenth century; voice to describe speech and diegetic sound; and noise to describe the unintentional and/or unwanted sounds (mechanical or otherwise) that invade the cinematic experience. However, I will be concentrating on the noise of the projector rather than social noise (e.g., audiences) in the context of avant-garde projector practice.

Much of the literature on noise, from Jacques Attali to Paul Hegarty to Karin Bijterveld, takes a sociopolitical approach to the phenomenon, focusing on its role in defining class boundaries, insofar as *music* is viewed as a privileged category of sound available to the elite, typically in controlled, private spaces that was used, consciously or not, to forcefully block out the boundless *noises* of the streets/masses. Noise, in this sense, is the physical audible object of urbanization and industrialization, the culmination of uncategorized sounds that, heard together, have no inherent

36

significant value, but are understood as a threat to social order. This concept of noise is a modern

phenomenon, a byproduct of mechanization and increased population density within urbanized,

industrialized cites. In this regard, within a small, closed, private space, the projector's noises come

to represent the greater sociocultural transformation in our understanding and experience of space,

similar to the larger urban/industrial shift.

Noise and noises have come to represent a particular kind of sound (unwanted, insignificant,

dangerous, unpleasant, etc.), but as Paul Hegarty points out there is also a distinction between the

two terms:

> Noise is not an objective fact. It occurs in relation to perception—both direct
> (sensory) and according to presumptions made by an individual. These are going to
> vary according to historical, geographical and cultural location. Whether noise is
> happening or not will depend also on the source of what is being called noise—who
> the producer is, when and where, and how it impinges on the perceiver of noise.
> Noise is not the same as noises. Noises are sounds until further qualified (e.g. as
> unpleasant noises, loud noises, and so on), but noise is already that qualification; it is
> already a judgment that noise is occurring. Although noise can occur outside of
> cognition (i.e., without is understanding its purpose, form, source) a judgment is
> made in reaction to it. Noise then is something we are forced to react to, and this
> reaction certainly for humans, is a judgment, even if only physical.[23]

The projector produces what can be understood as noise and as noises. The projector's noises,

specifically, are multiple: there is the mechanical noises of the machine itself (the noises of the gears,

in early models, and the motor, in later models), there are the intentional noises amplified by the

machine (the noise grounded in the optical soundtrack on the film), and there are the unwanted

noises produced through this amplification (the distortion of the soundtrack by material

deterioration of the optical soundtrack, or residue on /in the technology). The projector produces

noises that have been conceived off, in the dominant ideal commercial cinema, as "bad" and as

things to be suppressed.

---

[23] Hegarty, Paul, *Noise/Music* (New York: Continuum, 2007), 3.

The projector has also been considered as noise within the cinematic apparatus: as the thing that is distressing, that we are forced to react against, despite the entertainment value of the projection or of the film itself. Thus, the projector as noise refers to the disruption of representations of space that can occur in the act of projection. If we were to follow the idea that cinema produces an illusory reality through the act of projection, a malfunction of the projector may disrupt the continuity of the illusion. It may create "noise" in the production of cinematic space, through the disruption of the film, but also in rupturing the representation of space (the space of the screen) with representational space (the space of the lived body engaged in the production of space as a spatial practice (the theatre) and the representation of space (the screen). As such, the projector produces both noise and noises.

There have also been attempts within the discourse on noise to address cinema. Douglas Kahn comes closest to an aesthetic of noise by tracing how noise has been taken up by the avant-garde. For Kahn, the central theme in many early twentieth century artistic experiments with noise was to make noise *significant*—to find and express meaning in the abject sounds seemingly cast outside of the traditionally conceived systems of signification. Like Attali, Hegarty and others, Kahn was not suggesting that noise did not historically *mean* prior to this engagement, but argued instead that the practice of intentionally using noise, in a productive means of expression, was born within the avant-garde of the early twentieth century for a bevy of reasons, including a desire to challenge the dominant hierarchy of a stagnant musical order, to explicate the function and performance of new technology on the production of meaning, and to extend the language of this new media into artistic practices and discourses. Kahn's analysis, while often looking at the same examples used in this dissertation, does not consider the active role of the projector in this production of noise— something I view as a tremendous oversight in his part.

To understand the socio-technological history of cinema, looking at the projector's noises is important because it can help to illuminate how the technological development of cinema has impacted the way cinema has been defined and perceived over time and has shifted the idea of cinematic space. In a network system based on communication (of ideas, of images, of sounds), noise indicates anomalies in the codified structure, and points back to the materiality of the system itself. As Jussi Parikka states in "Mapping Noise," "noise becomes a way of understanding how normal communication works."[24] Parikka's analysis is centered on how noise is perceived as a threat to digital communication technology, and how our desire to temper noise should be mitigated against the productive content provided through that noisiness: in Parikka's words "due to its centrality in technical media, noise is an essential part of that 'archive', in the sense that it constitutes a key theme of modern technical media culture. Through noise, through anomalies, we are able to decipher a range of crucial issues concerning politic, aesthetics and cultural processes of media."[25] By focusing on the projector's noises, this dissertation goes beyond a hermeneutics of noise, looking toward new ways of understanding cinema, interpreting embodied cinematic space, and extending the discourse on audiovision[26] in general. Looking toward the projector, listening for what has been considered insignificant and/or unwanted, allows for an understanding of cinema directed away from the canonic literature of film studies, and engaged within the discourse of modern art and modern aesthetics.

To study noise in the archival context of film is especially problematic. Noise is an aesthetic and experiential phenomenon that cannot be accessed through normal duplication and reproduction methods. The film, as a material object, has a lifespan that is reduced every time it is screened. However, the film's meaning and essence can only be appreciated in the performance of the original.

---

[24] Parikka, *What is Media Archaeology* (Malden, Massachusetts: Polity Press, 2012): 110.
[25] Ibid.
[26] Using Zielinski's definition of audiovision, which encompasses technologies of communication that combine audio and visual signals: the telegraph, the telephone, television, film, etc).

How do you preserve a work that can only be appreciated by means of self-annihilation? Or conversely, how do you research an aesthetic experience if you cannot gain access to the original material? The materiality of noise, the importance of direct access to the original object and the original exhibition technology are highlighted by these questions. And, within the shift to digital cinema, these materialist properties are being erased. The negative association of noise indicates another problem for historical research as digital technology continues to provide new and improved ways to "restore" film. The silencing of grain, the reconstruction of missing image content (due to mechanical wear or chemical decomposition), the reduction of flicker and the stabilization of the image frame are all standard practices of basic digital restoration. However, there is aesthetic information contained in this visual noise that is being lost through this restoration.

The same holds true for the audio noise on early sound films. Robert Heiber of Chase Audio and Restoration has suggested that the noisiness heard on many early sound recordings is *generated* by the use of modern technologies. According to Heiber, the material and technological differences (in weight, structure and mechanics) between new and old playback equipment is one of the primary issues in sound film restoration. For example, Vitaphone records, when played on modern record players sound extensively poppy and hissy; this noise interferes with the readability of the original content and extensive digital restoration is typically required to "clean up" the recording. The arm of original Vitaphone players was much heavier than modern record players. If more weight is applied to the Vitaphone record when it is being played back, the noise is significantly reduced. The use of the historical technology, however, is often difficult because, while the media texts are conserved/preserved, the equipment was often not. This all goes to show that the *technology* itself is as important to the study of noise as the noises themselves.

0.6 Conclusion

In the concluding chapter of his book *The Deep Time of the Media*, Zielinski calls for an archaeology of media based on forms of "processual art praxis" rather than the media object as a finished product. For this, he suggest we look towards sound and music, as time-based art forms that have incorporated *performativity* into their lexicon and consider media as audiovisions (i.e., instruments of interrelated acoustic and visual phenomenon). My investigation of the projector's noises falls nicely into Zielinski's paradigm. While I am not as interested, necessarily, in the musicality of film, I am quite convinced that the performative elements and process-based experience of cinema (like that of live music) is paramount to our understanding of film as a projected art. The results of my archaeology are important because, by fleshing out the projector (which has been otherwise been largely neglected when we speak about film and/or cinema), this exercise will help us not only better understand the history from which cinema developed as a projected art, but the afterlife of celluloid-based cinema in the digital age. By focusing on the projector's noises, this dissertation goes beyond a hermeneutics of noise, looking toward new ways of understanding cinema, interpreting embodied cinematic space, and extending the discourse on audiovision in general. Looking toward the projector, listening for what has been considered insignificant and/or unwanted, allows for an understanding of cinema directed away from the canonic literature of film studies as it stands, and engaged within the discourse of modern art and modernist aesthetics.

Chapter 1

A Media Archaeology of Cinema Through the Projector

1.1 Introduction

Performing a media archaeology of the projector allows us to look at the evolution of cinema as a *projected art*. The projector, as I will establish in this chapter, predates the origins of "cinema." Since the projector is the key instrument in the production of cinematic space, the concept of cinematic space could also be thought of as predating what we conventionally understand as cinema. This chapter sets ups the heritage of the projector in order to explicate the unique function of the projector's noises in the production of cinematic space. The projector and its noises, I argue, invoke a sense of the liveness of the performance of film. As such, the projector and its noises point to the lived experience within the theatre and to the embodied space of cinema. As discussed in my introduction, cinematic space is not a physical location and does not refer *only* to the embodied space of the audience in the theatre. As Vivian Sobchack suggests, cinematic space as an embodied space is dialectical; it is produced through the tension between the lived body of the observer and that person's psychological experience of "other" and "elsewhere" through the screen content. What I am primarily concerned with in this chapter is how the historical materiality of the projector and the role of the projector—specifically the projector's noises—contribute to the production of and awareness of cinematic space.[27] This discussion of the bodily relationship to the projector's noises is timely insofar as I wonder if I would have been able to think critically about the film projector's noises if not confronted with the imagined silence of the digital projector.

---

[27] It should be noted that the projector's noises and/or mechanical noises were not and are not the only kinds of there are other types of "noise" present in the exhibition/experience of film. Perhaps the most obvious example of another kind of noise within the theatrical space would the social noises of the audience ("people noise" as opposed to "machine noise"), but also a noisy aesthetic that counters the ideals reinforced by the dominant ideology.

To discuss the origins of the cinema and cinematic space, it is important to go back to the story of its origin, to how it has been imagined within our culture. The grounding moment for this chapter is the story of the first public projected film screening—the site of "cinema's founding myth"[28]—in which the audience, so terrified and confused by what they saw on the screen panicked and fled the theatre in fear of their physical safety. The pervasiveness of this founding myth is supported by the countless theories aimed to explain the myth's existence and/or proposing reasons for why the experience may have been so fearful. Tom Gunning (perhaps the most famous theorist on the "train effect") urges us to look not at the veracity of the myth, but at the historical context from whence it emerged and the ideological soil that nurtured its growth. He suggest the audience's reaction was *performative*, the product of a thrilling sensation—a type of immersion within the moment (of the performance, not of the past recorded moment presented on the screen) common in early cinema of attractions. I agree with Gunning insofar as the physical reaction of the audience of pleasurable terror performed what I would describe as a "call and response" between the audience and the screen content. However, my materialist approach extends beyond Gunning's address by focusing on the labour of the projector in the production of cinematic space and cinematic time.[29] Unlike Gunning, who frames his analysis through the Freudian idea of the uncanny (thereby supporting and nurturing the link between psychoanalysis and film), my approach looks at the socio-technological relationship between the labour of the projector and the experience of the audience. By looking at the production of cinematic space in pre-cinema technologies, we can see that the dominant paradigm of "watching" is not inherent to the medium, and that there is

---

[28] This borrows Martin Loiperdinger's specific terminology for the event, but variations on the wording are used by Tom Gunning and Christian Metz. The founding myth is discussed by Yuri Tsivian in reference to "the train effect."

[29] There is a substantial history on the labour of projectionists, the people who operate projectors, ranging from the itinerant projectionists of early cinema through mobile cinema operators to commercial cinema projectionists (whose labour had radically changed with D-cinema), but in this dissertation, I focus on the labour of the projector, not projection*ists*.

precedence for the projector-as-instrument to take an active role in mediating/transforming the space.

The projector's noises, I argue, are an implicit part of cinematic embodiment, the exploration of which helps to clarify the transition of perception from the isolated observer to the concept of the audience as a social body. In this regard, Adorno and Eisler, in their analysis of film music, inadvertently provide the seeds for my argument. While there is much evidence that the interpretation of the founding myth as frightening is more legend than actuality, Adorno and Eisler suggest that the panic felt by early cinema audiences was caused by their awareness of a political shift from self-identification as active individuals with personal agency to those of suppressed members of powerless proletariat. Adorno and Eislser suggest that it was not the screen content on its own, but the combination of the muted apparitions on the screen with the mechanical noise of the projector that upset the first film audience.[30] The events of cinema's founding myth, to me, are important because they solidify the role of the projector in the cinematic apparatus, and explicitly focus on the *performance* of cinema and the role of the audience inside the cinematic apparatus.

The lived experience of the audience in the theatre, much like the projector itself, has been neglected within our imagination of cinema. By exposing the relationship between these neglected parts, it is possible to reframe our idea of cinema in general, looking at historical usages of the projector in the development of cinematic space. I will set up a new way of envisioning cinema based on *performativity* and *liveness* in chapter 3, 4, and 5, to re-situate the projector and the projector's noises as defining attributes of cinema. The question becomes how do we (re)engage with these neglected elements when they have been purposely made imperceptible? And, does the film projector engender a specific kind of experience of cinematic space, with a specific temporality and materiality, that is changed with digital cinema?

---

[30] Adorno and Eisler, *Composing for the Films* (New York: Continuum, 2007), 48-53.

In considering the production of cinematic space as performative, this chapter breaks away from other cinema histories (constructed by the likes of Jean Mitry, Christian Metz, George Sadoul, C.W. Ceram, *et al*) that have considered the pre-cinema technologies of the camera obscura, telescope and magic lantern as technologies of mechanical reproduction based on the model of the camera, and histories of screen practices (constructed by the likes of Charles Musser and Anne Friedberg) that focus on the screen space and the content presented "on-screen" rather than act of projection itself. Cinema understood from the perspective of the projector centres on the idea of cinema as performative, on an understanding of the *liveness* of each screening, and the idea that each individual performance differs because of the ever-changing atmosphere within the lived space of the theater (i.e., the relationship between audience members, ambient noises, the film's position in a program, the smells, the seating, the time of year, etc.) as well as the material degradation of the apparatus and/or components of the apparatus (i.e., the mechanical integrity of the projector, damage to the emulsion on filmstrip caused by regular wear, the life of the bulb, the luminosity of the screen, etc.). The first part of this chapter sets out to establish that the projected arts had a sociotechnological history before the Lumière Cinématographe, and, as such, will look at the *performative space* of the camera obscura, the telescope, and the magic lantern as precepts for the modern cinematic experience. The second part of this chapter develops my argument that through the projector's noises, the audience gains a conscious understanding of cinema as performative space. I would note that rather than attempt a definitive history of this founding moment of cinema, I am engaging in an exercise to elaborate on how this moment—this myth— can be reimagined by making the projector central.

As such, this chapter starts and ends at the same place: the site of the Lumière brothers' first public film screening in the Salon Indien in Paris on December 28th, 1895. It is important to understand how the projector was *imagined* in order to establish that the dominant conception of

cinema as a technology of reproduction (a thing that reproduces a past event) is not bound to the material apparatus but to an ideology which privileges visuality, liberalism, and progress. The ideological history of cinema is complex: cinema (specifically narrative, commercial cinema) has been accused of proliferating an industrial capitalist agenda by suppressing the proletariat through the promotional propaganda in cinema narratives (like meritocracy, social mobility and the American dream). The practices of pre-cinema technologies, like the magic lantern, have been caught up in this discourse, but are not, as I will show in this chapter, irrevocably bound to it. These (mis)identities have been provided through a historical looking back, but are not (nor need they be considered) "factual" representations. As such, through the analysis of the projector's noises, the live event of cinema, as new and immediate, can be highlighted.

1.2 Cinema's Founding Myth[31]

The date is December 28, 1895. You are standing on Boulevard des Capucines in Paris, France—a street filled with the scents, sights and noises of an energized, restless, urban metropolis. It's a Saturday night, and even though close to the Christmas holiday, the streets are crowded. You enter the Grand Café—a magnificent building, and "descend some rather steep and unpleasant stairs"[32] to reach the Salon Indien (formerly a billiards parlor, recently transformed into what would be known as the first movie theatre by the Lumière brothers). You enter the Salon Indien through a turnstile installed in the slim doorway, perhaps passing a single security guard (but perhaps not, since this was the first screening and security may have only been required at a later date).

---

[31] My reenactment of the myth (not the historical event necessarily) provided here was created by piecing together various accounts of the first public motion picture screening, including those examined by Tom Gunning, Martin Loiperdinger and Laurent Mannoni, David Shipman and the historical documentation provided by the *Institut Lumière*. As such, it should be considered an exercise in historical imagination rather than an attempt at a definitive history, in the spirit of the reconstructions essayed in chapters 2 and 3.

[32] Ludwig Stollwerk in letter to John Volkman, April 16, 1896. Quoted in Martin Loiperdinger, "Lumière's Arrival of the Train: Cinema's Founding Myth," *The Moving Image* 4, no. 1, (Spring 2004): 95.

Lush curtains drape the walls and ornate carpets cover the floor of the Salon Indien. The room itself is measures about 40 by 25 feet. Yet the place feels cramped—aisle after aisle of rickety chairs fill the space (see figure 1.1). You hear someone say that there were 180 seats—you don't believe it. Not in a room that size. Maybe one hundred. Regardless, there were far too many chairs for the mere 33 people that made up the audience that night. You mumble about this as you try to access a seat. Towards the front of the room, a magic lantern has been set up. There appears to be some kind of mechanical attachment in front of it. You are underwhelmed…you were hoping for something more. You came because you were intrigued by the claims of the Lumière brothers. They said that they had created a spectacular new technology for living photographs. (Now, you must remember that you have seen living pictures before. You are a cultured person. You've been to a multitude of different phenakistoscope and phantasmagoria shows. Back in April 1894, you had lined up for your chance to be one of the first to watch a film through Edison's Kinetoscope, at the first Kinetoscope parlour in New York City). But, the Lumière Brothers blood ran thick with photography. Surely they wouldn't disappoint. So, with a sigh, you try to remain cautiously optimistic.

The lights go out. Louis Lumière stands at the illuminated lantern. You see the outline of a black and white photograph fill the white canvas screen. The projection is about seven feet by nine feet; the image is still. On the screen, you see the projection of some people gathered around the platform of a train station, presumably waiting for a train, which you faintly see in the distance. Nothing dazzling. You hear someone exclaim, "They got us all stirred up for projections like this? I've been doing them for over ten years."[33] You recognize the voice. It's George Méliès. You, begrudgingly, have to agree with him. This is not spectacular. You had seen variations of this at every magic lantern screening in Paris over the past few decades—including Méliès magic acts. You turn to look at Louis. With his right arm, he slowly starts to crank the apparatus in front of the magic lantern. You hear a noise emanating from the machine: a noise of mechanical movement, of internal gears and winding chains. A slow "kaaaaaaaahhhh-chhhhhhiiii-kaaaaaaaahhhh-chhhhhhiiiii-kaaaaaaaahhhh-chhhhhhiiiii" at first, but as Lumière cranks faster, a higher pitch

---

[33] George Méliès as quoted in Tom Gunning, "An Aesthetic of Astonishment: Early Film and the Incredulous Spectator," in *Viewing Positions: Ways of Seeing Film*, ed. Linda Williams (New Brunswick, New Jersey: Rutgers University Press, 1995), 119.

and fluent "kah-chi-kac-chi-kah-chi-kah-chi-kac-chi-kah-chi-kah-chi-kac-chi-kah-chi." It reminds you of the sound of

a train – but higher and softer. You turn back to the screen. The people are moving! The train, it's coming closer,

moving into the frame. Wait, will it stop? The train rushes forward, to the sound of the "kaaaaaaaahhhh-chhhhhhiiii-

kaaaaaaaahhhh-chhhhhhiiiii-kaaaaaaaahhhh-chhhhhhiiiii" of the Lumière's optical lantern. A woman screams,

"It's coming straight at us! It's not going to stop!" Indeed, the train is headed right towards you, it started in the right

of the screen, and is speeding, on a diagonal, to the left side, right through the frame, as if the train would fly off the

screen and into the theatre. "Get me out of here!" you hear someone cry. From different areas of the theatre you hear

screaming, shrieking, gasping, and the occasional decree: "The train, the train!!!" People are fleeing for the exit. Chairs

are being tossed. A woman has fallen to the ground. People are tripping over her in a rush to get to the door, that

small entrance way obstructed by that turnstile. You join the mass, perhaps not out of fear of the train but out of fear

of being run over by the panicked mob. Push. Pull. Slap, Crunch. People are jumping over the turnstile, pushing others

out of the way. Someone has fallen down the stairs. You here a voice trying to settle the crowd, "Stop! It's not real!"

You turn to look at the screen, at the theatre, but all you see is "mob." You are trapped, squished up next to the

doorway, as people continue to fight to leave the room. This is like nothing you have ever seen before!

You have just witnessed the first public screening of a projected motion picture. And after the terror settles, the

Lumière brothers have a hit. Everyone wanted to see these living images, to be thrilled by the train, to be witness the

power of technology!

This short account describes the events of the first projected film screening, as they have

been imagined and reimagined in cinema's founding myth. The myth highlights important material

aspects pertinent to my specific exploration of cinema: the role of the projector in the production of

motion picture, the impact of the projector's noises on the production of cinematic space, the

liveness of the performance of film, when considering the projector-as-instrument. As the research

of Yuri Tsivian (1993), Tom Gunning (1994), Stephen Bottomore (1999) and Martin Loiperdinger

(2004) suggests, the authenticity of this myth is questionable at best, but this myth showcases how

the birth of cinema has been represented. Whether or not the myth is "true" is irrelevant to my

exploration,[34] because what this myth provides is an image of the lived bodies of the observers, the

lived body of the audience, as an integral part of the cinematic apparatus. The myth establishes that

cinema takes place in a space, and that space is made up of material and immaterial objects: on one

hand, the room, the chairs, the projector, the screen, the bodies of the audience, and on the other,

the projected image, the experience of time, the presence of a past and other space through the

screen content, the psychology of spectatorship and sound. This cinematic space is *embodied*. My

analysis differs from previous scholars insofar as, for me one of the central issues made visible by

the myth is that *performativity* and embodiment are situated at the forefront of the cinematic

experience, and that these aspects of cinema are brought into focus by looking at the labour of the

projector in the production of cinematic space.

1.3 Illusion, Immersion and Embodied Cinematic Space

Cinema's founding myth serves to edify the idea of cinema as a powerful illusionary medium.

The myth is built on the idea that upon the sight of the first projected moving photography, the

audience fled in terror—the screen content was so believable, so real, that the audience thought the

train would actually jump off the screen and potentially harm them. While the concept of the

audience is highlighted, this founding myth inherently (and mistakenly) frames the first film audience

as entirely naïve of the representation of photographic motion picture, and, in the words of Tom

Gunning, as:

---

[34] Loiperdinger specifically gives the most damning empirical evidence that cinema's founding myth likely did not occur, as there exists no historical documentation to support the proposed events of that night (i.e., police reports, hospital records, newspaper articles, etc.). He suggests that the myth was created in the 20th century, to reframe the birth of cinema in a way to support the dominant ways of thinking about film (i.e., as psychoanalytic, narrative, and "new" medium). Martin Loiperdinger, "Lumière's Arrival of the Train: Cinema's Founding Myth," *The Moving Image* 4, No. 1, (Spring 2004).

encountering this threatening and rampant image with no defense, with no tradition by which to understand it. The absolute novelty of the moving image therefore reduced them to a state usually attributed to savages in their primal encounter with the advanced technology of Western colonialists, howling and fleeing in impotent terror before the power of the machine.[35]

However, the socio-technological environment of Paris at the time could not have allowed for this primal encounter; as Gunning describes there was a strong history of the projected arts and living pictures already imbedded in the culture. The photographic image with its inscriptive capabilities was already a popular practice throughout Europe and North America (as seen through the popularity of fads such as the stereoscopic, and what would become a staple of cultural capital, the photographic portrait); photographic images themselves would not have shocked the audience.[36] The photographic image as a moving image had also been commodified as an experience through Edison's personal viewing kinetoscope which was originally developed in 1889, premiered at the Parisian World's Exposition in that same year, and was placed in kinetoscope parlours—where patrons would pay-per-view of a movie on one of the machines—in 1894. So why has the illusion of cinema grounded this founding myth?

One reason is that the illusionary quality of cinema (the goal of much narrative, documentary and some none-narrative cinematic practices) has a cultural heritage that is not inherently based on the technological or material aspects of the medium. Instead, the idea of cinema as an illusion space is based on a twentieth century rehistorization that frames cinema in a specific way based on the dominance of commercial narrative cinema practices, practices which engender a focus on cinema that privilege 1) the story and/or screen content of the film, 2) the socioeconomically substructures of production and exhibition, and/or 3) questions of authenticity and aura in the conceptualization

---

[35] Gunning, 115.

[36] Many books on the history of photography will establish the proliferation of photography in the mid-to-late nineteenth century, but Grace Seiberling's *Amateurs, Photography and the Mid-Victorian Imagination* is specifically helpful in illustrating the common practice of photography throughout economic and social classes (Grace Seiberling, *Amateurs, Photography and the Mid-Victorian Imagination* [Chicago: University of Chicago Press, 1986]).

of cinema as art. Within this contextualization, cinema necessarily becomes conceived and used as a technology of reproduction (the site of re-presenting the filmstrip, which in itself is the inscription of an other spacetime) severed from its material and technological base. Cinema's history as a projected art gets lost under the illusion of this representation (i.e., that cinema is an art of illusion, and that this illusion is the site from which theoretical investigation begins). As this chapter establishes, an exploration of the technological and material aspects of the medium, focused on the projector and the act of projection, resituates the concept of cinema from illusory to immersive—a nuanced distinction, but one that proves insightful in discussing issues of audience reception and agency.

My definition of immersive media is influenced by Oliver Grau's work on art history and virtual reality, wherein he defines virtuality based on an interactive production of space (i.e., that which can be defined as "immersive space" engages in "phenomenologies, functions and [media] strategies of all-embracing image worlds").[37] According to Grau's definition, whereas illusion space aims to fully absorb the viewer in a representation, immersion space is defined by the dialectical tension between critical distance and "emotional involvement in what is happening."[38] I would argue that, in cinema, one way to engender the critical distance necessary to evoke this immersive space is through an awareness of the material and technological controls that produce the "virtual" reality, i.e., the performance of the projector prompts a *liveness* in the presentation of the camera's/filmstrip's representation. However, I would also suggest that the illusion of cinema, as something that is reinforced through the doctrine of ways of seeing film, is best seen when looking at the technology that supports the illusion (i.e., the physical conditions of the site of reception, and the technology that makes possible the idea of illusion). To this effect, the projector's noises, as a

---

[37] Oliver Grau, *Virtual Art: From Illusion to Immersion* (Cambridge, Massachusetts: The MIT Press, 2003), 6.
[38] Grau, 13.

sensorial distraction and/or unwanted addition to the transmission of communication, disrupts the potentiality of an illusion space, creating instead a dialectically charged immersion space. In this sense, Grau's definition of immersion space is close to Sobchack's interpretation of cinematic space as embodied, although for her, the dialectical tension she attributes to the sense of embodiment is based on temporality (the discord between the spacetime of the screen against the spacetime of the lived body) rather than ontological perception.[39]

In his media archaeology of virtual reality, Grau suggests that immersion space is not specific to a particular medium, but engendered from a particular negotiation of space between a technology and perception. In contemporary practices of digitally-based virtual reality environments, the participant (as the post-modern ancestor of the observer and audience) is physically tethered to his/her lived spacetime by the technological apparatus. Surprisingly, Grau's exploration of cinema is based on image space (the interaction between the audience and the screen content),[40] and in discussing the founding myth, he suggests that the illusion space of cinema is due in large part to the newness of the technological medium. Grau refers to a similar fright experienced by the audience in early panorama (a technology I will discuss in relation to the phantasmagoria later in this chapter), which engendered the same spirited and active reception as early cinema. But what Grau misses is that this reception was not emblematic of the introduction of a new media to an ill-prepared audience, but a specific engagement in cinematic space based on *performativity* and *liveness*, which I will establish was not "new" or unusual to its audience.

Through a media archaeology of the projector, this immersive experience of cinema, endemic to what I call embodied cinematic space, can be traced back to antiquity. The camera

---

[39] Vivian Sobchack, *Carnal Thoughts: Embodiment and Moving Image Culture* (Berkeley, California: University of California Press, 2004).

[40] And, inexplicably, based on the socio-technological history Grau himself puts forward with regard to the media archaeology of virtual reality, Grau returns to the idea of the passive naïveté of that first cinema audience (Grau, 151-152).

obscura, the telescope and the magic lantern situate the experience of this embodied cinematic space well before the formal birth of projected cinema (as eternalized in cinema's founding myth). It is my belief that, while the normative reception of cinema is one based on illusion (a historical perspective gained from the looking away from the technological apparatus), it is possible to see the dialectical tensions both Grau and Sobchack describe by looking at the projector. To the audience, the projector's noises produce a rupture in the illusion, for they ground the lived experience of the body in the live theatre space in which the projection is taking place (instead of in the recorded and represented screen space of the projected image).

As this chapter will establish, the expressive qualities of cinema the ways of seeing based on the experience of the medium as a mass *projected art*, were normalized within Parisian culture through magic lantern shows, phantasmagoria, and optical toys that had gained popularity throughout the eighteenth and nineteenth centuries. The foundation for cinema's founding myth is, as such, unsteady. As Loiperdinger states in his material analysis of the myth (and I can support with my own first-hand experience with the Cinématographe), the projected images generated at that first screening would not have been viewed as "natural." First of all, the images were in black and white. One of the most ubiquitous complaints about early cinema was its inability to provide a natural image defined as colourful, representative of the images produced by the eye. Great efforts were put into colorizing early film through hand-painting individual frames, hand-tinting entire filmstrips and/or chemically toning the emulsion in order to emulate the colour imagery perceived by the human eye. Further, the Cinématographe generated a noisy and flickery image that would not have seemed to exist in "real time." Instead, the movement of the filmed subjects would appear jerky and unnatural. The theatre space also impeded realism as the projector was in front of the audience—a necessity because of the short throw of the projector. Not only were the projector and projectionist *seen* by the audience, but also the projectionist's hand often interrupted the projected light because of

a design flaw in the first Cinématographes (the hand crank was on the back of the machines before being moved to the side to ensure that cranking the projector would not disrupt the projection (see figure 1.2)). The screen in these early cinemas was comparatively small, and the ambient noises comparatively loud. As a whole, the experience of cinema was hardly the visual and auditory sensory illusion of contemporary three-dimensional Dolby surround-sound multiplexes. Finally, the act of projection was already familiar to the audience: magic lanterns were a social symbol of status, owned by many aristocratic and bourgeois families; magic lantern shows were common social events; and moving images as children's toys were popular gifts. So, why the myth? What need does the myth fulfill in the construction of the idea of cinema? And why does it focus on the train?

I will deal more directly with the significance of the train in the last part of this chapter, when discussing Adorno and Eisler's theory on the sound of the projector, but it should be noted that a train film was not in fact shown in that first Lumière screening. The program of the event (readily available online through the Institut Lumière) list the films as follows: *La sortie de l'usine Lumière à Lyon*, *La voltige*, *La pêche aux poisons rouges*, *Le débarquement du Congrès de photographie à Lyon*, *Les forgerons*, *Le jarnier*, *Repas de bébé*, *Le saut à* la *couverture, La Place des Cordeliers à Lyon*, and *La mer*. According to the available documentation, Lumière Brothers did not screen a "train film" until January 26, 1896 (listed in the *Lyon république* as *L'Arrivée d'un train en gare d'un chemin de fer*).[41] To complicate the history of the Lumière train films, only three such films were listed in the Lumière Brothers Film Catalogue: No. 8: *L'Arrivée d'un train en gare (de Villefanche-sur Saône),* No. 127: *Lyon, L'arrivée d'un train a perrache* and No. 653: *L'Arrivée d'un train en gare de la Ciotat.* Loiperdinger supplies support that the brothers recorded multiple versions of the three films. Either No. 8: *L'Arrivée d'un train en gare (de Villefanche-sur Saône),* No. 127: *Lyon, L'arrivée d'un train a perrache* could have been shown in the January 26, 1896 screening as they were completed by that date. Three versions of

---

[41] Loiperdinger, 102-103.

L'Arrivée d'un train en gare de la Ciotat were made, but none were likely ready by January 26, 1896. The first version was likely shot between January 16 and February 3, 1896 (still images from the film were reproduced in a journal March 13, 1896); the second was shot in winter, likely in late 1886 or early 1887; and the third, the most ubiquitously screened and remembered version, was shot in the summer of 1897. This final version is listed as No. 653 in the *Lumière Brothers Film Catalogue*.[42]

So why build cinema's founding myth around a train film, when even the most cursory investigation will establish that no such film was shown at that first screening? Why risk this problematic history? The most plausible explanation comes from Gunning, who suggests that the myth is more ideologically based than historically accurate. For Gunning, cinema's founding myth helps to establish a lineage between cinema and art/performance practices. *Arrival of a Train at the Station*[43] [*sic*] mimics the aesthetics of illusion found in *trompe l'oeil* performances and/or visual art practices, an aesthetic that Gunning proposes lies at the heart of the cinema of attractions. For Gunning, the cinema of attractions is a mode that defined film until the domination of narrative film around 1903/1904. Based on the *trompe l'oeil* popular in magic theatre and magic lantern shows, the cinema of attractions sought to amaze and excite its audience with impossible illusion and stunts. As Gunning explains:

> The aesthetics of attraction addresses the audience directly, sometimes, as in these early train films, exaggerating this confrontation in an experience of assault. Rather than being an involvement with narrative action or empathy with character psychology, the cinema of attractions solicits a highly conscious awareness of the film image engaging the viewer's curiosity. The spectator does not get lost in a fictional world and its drama, but remains aware of the act of looking, the excitement of curiosity and its fulfillment. Through a variety of formal means, the images of the cinema of attractions rush forward to meet their viewers. These devices range from the implied collision of the early railroad films to the performance style of the same periods, when actors nodded and gestured at the camera (e.g., Méliès on screen

---

42 Ibid.
43 Gunning's use of this generic English translation allows him to bypass some of the historical discontinuity of the founding myth (i.e. he could be referring to any of the three train films listed in the Lumière Brothers Film Catalogue).

directing attention to the transformations he causes) or when a showman lecturer presented the views to the audience.[44]

Gunning focuses on the audience's experience of the screen content, suggesting that the reaction to *Arrival of a Train at the Station* was part of the audience's engagement with the film as an *attraction*. It is worth asking if the films on the original program December 28, 1895 had the same energy, dynamism and visceral thrill as *L'Arrivée d'un train en gare de la Ciotat* to engender from the audience thia sense of excitement or elicit scopic pleasure.

There is, however, a strong similarity between Gunning's idea of cinema of attractions and my notion of cinema *performativity*. In both, the audience plays an active role in *the production of cinematic space*, insofar as they are actively participating with the screen content *while* engaging in their present lived environment. The fourth wall is *always* broken,[45] although, my theory is that this rupture was at this time caused by the noisiness of the projector insofar as that noise forces an awareness of the lived body within the act of projection.

What Gunning neglects is that the materiality of the technology of projection is just as important to our story as the cinematic space it helps to produce. The projector and its labour are central to the production of cinematic space (i.e., the dialectical relationship between the liveness of the event and the projected content). The projector, as a material and ideological instrument, has a history, a narrative, a way of being. The next section of this chapter explores an archaeology of the projector and an analysis of the space that these technologies help to produce. Considering the ideological and historical context of the myth, coupled with a material analysis of the technologies leading up to cinema-as-projected-art will help demonstrate the reasons that cinema's founding myth has had such historical and cultural endurance, as well as illustrate the centrality of the projector to

---

[44] Gunning, 121.

[45] The fourth wall is a term taken from theatre to describe the "invisible barrier which separated the inhabitants of a room on the stage from us ordinary mortals whose fortune is to look but never enter it" (William Aubrey Darlington, *Through the Fourth Wall* [London: Chapman and Hall Ltd, 1922], 11). In cinema, this fourth wall quite literally refers to the screen.

the idea of cinema and cinematic space. In keeping with the problematic of this dissertation, this analysis of the founding myth of cinema also helps us highlight the performative aspects of cinema, the liveness of the event, and the place of the projector's noises in the constructing of cinematic space as embodied.

1.4 Reconstruction: Looking Back at the Projector

My theory of cinema as performative is based largely on attention to the role of the projector as the thing that moves the image and that engenders the experience of cinematic space as embodied. The first step in understanding cinema's history as a projected art is to look at the history of the technology that led up to the development of the film projector. This chapter reframes the way we *think* about cinema by looking at how the projector and its ancestors (the camera obscura, the telescope and the magic lantern) have produced a particular experience of space as multi-dimensional, expansive and embodied. In the history of cinema currently in practice, the camera obscura and the telescope have been treated as *inscriptive* media that help the observer record an external phenomenon on paper or optic tissue.[46] From this perspective, the camera obscura and the telescope are thought of as precursors to the camera. However, as I will show in this section, the camera obscura and the telescope were also imagined as projectors and used to produce multi-dimensional, expanded and embodied space (i.e., cinematic space before cinema). While in the accepted history of cinema, the magic lantern has been considered an early projector, its projection has been thought of as generating a passive, disembodied visual experience. The *performativity* of this technology (i.e., the relationship between the instrument, the body and the production of space) has yet to be fully explored. Looking back at the development of the camera obscura, the telescope and

---

[46] See Jonathan Crary. *Techniques of the Observer* (1990; Repr.,Cambridge, Massachusetts: The MIT Press, 1992), Vivian Sobchack *The Address of the Eye: A Phenomenology of Film Experience* (Princeton, New Jersey: Princeton University Press, 1992), Friedrich Kittler *Optical Media* (Malden, Massachusetts: Polity Press, 2010), etc.

the magic lantern as projectors allows for the analysis of how these media affected our perception of space, which this chapter addresses, but also the *performative* nature of these pre-cinema technologies in the production of cinematic space and their role in producing cinematic space that is dynamic, active and engaging. After exploring the relationship of the projection technologies and the experience of *liveness*, the chapter returns to consider the role of the projector's noises in producing this embodied, performative and immersive cinematic space.

1.4.1 Camera Obscura

The camera obscura has long been though of as a camera (see the work of cinema historians like John H. Hammond, C.W. Ceram and even theorists like Jonathan Crary and Jean Mitry). My reframing of the camera obscura is based on an expanded understanding of the apparatus, looking at its materiality, socio-technological and spatial implications. The camera obscura that I envision moves beyond our contemporary idea of a *camera* (a portable apparatus used to inscribe data in the form of a photographic or image-based reproduction), to look at the apparatus as a projection technology (an apparatus of expression and relocation of inscribed or original data). Traditional framing of the camera obscura cast it as a technology of early modernism that was used for purposes related to science (i.e., to view the unseeable like solar eclipse and solar research) and the fine arts (i.e., to generate Cartesian perspectivalism and realism in drawing and painting). Rather than think of it as this technological apparatus of reproduction, my view of the camera obscura is centered on its potential as a *transformative space*. An etymology of the term camera obscura reveals that it has a *spatial* dimension: the Latin origin of camera obscura translates to English as "dark chamber"; the Greek *καμαρα* (root of camera) translates to arch, chamber or object with an arched cover and σκοτάδι

(root of obscura) to darkness.[47] Both linguistic origins of "camera obscura" point to a dark space and imply directly a physical edifice that surrounds the body of the observer. To me, this physical embodiment of the observer within the technology is representative of the contemporary experience within the movie theater—the embodied space of cinema. The camera obscura, like the movie theatre, was a dark space with a small hole through which light passed, creating on an opposing wall, an inverted image of the natural world beyond the walls of the room (see figure 1.3). The movie theatre is structured around the same principle, only the projected image comes from a film (a reproduction of the natural world) rather than directly from the external world. That is to say, the original socio-technological experience of the camera obscura was more like the one engendered by the projector than the camera. It moves beyond the popular notion that the camera obscura is a machine whose mediation occurs between the lens and the paper or later film (based on the contemporary vision of the camera obscura based on the seventeenth century wooden box model) to a physical space that mediates and transports the observer from one spacetime to another.

1.4.1.1 History

The earliest known experiments with a camera obscura are found in the research of Chinese philosophers Mo Ti and Chaung Chou in fifth century BC and Ancient Greek philosophers Euclid, Plato and Aristotle in fourth century BC. They primarily aimed to better understand reality and representation, and explore the physiology of vision. In this sense, the camera obscura served as an imaginary medium through which philosophers could better understand the outer material world and the inner workings of human physiology. Interestingly, Mo Ti described the science behind the camera obscura as a result of collecting the reflected light "shining forth" from an object: this

---

[47] The spatial foundation of the word camera is also evident in its alternate use: a discussion or meeting that is held "in camera" happens in confidence or private, away from a person or a public audience. This use of the word camera deals specifically with qualifying a kind of *space*.

projected light is passed through a small hole, resulting in an inverted image duplicating the original

object.[48] The objects were seen as *projecting* themselves. The Ancient Greeks similarly described

camera obscura devices as projectors. What was Plato's cave but a naturally occurring camera

obscura?[49] In "The Allegory of the Cave," Plato is basically describing a rudimentary camera

obscura: an "underground den, which has a mouth open towards the light" where the prisoners

(observers) "can only see before them, being prevented by the chains from turning round their

heads" where "they see only their own shadows, or the shadows of one another, which the fire

throws on the opposite wall of the cave."[50] This description of the light shining in and amplifying

the shadows of the prisoners, to me, invokes an image of a projector. Similarly, in *Problematic*,

Aristotle describes what has been interpreted as a rudimentary camera obscura to describe the

relationship between light, reflection and the spatial configuration of the earth, moon, and sun:

> Why is it that during eclipses of the sun, if one views them [sun or moon] through a
> sieve or a leaf for example, that of a plane-tree or any other broad-leaved tree or
> through the two hands with the fingers interlaced, the rays are crescent-shaped in the
> direction of the earth? Is it because, just as, when the light shines through an
> aperture with regular angles, the result is a round figure, namely a cone (the reason
> being that two cones are formed, one between the sun and the aperture and the
> other between the aperture and the ground, and their apices meet), so, when under
> these conditions part is cut off from the orb in the sky, there will be a crescent on
> the other side of the aperture from the illuminant, that is, in the direction of the
> earth (for the rays proceed from that part of the circumference which is a crescent)?
> Now as it were small apertures are formed between the fingers and in a sieve, and so
> the phenomenon can be more clearly demonstrated than when the rays pass through

---

[48] John Hammond, *The Camera Obscura: A Chronicle* (Bristol: Adam Hilger Ltd., 1981), 1.

[49] The relationship between Plato's cave and the photographic arts has been addressed at length by many scholars privileging different analogies: for instance, Richard L. Gregory compares Plato's cave to an eye with a lens (see Richard L. Gregory *Eye and Brain: The Psychology of Seeing* (Princeton, New Jersey: Princeton University Press, 1997)), and Susan Sontag compares the Plato's cave to photography in the first chapter of *On Photography* (Sontag, *On Photography* (1977; repr., New York: Farrar, Strauss and Giroux, 2001). *In Picturing the Self: Changing Views of the Subject in Visual Culture*, Gen Doy traces the linkage between image theory and Plato's cave, through Deleuze and Baudrillard, to the idea of the simulacra, although considering the cave as a type of cameracentric, inscribed and/or photographic text rather than ethereal and/or performative (Doy, *In Picturing the Self: Changing Views of the Subject in Visual Culture* [New York: I.B. Tauris, 2005], 108-109). Terence Wright also suggests an analogy between Plato's cave and the camera obscura (*Visual Impact Culture and the Meaning of Images* [New York: Berg, 2009], 16).

[50] Plato, "Book VII," in *The Republic*, trans. Benjamin Jowett (The Project Gutenberg EBook: August 27, 2008), http://www.gutenberg.org/files/1497/1497-h/1497-h.htm (accessed October 9, 2012).

wide apertures. Such crescents are not formed by the moon, whether in eclipse or waxing or waning, because the rays from its extremities are not clear-cut, but it sheds its light from the middle, and the middle portion of the crescent is but small.[51]

Aristotle's account provides a material analysis of a projected image as specialized representation of the natural celestial world beyond our human reach. Like Plato, Aristotle focused on the binary tension between representation and materiality, the idea and the natural world. But in his more scientifically grounded approach, Aristotle attempts to bring materiality to the representation by explaining the *mechanics* of projection by making the reader aware of the projector. In contrast to Plato, Aristotle's example also emphasized how the camera obscura serves as a technology for the transformation of space by bringing the external (imagined) world into the observer's lived environment. As Hammond points out, one of the aspects that most intrigued Mo Ti, Chuan Chou and Aristotle was the *size* of the shadow, and the fact that if there were two light sources there would be two corresponding shadows. Mo Ti was the first to actually construct a device along the lines of the camera obscura: on one side of a dark room (that he called "a collecting place") Mo Ti draped a screen with a small pinhole in the middle of it; Mo Ti recorded that this pinhole produced an inverted image of the world outside the "collecting place" on the opposing wall.[52]

1.4.1.2 Practice (As a Projector)

While these first descriptions of the camera obscura were discussed in relation to astronomy, physics and optics, the potential of the camera obscura to be a creative tool gained momentum in the fifteenth century with the appropriation of the technology in theatrical and visual art. Leonardo da Vinci is first credited for giving use to the camera obscura in the fine arts. In a notebook from 1490, da Vinci writes:

---

[51] Aristotle, "Book XV," in *Problemata*, trans. E.S. Forester (Oxford: Clarendon Press, 1927) http://archive.org/stream/worksofaristotle07arisuoft/worksofaristotle07arisuoft_djvu.txt (accessed October 9, 2012).

[52] Hammond, 1-2.

An Experiment, showing how objects transmit their images or pictures, intersecting within the eye in the crystalline humour is seen when by some small round hole penetrate the images of illuminated objects into a very dark chamber. Then, receive these images on a white paper placed within the dark room and rather near to the hole and you will see all the objects on the paper in their proper forms and colours, but much smaller; and they will be upside down by reason of that very intersection. These images, being transmitted from a place illuminated by the sun will seem as if actually painted on this paper which must be extremely thin and looked at from far behind.[53]

What da Vinci is describing is rear projection (a technique which, as we will see later, became popular in phantasmagoria, and is still used in avant-garde cinema performances today) and could as easily describe a modern movie viewing experience. Further, da Vinci's description of the camera obscura is of a lived space in which the observer experiences the projection in real time (i.e., into which the temporal and spatial external world was *projected*). Not only is da Vinci's camera obscura framed as a projector, but it also indicates the existence of cinematic space (as an embodied transformation of spacetime) before the invention of cinema.

Da Vinci was not alone in his use of the camera obscura as a movie theatre. In the mid-sixteenth century fellow Italian Giambattista della Porta used the camera obscura as a movie projector in his live theatrical performances. Porta was a well known playwright. He placed his audience *inside* the camera obscura. In doing so, Porta created what should be considered the first public movie theatre. Porta realized that polished glass (i.e., a mirror) could be used to correct the inverted image produced through the camera obscura. Although there are no images of his setup, Porta suggests in his written documentation that he projected representations of life-like images into the audience-filled camera obscura:

That in a dark chamber by white sheets objected, one may see as clearly and perspicuously, as if they were before his eyes, huntings, banquets, armies of enemies, plays, and all things else that one desires. Let there be over against that chamber, where you desire to represent things, some spacious plain, where the sun can freely

---

[53] Leonardo Da Vinci, "How the Image of Objects Received by the Eye Intersect Within the Crystalline Humour of the Eye" in *The Notebooks of Leonardo Da Vinci, Volume* 1, ed. Jean Paul Richter, trans. Mrs. R. C. Bell (Mineola, New York: Dover Publications, 1970), 44-45.

shine. Upon that you shall set trees in order, also woods, mountains, rivers, and animals that are really so, or made by art, of wood, or some other matter. You must frame little children in them, as we use to bring them in when comedies are acted. And you must counterfeit Stags, Boar, Rhinocerets, Elephants, Lions, and what other creatures you please. Then by degrees they must appear, as coming out of their dens, upon the plain. The hunter must come with his hunting pole, nets, arrows, and other necessaries, that may represent hunting. Let there be horns, Cornets, and trumpets sounded. Those that are in the chamber shall see trees, animals, hunters faces, and all the rest so plainly, that they cannot tell whether they be true or delusions.[54]

Inside the camera obscura, Porta could produce fantastic environments, the likes of which his audience had never seen. Through the use of the camera obscura, as a projector, Porta was no longer limited by the quantity, availability or plausibility of his scenes or settings. The camera obscura let him imagine the potential of his theatre. He could produce and change numerous images seemingly instantaneously. He could also arrange any number of characters and actualize the visualization produced in his imagination.

However, the moving images that created his backdrop were only one aspect of Porta's visual magic. Porta added to the spectacle by combining live performance (actors performing inside the camera obscura) with his reproductions, and sometimes combined the two (some of his actors also performed outside of the device). Porta did project onto a white wall, but would also place mirrors inside the camera obscura to reflect and further multiply his images. Sound was a very important element of the performance. The apparitions of actors within that space, combined with the recreation of sounds, music and dialogue all leant to the surreal experience within what Porta called his "amphitheater."[55] Porta saw that the camera obscura was a performative and transformational space—in which the projection of the external world worked in counterpoint to the lived experience of the observer within the dark chamber. As a drawing aid, the labour of the

---

[54] Giambattista della Porta, "Book 17: Of Strange Glasses, Chapter VI: Other Operations of a Concave-Glass" in *Natural Magick*, trans. Unknown (London: Thomas Young and Samuel Speed, 1658), http://www.mindserpent.com/American_History/books/Porta/jportac17.html#bk17VI (accessed October 9, 2012).

[55] Ibid.

camera obscura centered on transmitting and moving objects in space (negotiating the lived space and subjectivity of the observer by transforming the external world into a flat, fragmented visual representation), but Porta recognized the performative aspects of this space and the cultural potential of this visual spectacle. Porta, I argue, was one of the first to *imagine* cinematic space.

Despite these examples of the use of the camera obscura in the production of a *social space*, the device was principally used by individuals and served as a means of visualizing the production of *inner* and/or *subjective space*. By the early seventeenth century, the architecture of the camera obscura was remodeled: the technology was reducing in size and gaining portability. With the help of lenses and mirrors, the image could be focused and seen upright. By 1611, Johannes Kepler had designed a camera obscura in the form of a small portable tent that could be placed anywhere and allowed the observer to trace the projected image on a sheet inside the enclosure. The aperture of Kepler's camera was placed at the top of the tent and could rotate to locate the observer's desired scene. Instead of tracing the image off of a wall, the image was now projected onto a table. One could imagine the portable camera obscura as a model of an early laptop computer, expanding our concept of the world by bringing any part of the external world to our table or desk. Another portable version of the camera obscura gained popularity around 1670 was the box model,[56] which would lead to the development of the Daguerreotype (Johannes Zahn illustrates this model in the second part of *Oculus artificialis* dated 1686 (see figure 1.4). By this point, the idea of the camera obscura as an embodied space produced through the earlier versions of the camera obscura as exemplified by

---

[56] Developed by Bavarian mathematician Christoph Sturm, this portable camera obscura could be described as a lightbox. It consisted of two paper boxes, one placed inside the other in order to shorten and lengthen the chamber depending on the focal distance, it also featured an adjustable "wooden eye" fixed to a lens, which could be turned in any direction. Inside the box, Sturm placed a mirror on an incline. The reproduced image could then be seen through a thin transparent layer of paper, which had been soaked in oil to increase its transparency, as if the image were emanating out from the inside of the box. The observer could then trace the image, with surprising detail, directly onto the oiled paper (later used in early photographic processes). For more details, see Laurent Mannoni, *The Great Art of Light and Shadow: Archaeology of the Cinema,* trans. Richard Crangle (Exeter, Devon: University of Exeter Press, 2000).

Porta's apparatus had been lost to its use as a drawing aid in the reproduction of the visual space produced by geometrical perspectivism. These earlier alternative examples of innovative uses of the camera obscura are important to retrieve in a history of cinema because they highlight the potential for employing these devices in the construction of space and in our understanding of perception. Only in looking back can we see that Porta's incorporation of the camera obscura in his plays was not intended to help establish or understand the objective reality of the outer world, or the physiology of optics, but to create an *imaginary space* that only exists in the real-time of the performance (and that cannot be stored or duplicated).

1.4.1.3 Thought

By examining the nuanced relationship between the audience and the apparatus with regard to the performative aspects of the camera obscura, it is possible to see the distinction between my thesis that projection technologies invited/produced an active audience (thought of in terms of a collective rather than individualistic observers) and the theses of those theorists (Crary, Metz, Baudry, Mulvey, et al) who focus on the individual and/or physiological responses to cinema. In *Techniques of the Observer*, Jonathan Crary suggests the camera obscura was a primary model for the modern concept of subjectivity (i.e., the exploration of a personal and distinct sense of perception of the external world and that there was a autonomy to this interiority). He states:

> Above all it [the camera obscura] indicates the appearance of a new model of subjectivity, the hegemony of new subject-effect. First of all the camera obscura performs an operation of individuation; that is, it necessarily defines an observer as isolated, enclosed, and autonomous within its dark confines. It implies a kind of *askesis*, or withdrawal from the world, in order to regulate and purify one's relation to the manifold contents of the now "exterior" world. Thus the camera obscura is inseparable from a certain metaphysics of interiority: it is a figure for both the observer who is nominally a free sovereign individual and a privatized subject confined to a quasi-domestic space, cut off from the exterior world.[57]

---

[57] Crary, 39.

Whereas Crary suggests that the camera obscura provided a model for private knowledge, I suggest that it establishes the potential for a model of collective production based on the liveness of the event, and the liveness of the collective "creation" of the product through the dialectical relationship between the lived body and the intellectual/psychological experience of cinematic space. These qualities of *liveness* and *performativity* are carried through to the cinema. The embodied space of cinema is at once felt through the material engagement with the world, and imagined through the representational sensation of the screen space. As such, the camera obscura can be seen as a cinematic space—an embodied cinematic space—produced before the formal invention of cinema as demarcated by cinema's founding myth.

Through looking back at the camera obscura, we can see the presence of cinematic space *before* the concept of cinema. In this sense, cinematic space is not dependent on the actual performance of a film; the camera obscura produced a cinematic space although no filmstrip or prior recording was involved in the process but is defined through the labour of the projector.[58] As established throughout this section, the space inside the camera obscura was imagined, embodied and performed (i.e., the audience/observer had an active role in producing and experiencing the lived space watching images within the apparatus). The observer's body and interpretation inherently mediated the projection of the external world in what has been conceived of as a privatized space, within the camera obscura. Beyond this subjective experience, there was also the indexical relationship with the objective external world: the image projected within the camera obscura also *moved* (i.e., the image was changed by the movement of the sun, by the wind, by the natural forces uncontrollable by the artist and/or observer). As such, the camera obscura mirrored the modern movie theatre experience, and should be considered an important cultural artifact in the archaeology of the projector.

[58] This echoes Hollis Frampton's description of cinema in his essay "A Lecture," discussed in the introduction of this dissertation, as anything placed inside a projector to transform its light beam.

1.4.2 Telescope

The relationship between the projector and the telescope may not seem as obvious, but the telescope is also an important figure in an archaeology of the projector not only because of lens technology, but also because of the ways the telescope mediated the experience of space. The telescope was actually used as a projector in the early years after its inception. In order to view and record the cosmic world, astronomers would use the telescope to project and trace the outline of planets and planetary phenomena on paper. This section rehistoricizes the telescope as a projector, with the goal of establishing its role in the production of cinematic space.

1.4.2.1 History

The next imaginary media on the path to the projector was the telescope (whose job it was to transport and focus), which was closely related to the development of another visual instrument the microscope (whose job it was to expand and amplify). Both the telescope and the microscope demanded the same innovations in lens technology. This lens technology would then be carried through to magic lanterns, film projectors and film cameras. It is possible that Roger Bacon, a Franciscan monk living in England in the thirteenth century, fashioned himself a telescope and perhaps a microscope.[59] At the very least, Bacon *imagined* these technologies as conceptual media/apparatuses/machines. In a manuscript found in an Austrian Castle in 1912, Bacon wrote

---

[59] Albert Van Holden suggests that, while Bacon describes the basic mechanics of a telescope (a device that refracts light so as to visually displace an object to appear as either nearer or farther than it actually is), the monk was actually referring to a kind of early spectacles or monocle. Regardless, Bacon does *imagine* an instrument for visual amplification. As Bacon states, quoted in Van Holden: "For we can so shape transparent bodies, and arrange them in such a way with respect to our sight and objects of vision, that the rays will be refracted and bent in any direction we desire, and under any angle we wish we shall see the object near or at a distance. Thus from an incredible distance we might read the smallest letters and number grains of dust and sand owing to the magnitude of the angle under which we viewed them, and very large bodies close to us we might scarcely see because of the smallness of the angle under which we saw them, for distance in such vision is not a factor except by accident, but the size of the angle is." Van Holden, "The Invention of the Microscope" in *Transactions of the American Philosophical Society*, New Series, Vol. 67, No. 4 (1977): 28.

about the telescope in detail as an instrument capable of aiding in the production of celestial

diagrams.[60] The technological achievement of a working telescope would have been unlikely in the

thirteenth century, when the practical knowledge of corrective eyewear was still in its experimental

stage. The telescope depends on a double lens system (the first – a large convex lens – to magnify

the object/target and the second – a small concave lens – to focus the image of the object) at a

specific focal distance (approximately 8-12 inches, based on the typical corrective lenses available in

mass at optometry shops around 1600).[61] Van Holden suggests that it is more likely that Galileo

Galilei and Kepler, two astronomers in fierce competition with each other to develop "the best"

devices, created the first working telescopes in the early seventeenth century.[62] In 1610, Galileo

published *Sidereus nuncius* in which he discussed his telescopic discoveries. Galileo's telescope

featured a convex convergent lens followed by a concave divergent lens, with different aperture

stops to help adjust light density (this aperture technology would be translated into photographic

cameras). In 1611, Kepler published *Dioptrice* in which he discusses his two bi-convex lens telescope,

a system that would later be adapted for motion picture projector and camera lenses. These dual lens

systems allowed the operator/observer to *focus* on a specific object plane. Most modern commercial

projectors have much more complex seven-lens projection systems, but the basic physics is still

based on fundamental optics of telescopy.

---

[60] This manuscript contained a letter to Athanasius Kircher from Marcus Marci, dated 1665, stating that the text was attributed to Bacon. The manuscript was written entirely in cipher. Bacon's reasons for encrypting his writing were understandable. Bacon spent a good deal of his life imprisoned because of his relentless pursuit of scientific knowledge in an age ruled by Christian ideology. It is understandable that he would want to preserve his most insightful discoveries, while protecting the information (and himself). See James Stokley, "Did Roger Bacon have a Telescope?" *The Science News-Letter* 14, no. 386 (Sep. 1, 1928): 125-126, 133-134. Gustave Fassin corroborates the hypothesis that the technology for grinding and polishing glass was being perfected in the 13th century, so it is possible that Bacon did have a magnifying lens through which he observed the world (Gustave Fassin "Something About the Early History of the Microscope," *The Scientific Monthly* 38, no. 5 (May, 1934): 452-459). Jean Mitry goes a step further and credits Bacon with inventing the first magic lantern (Jean Mitry, *Histore du Cinéma* [Paris, France: Éditions universitaires, 1967], 23).

[61] Van Holden, "The Invention of the Microscope," 9-11.

[62] Van Holden, 16-20.

1.4.2.2 Practice (As a Projector)

If we were to consider cinema as the extension of the eye using McLuhan's explorative

approach to media theory, no other technology could be better described as its precursor than the

telescope. Cinema can be seen as extending either the eye of the filmmaker (by taking the

filmmaker's vision to the audience) or the audience (by expanding the audience's eye through the

screen).[63] Similarly, the telescope figuratively extends the human eye; held up to the eyeball it

functions to enhance our visual sense modality, to amplify our vision. Of course, the telescope

produces a specific kind of extended space: that which McLuhan would define as *visual* insofar as the

telescope creates a limited tunnel vision effect (that fragmenting, isolating, and disembodying

experience in a culture based on a visual space). However, in the seventeenth century, the telescope

was also used in a more acoustic[64] or holistic way for understanding the dynamic movement of

objects over time. Documentation suggests the telescope, like the camera obscura, was used as a

projector to project the external distant world onto a page that was then traced by the observer. The

observer would not hold the telescope to his or her eye. Instead the observer would look at the

projection on the piece of paper. For instance, an illustration in Kircher's 1645 edition *Ars magna lucis et*

umbrae shows a telescope aimed at the sky (or Apollo, the humanoid god representing the sun),

projecting an image onto a sheet of paper (see figure 1.5 and figure 1.6). Similarly, in Christoph

Scheiner's *Rosa Ursina* (1630), there is an illustration of a telescope set up as a projector to chart the

apparition and movement of sunspots (see figure 1.7). The telescope was used to produce the

---

[63] Perhaps the most famous reference to the idea of cinema as an extended eye comes from Dziga Vertov. In explaining his theory of the Kino-Eye (although a cameracentric approach to cinema), Vertov defines the telescope as the eye that "reaches distant worlds, inaccessible to my naked eye" and the Kino-eye "as 'that which the eye doesn't see,' as the microscope and telescope of time, as the possibility of seeing without limits and distances, as the remote control of movie cameras, as tele-eye, as X-ray eye, as 'life caught unawares," Dziga Vertov, "The Birth of the Kino-Eye" in *Kino-Eye: The Writings of Dziga Vertov*, ed. Annette Michelson, trans. Kevin O'Brien (Berkeley: University of California Press, 1984): 41.

[64] By acoustic here I mean expansive, dynamic and spatial, in the McLuhan sense of acoustic space, not as an aural or audible phenomenon.

projection of *moving images* in real time. While the multiple drawings of these sunspots appear on the same page (i.e., traced images drawn by the observer onto a sheet of paper from the projected image), each one was a *record* of the performance (of the movement of the distant objects *and* of the act of projection). The telescope-as-projector transformed the lived space of the observer by condensing time and space into a new environment. The telescope, like the *camera obscura*, produced a sense of cinematic space. The observer was engaged in a spatial duality between being here (in the physical space of his/her body) and being there (in the screen space of the image). Through the telescope, the observer was transported to a fantastic and foreign place, completely outside his/her physical, lived experience—quite literally another world—while remaining in the comfort of his/her home territory.

Despite the similarities between the camera obscura and the telescope insofar as both were used to trace drawings of the external world, the telescope has not yet been considered an artistic medium. However, the scientific drawings produced using the telescope-as-projector should be considered as rich texts in the history of moving image animation. The drawings produced by Scheiner through the telescope-as-projector should be considered as pre-cinema gestures; they were literally some of the first *motion* pictures ever produced, in the genre of dynamic motion made famous by Étienne-Jules Marey (where an object is followed as it moves through time on a single photographic plane (see figure 1.8)). The paintings produced through the use of the camera obscura were not intended to show time, whereas the Scheiner's charts were meant to show the transformations of the object over time. And, while the camera obscura existed to the observer/painter as an embodied space, the product/painting provided no trace of this embodiment. Scheiner's drawings, conversely, offered the embodied space of the observer/artist through the representation of the object over time (since, implied in this temporality was the physical endurance of the artist to complete the artwork).

1.4.2.3 Thought

Crary suggests that the eye and the camera obscura and the eye and the telescope were linked through a "conceptual similarity in which the authority of an ideal eye remained unchallenged" until the nineteenth century when "the relationship between the eye and the optical apparatus becomes one of metonymy: both were now congruous instruments on the same plane of operation, with varying capabilities and features."[65] Each observer naturally has a different eye and a difference sense of vision. Looking back, it is difficult to imagine a time when sensory engagement with space was not considered a subjective experience. However, the lived body of that seventeenth century observer was paramount to the production of his/her surrounding space. Like the *camera obscura*, the telescope served to change the way that space was produced and enhanced our subjective relationship with the external world. And like the embodied space of the camera obscura, that space being produced through this new transformative instrument was, I argue, cinematic. The camera obscura and the telescope, in this sense, produced cinematic space before the birth of cinema.

Beyond the dialectical relationship between subjective and objective experience, the telescope, when thought of as a cinematic apparatus, also produced a collapse of time and space. Through the telescope, the unimaginably distant was re-presented in the private space of the observer. The distant object brought to this private space its own experience of time (i.e., the rhythm of the sunspot explosions, the axis on which the planets spun in relation to the Earth's orbit, etc). The projected images (which carried a representation of "an other" time) were experienced by the lived body of the observer as a duality of time (i.e., the representation of a live event within the live event of the transcription). For Zielinski, the telescope also had one important quality (one typically given to projectors): the ability to "keep time." Zielinski is referring at once to the telescope's role in the concept of transporting and maintaining time systems. The projector, as

---

[65] Crary, 129.

discussed by Mark Slade, is a "clock without hands"[66] that is primarily constructed of "a clockwork mechanism; it ticks, not in seconds, but in twenty-fourths of a second,"[67] but the telescope, according to Zielinski, helped to standardize time from village to village up to three miles apart.[68] Through the telescope, the clock towers of a distant village could be read and synchronized. A network system of villages armed with telescopes could therefore establish a standardized time (as long as the weather was clear enough to see the distant towers). However, speaking directly to the relationship between telescopes and cinema, messages travelling by these telescope networks could be shared between villages, counties, countries, etc., much like cinema is a communicative tool with the potential of distributing the same content to various places. The projector, similarly, keeps time, i.e., the timed movement of the film. The projector moves each individual frame connected on the filmstrip. But, as Zielinski points out, neither the telescope's nor the projector's "timing" is in "real time," for as he states, the telescope as an "instrument for decreasing spatial distances optically actually fulfilled the same function as fast-motion in film, for it connected places that were far apart."[69] The images brought together by the telescope and the projector may be experienced in real time through the *performativity* of the instruments, but they represent distinct and distant moments as physical temporality.

While the camera obscura offered the genesis of cinematic space before the invention of cinema, the telescope brought forth cinematic time by transforming and synchronizing the way time was experienced across space.

---

[66] The idea of the projector as a clock without hands was further perpetuated by the magic lantern, which I will discuss shortly.

[67] Mark Slade, *Language of Change* (Toronto: Holt, Rinehart and Winston of Canada, Ltd, 1970), 15.

[68] Siegfried Zielinski, *Deep Time of the Media* (Cambridge, Massachusetts: The MIT Press, 2006), 187.

[69] Zielinski, *Deep Time of the Media*, 188.

1.4.3 Magic Lantern

Of all the technology discussed in this chapter, the relationship between the magic lantern and the projector is the most obvious. Certainly it is the most easily imagined and historically evidenced. The magic lantern and the film projector share a common role: they both *projected* something for the entertainment and/or enlightenment of an audience. This commonality is supplemented by the fact that the magic lantern was actually a key component of early film projection: as mentioned in the beginning of this chapter, the magic lantern was positioned behind the body of the Cinématographe to create the first cinema projector. As the labour between projection and inscription became more distinct and defined, the body of the magic lantern melded with motion picture mechanics to create the foundation of the solid-body film projector.[70] While the lamp house and the motion picture mechanics are still physically separate from each other (see figure 1.9), solid body projectors (instruments for projection only that could not be taken apart) were marketed by the 1910s.[71] The amalgamation of the magic lantern and motion picture mechanics is most obvious in the home viewing technology, when projectors began being sold solely for the purpose of "playing back" films.[72] Pathé produced and distributed 28mm film (on less flammable diacetate rather than the 35mm nitrate filmstock in commercial use) and a 28mm projector the Pathé Kok (their company logo was an image of a rooster). This small gauge innovation was followed with the production of the 9.5mm film by Pathé Baby in 1922, 16mm film by Eastman Kodak in 1923

---

[70] This transition occurred around 1907, when the intermittent mechanism allowed for projectors to exhibit films that were not shot on the same machines. The division between the camera and the projector was reinforced by the development of home movie viewing, in which commercial motion pictures were reduced to 16mm, 9.5mm and/or 28mm for home projection.

[71] This is evidenced by the advertisements for commercial projectors in *The Moving Picture World* and *The Optical Lantern and Cinematograph Journal*.

[72] For an expanded look at the history of film as a early home viewing technology, see Ben Singer, "Early Home Cinema and the Edison Home Projecting Kinetoscope," *Film History* 2, no. 1 (Winter, 1988): 37-69, and Haidee Wasson, "The Reel of the Month Club," in *Going to the Movies: Hollywood and the Social Experience of Cinema*, eds. Richard Maltby, Melvyn Stokes and Robert C. Allen (Exeter, UK: University of Exeter Press, 2007), 217-234.

and 8mm film by Eastman Kodak in 1932 and the consequent production of small gauge projectors for each of their new home-viewing film sizes.

1.4.3.1 History

The concept of "home-viewing" moving images did not begin with cinema; there is a long tradition of magic lanterns shows performed in the home as "family entertainment." In fact, Laurent Mannoni argues that the gimmicky "home entertainment" value of the magic lantern was the main reason Christiaan Huygens's (the likely inventor of the first working magic lantern, although others had previously *imagined* the device) did not promote or advocate his invention.[73] In 1659, Huygens animated his first magic lantern slide, based on Hans Holbein's painting *The Dance of Death* (1538). Huygens's magic lantern slide portrayed a skeleton losing his skull. When projected, Huygens's illustration was animated; the skeleton removes and replaces his head with his right hand. Huygens likely accomplished the animation by preparing a two-piece painted slide system (slides that were moved independently to give the illusion of complex motion.[74] But Huygens wished to maintain his reputation as a serious scientist (he had already, before inventing the magic lantern, been credited with discovering the rings of Saturn and Titan). Although Huygens was said to have used a lantern device to project *animated* illustrations for the amusement of his family and friends,[75] by 1662 he was calling his invention "a bagatelle…already quite old." Later in 1664, when his father asked to borrow his magic lantern for a presentation, Huygens was appalled that a member of his family would "play

---

[73] Huygen's animation of a skeleton, that has a moving head, is perhaps his most famous slide. The fact that this slide, one of the first magic lantern projections, was animated suggests that moving image culture was attached to the apparatus from its conception, and, as such would not be considered shocking in 1895. Mannoni, *The Great Art of Light and Shadow: Archaeology of the Cinema*, 42.

[74] Mannoni, *The Great Art of Light and Shadow: Archaeology of the Cinema*, 115.

[75] Mannoni, *The Great Art of Light and Shadow: Archaeology of the Cinema*, 39.

with such marionettes in the Louvre."[76] As such, Huygens never sought to take his invention public. He did, however, show his magic lantern to Thomas Walgenstein, who developed his own lantern based on Huygens's model (more on Walgenstein shortly).

Other early innovators of the magic lantern like Walgenstein, Zahn and Kircher, and like Huygens, were also invested in telescopes. It is not surprising that the technology behind the telescope figured prominently in the design of the magic lantern. While each inventor personalized his design, all magic lanterns shared the same basic construction: a box-like enclosure which housed an artificial light source (either a candle or oil lamp), a concave mirror behind the light source to amplify the light, a lens in front of the light source to condense the light, a place to affix a slide (typically made of glass or metal), and a long cylindrical tube fitted with two convex lenses (basically a telescope). The physical construction of the magic lantern was possible only through the development of polished glass. The slide animations could be imagined as a direct reversal of telescopy (where telescopes were used to project an image from an outer space onto a piece of paper and then traced by hand), or as a technological combination of telescopy (as a technology of projection) and microscopy (as a technology of amplification). As a technology of projection, the magic lantern was primarily used to project and amplify images drawn by hand onto a wall, extending the optical media of the telescope and the microscope to a mass audience.

1.4.3.2 Practice (As a Projector)

From the very beginning, two uses for the lantern dominated: the apparatus was used as a pedagogical instrument in classrooms and lecture halls to illustrate and accompany lessons especially in biology, astronomy and the natural sciences, or the magic lantern was used as an entertainment instrument either to visually and dynamically relate a story or as a magical tool in the arsenal of

---

[76] Mannoni, *Light and Movement: Incunabula of the Motion Picture 1420-1896* (Pordenone, Italy: Le Giornate del Cinema Muto, 1995): 54.

magicians and performers. Both modes of use, however, highlighted the *performativity* of this early projector. The projections were part of a live event (whether educational or theatrical) and complemented that live experience (i.e., the projected images took on a new life within the context of their place in the performance and their position within the embodied (cinematic) space of that performance).

As an educational instrument, the magic lantern brought the observer a new perspective, either through the amplification of objects and images, and/or the displacement of space and time. Johannes Zahn was probably the best known for his use of the magic lantern as a pedagogical tool. Zahn, who in his 1685-1686 book *Oculus artificialis teledioptricus sive telescopium* describes in great detail (with beautiful illustrations) the magic lantern, the telescope and the *camera obscura*, urged that the magic lantern could be used like a microscope to observe "tiny animals" which when positioned on a glass magic lantern slide "may be represented, extraordinarily enlarged, against a wall or against any white surface."[77] Zahn also designed a model of the magic lantern called the "Artificial Anemoscope" that "projected the exact direction of the wind at any given moment onto a white wall in a darkened room,"[78] and a "lantern clock" that projected time (in the form of a clock) onto a wall. Zahn developed two models of lantern clocks: the first had a clock mechanism hidden in a wall, with only the hands of the clock visible, and a magic lantern would project the face of a clock over the hands (the hands moved, the projected image was static); for the second, the clock hands were painted on the wall and the magic lantern (which was equipped with the clock mechanism) projected a clock face that *moved* around the hands. This second model used a circular spinning glass disk with images positioned along the edge like on Plateau's Phenakistoscope that replaced the traditional

---

[77] Johannes Zahn, *Oculus artificialis teledioptricus sive telescopium* quoted in Mannoni, *Light and Movement: Incunabula of the Motion Picture*, 78. Those versed in avant-garde cinema can imagine Zahn's description as a premonition of Stan Brakhage's *Mothlight* (1963) where small, normalized and mundane objects (moth wings) are amplified on the screen to create something viscerally beautiful and intellectually stimulating.

[78] Mannoni, *The Great Art of Light and Shadow: Archaeology of the Cinema*, 64.

magic lantern rectangular slides.[79] These lantern clocks literally turn projectors into "clocks without hands," and emphasize the role of the projector in the production of cinematic time pre-cinema. Zahn's work also helps to illustrate how magic lanterns were pedagogical tools for instructional learning.

At the other end of the spectrum, two artists in particular gained notoriety for their magic lantern shows: Athanasius Kircher and Thomas Walgenstein. Kircher's and Walgenstein's shows differed in one important way: how the lantern and the lanternist were involved in the production of space. Kircher likely developed or at least imagined a prototype of the magic lantern as early as 1645. He called his invention the catoptric lamp. The diagram and description Kircher provides of his catoptric lamp is somewhat confusing insofar as he does not explain how the image is viewed (perhaps on a wall, perhaps an a surface just slightly extended from the lamp house (see figure 1.10), and whether it would have been viewed by a single observer or a mass audience. The catoptric lamp was engineered like a magic lantern: it was a cylindrical metal box with a concave, reflective mirror behind a light source, it had a smoke hatch for the light source, and it had a "handle" [*manubrium*] to hold the material/drawing to be projected. To be a magic lantern, the catoptric lamp was only missing an amplifying lens.[80] However, while Kircher does not physically add a telescope to his design, he aligns the catoptric lamp with the telescope in his description of "reception" suggesting that the light show possible through his invention was comparable in beauty and enchantment to the

---

[79] Mannoni, *The Great Art of Light and Shadow: Archaeology of the Cinema*, 62-63.

[80] Mannoni's and Zielsnki's explanation for the catoptric lamp were in such conflict that I had the original source material from Athanasius Kircher's *Ars magna lucis et umbrae* (1645) translated from the original Latin. Zielinski's description is closer to the one produced by my translator. Mannoni suggests that Kircher's catoptric lamp was a "wine barrel topped with a chimney, with a handle on the side," with "a burning candle" inside which "was reflected from a parabolic mirror and concentrated by a biconvex lens" (Mannoni, *The Great Art of Light and Shadow: Archaeology of the Cinema*, 22). In Mannoni's opinion, the catoptic lamp was "nothing more than a simple projecting lamp," which, despite this belittling description, was quite an impressive feat in 1645 (Mannoni, *The Great Art of Light and Shadow: Archaeology of the Cinema*, 23). While Zielinski aggress that it is unlikely that Kircher's original model of the catoptric lamp in 1645 led to the development of the magic lantern. Zielinski suggests that the enthusiastic Kircher, in 1645, was reporting on "the state of the art" and that he "discusses with great detail technical competence many uses for the projection of images in dark rooms" (Zielinski, *Deep Time of the Media*, 135-136).

view of the stars from the telescope: "*Nam tam inusitato splendore fulgebit, ut noctu etiam minutissimas literas ope telescopii inspectas nullo negotio exhibeat*/For it will shine (*fulgebit*) with such unusual splendor that likewise at night it exhibits very small letters observed without any trouble with the help of a telescope (*ope telescopii*)."[81] But, his catoptric lamp transformed the mundane into the spectacular (an experience commonly associated with the production of cinematic space).

Kircher's projection technology truly became cinematic with his use of the magic lantern sometime between 1645 and 1671, when, as illustrated in the second edition of *Ars magna lucis et umbrae* (1671), his magic lantern took the shape of a projector for a mass audience. The practical restrictions of the catoptric lamp inspired the particular way in which Kircher mounted his magic lantern, which resembled a contemporary movie theatre. In order to obtain a strong enough light source to project his hand-painted slides, Kircher opted for an open flame. However, in order to optimize reception, the image needed to be projected into a dark space. Kircher decided to segregate his instrument from the audience, as illustrated in the etching of his magic lantern in the 1671 edition of *Ars magna lucis et umbrae* (see figures 1.11 and 1.12). The lantern was placed in a small, contained room with no windows except for the hole through which the image was projected—a space just like contemporary projection booths. As such, Kircher's design for the viewing space of the magic lantern, with the segregated instrument away from his audience, mirrors the design of contemporary movie theatre spaces, where the projector is also segregated from the audience. And, like contemporary commercial film, Kircher's magic lantern shows were vehicles for entertainment (mixed with a heavy dose of morality). Kircher's magic lantern shows often depicted biblical tales, mystical apparitions and popular mythologies. He employed narrative storytelling to entertain his audience while promoting Christian morality. In the two etchings of the magic lantern provided in 1671 edition of *Ars magna lucis et umbrae,* Kircher's magic lantern slides depict different Christian

---

[81] Kircher, *Ars magna lucis et umbrae* (Amstelodami Apud Joannem Janssonium a Waesberge and Haerdes Elizaei Weyerstraet, 1671), 768. Translated by Erika Loic, July 27, 2012.

narratives: in the first, he shows the grim reaper (a skeleton holding a large scythe), and in the other, what Zielinski describes as a "female figure in the crackling flames of purgatory,"[82] but what to me looks to be an illustration of the "Stations of the Cross" (see figure 1.12). Kircher praised the magic lantern for its expressive qualities, having the potential to project images that could be "joyous, sad, horrible or frightening, and for those who were unaware of how they were produced would seem miraculous."[83] Kircher's shows, however, were limited by his elaborate setup: Kircher's magic lanterns, as illustrated, were stationary machines and, like the early camera obscura, bound to a specific physical location.[84] The audience had to come to Kircher in order to see his shows and be stationed within his orchestrated environment. As such, there was little physical movement and/or environmental changes in Kircher's performances—neither the lantern nor the shows moved.

In the 1645 edition of *Ars magnes lucis et umbta*, Kircher pushes the boundaries of projection even further than his contemporaries by envisioning multiple projections. The liveness and *performativity* of cinema is most apparent in multiple projection, for any variation in the composition and/or performance emphasizes the liveness of the cinematic event. Illustrations in *Ars magna lucis et umbrae* which have not been previously discussed by cinema historians or media archaeologists, suggest that Kircher imagined two different types of complex multiple projection. First, anticipating the three-projector model of Cinerama where three projectors were used to create an enlarged, almost panoramic screen, Kircher employed three magic lanterns to extend the screen space of his projections (see figure 1.13 and figure 1.14). Any time multiple projectors are used together, the liveness of projection becomes obvious, at least to the projectionist (whereas, to the audience, the liveness may only be apparent when synchronization between the projectors is disrupted).[85] Of

---

82 Zielinski, *Deep Time of the Media*, 136.
83 Kircher, cited in Mannoni, *The Great Art of Light and Shadow: Archaeology of the Cinema*, 57.
84 This is in contrast to portable lanterns designed by Huygens, Zahn and Walgenstein.
85 Even with the most advanced contemporary projectors, no two motors will be perfectly calibrated and run in perfect sync (i.e., they will not project at exactly the same speed, or start at exactly the same time)

course, Kircher's was projecting still images, not motion pictures. However, double- and triple-lens magic lanterns of the early twentieth century (which I will discuss shortly) show that multiple projections could be used to simulate motion in still images. From the illustration (figure 1.13), it is unclear if Kircher intended to project an extended panoramic image or three separate components to perform a live pastiche or collage. In other illustrations in *Ars magnes lucis et umbta* (1645), Kircher assembles three different projections in order to from a type of live or performative collage/split screen composition (see figure 1.14). The separate images inform each other, but are not intended to create an extended screen space or manipulate movement. Instead they are three projections of separate content projected in three different positions. Kircher's second idea for multiple projection involved superimposing five images on top of each other (see figure 1.15) to create a dynamic composition and potentially changing and/or moving images. In his illustration, Kircher imagines a use for superimposition though the projector (a complex composition produced through the live event) only brought into mainstream culture in the twentieth century. Both multiple projection illustrations are found in the 1645 edition of *Ars magna lucis et umbrae*, and establish the production of cinematic space prior to the physical construction of the magic lantern.

Kircher believed that the magic lantern was his invention and accused Walgenstein of plagiarizing his idea. Mannoni, in defense of Walgenstein, points out that the illustrations that Kircher produced in *Ars magna lucis et umbrae* (1671) were "technically impractical."[86] In Kircher's illustration, the slide is placed in the wrong position (at the end of the lens, between the lens and the screen when it should be positioned between the light source and the lens). Zielinski counters Mannoni's attack by suggesting that the error was on the part of the illustrator, not Kircher

---

unless they have been mechanically altered to run in as "master" and "slave" (which are the terms used by contemporary projectionists to describe the "dummy" relationship between the two projectors when used for double projection). This disparity in the mechanical performance of the machines highlights the immediacy of the production of content as it appears on the screen.

[86] Mannoni, *Light and Movement: Incunabula of the Motion Picture*, 62.

himself.[87] Regardless of the validity of their claims, Walgenstein's magic lantern differed from Kircher's significantly, perhaps not in form, but in function. Walgenstein had a travelling show and had invented a portable magic lantern. The success of Walgenstein's magic lantern show was impervious to Kircher's threats of plagiarism. Walgenstein recognized the entertainment value of the apparatus and used the machine to show "'supernatural' and often terrifying images, which at once frightened and fascinated the public."[88] Walgenstein began travelling with his magic lantern in 1664 and took great pleasure in astonishing his audience with illusions only possible with the magic lantern. Through his travels and his performances, Walgenstein was able to market and distribute his version of the magic lantern—named the *lanterne de peur* by Pierre Petit after witnessing one of Walgenstein's shows in Paris—selling several of them to fascinated aristocrats while en route. Walgenstein's lantern was modeled directly after Huygens's design, the latter having shown the former his original device. Walgenstein's shows were the ancestors of the phantasmagoria that would haunt western European culture through the eighteenth and nineteenth centuries.

Walgenstein also sold models of his portable magic lantern which attached to the projectionist much like an accordion (see figure 1.16). These small, portable lanterns became a choice instrument for vagabonds who would travel into a village during the day, advertise their services, put on a show that night (usually in their patron's home), and leave for the next city. The shows put on by the travelling projectionists typically consisted of slides shows depicting "the Good Lord, Master Sun and Madame Moon, the stars, the King, the Queen, the *gendarme*, the hangman, the morning, the afternoon, the evening, the Seven Deadly Sins, The Elements,"[89] narratives and

---

[87] Zielsinki, *Deep Time of the Media,* 135-136.

[88] Mannoni, *Light and Movement: Incunabula of the Motion Picture*, 42.

[89] Mannoni, *The Great Art of Light and Shadow: Archaeology of the Cinema*, 78. Mannoni does not go into further detail about this list, which is quoted as the cry of the travelling lanternist promoting his wares, but it is fair to assume that each of these names refers to a popular series of slides. For instance, the Seven Deadly Sins is described elsewhere as a popular lantern show, as is the Stations of the Cross (possibly "the Good Lord"). The "Hangman" could very well be a version of Kircher's "Grim Reaper" or Huygen's *Dance of Dead.*

morality tales that were fairly similar to Kircher's. Because these portable magic lanterns were physically strapped to the lanternist's body, the lantern became a physical extension of his body. When the lanternist enacted each tale live in front of his viewing audience, his bodily movements would mediate the projected image. When the lanternist moved, the size and placement of the image did as well. When the lanternist took a breath, the image shifted in relation to the movement of his/her chest. When the lanternist spoke, the image fluctuated with the rhythm of his/her voice. The performance of the projection was literally dependent on the performance of the lanternist. And the production of cinematic space was dependent on this dynamic performance. The audience, as much as the lanternist, mediated this performance space with their actions and bodies. In a reversal of the movie theatre, the lanternist, the "guest" in their home, would have to maneuver around the audience's natural environment, their bodies, their things, their constructs and desires.

1.4.3.3 Thought

Based on the examples of the magic lantern performances by Zahn, Kircher and Walgenstein, the act of projection had been culturally recognized since the seventeenth century, and, thus, the *act of projection* by the Lumière brothers at the Salon Indien would have not been a new or terrifying to the audience at that first film screening. However, projected *movement* (the illusion of continuous movement specifically) had also become popular with the advancements to the magic lantern in the eighteenth and nineteenth centuries. In the eighteenth century, mechanical slides became more popular as did detail-rich realistic images. The mechanical slides allowed the projectionist to create visual effects like "substitutions, disappearances, sudden apparitions, and continuous movement."[90] Physical humour was popular, (for example, lantern slides would show a person's nose rapidly growing, or an aristocrat loosing their wig), or feats of astonishment and visual

---

[90] Mannoni, *The Great Art of Light and Shadow: Archaeology of the Cinema*, 115.

attractions such as animations depicting tightrope walkers, or a spinning windmill.[91] The lanterns themselves were modified to obtain more powerful light sources, which allowed for a longer throw (the distance between the lantern and the screen) and stronger projected images. Multiple lanterns were used for to enhance viewing experiences by creating more intricate and complicated compositions for the audience. The popularity and variety of these magic lantern shows strongly suggest that historical accounts of the audience's reaction to the founding myth of cinema which depended on their naïveté, their shock at the sight of projected motion picture. Instead, the reaction is better understood, as Gunning asserts, as *performative*, based on the cultural practices of an informed audience.

Establishing the idea of cinematic space before the development of cinema is crucial step in my rehistoricization, for it allows an entirely different reading of not only that first screening, but also the importance of projection within the cinematic apparatus. Readings of cinema have become too cameracentric; looking at the projector, and defining cinema through the act of projection allows for an expanded history that incorporates *performativity* and *liveness*. Cinema's founding myth has been used to support cameracentric perspectives in film theory (where the recorded image takes precedence over the liveness of the performance). Mary Ann Doane, in her analysis of cinematic time, supports the idea that the theatrical space of early cinema was in fact a "boisterous, lively, sociable and interactive" space prior to the conceptual redesign of the theatre space (the architecture of the movie theatre which was set up to establish order and the primacy of the screen over the lived experience in the theatre through sloping floors, bolted stadium seating, and a culture of organized behavioural codes),[92] going so far as to suggest that the shift to cinematic space as disembodied was

---

[91] Ibid.
[92] Mary Ann Doane, *The Emergence of Cinematic Time* (Cambridge, Massachusetts: Harvard University Press, 2002), 132-133.

a direct result of the "dominance of the projected film's irreversible temporality."[93] What Doane means by the projected film's temporality is not the liveness of the act of projection, but the representation of time within the projected image, within the screen space. Emphasis on the two-dimensional screen space, the *visual* experience of cinema, diminished the lived experience within the theatre of the three-dimensional or *acoustic* dimension of cinema.[94] The cinematic space of the first film screening—that mythical event at the Salon Indien in 1895—was the same embodied cinematic space produced in magic lantern shows where the lanternist's body and the lived atmosphere of the setting were integral parts of the performance of the projected images. That is to say, not only did the practice of cinematic space exist prior to that first screening, but the projector, as a visible instrument, was a key performer in its production.

1.4.3.4 Moving Images in Magic Lantern Shows

The audience of that first projected film screening was accustomed to projection; perhaps it was the *movement* of the image that stirred the infamous reaction? Beyond the bodily movement of the lanternist and the portable lantern previously discussed, magic lantern slides were often animated. In the 1896 edition of *Modern Magic Lanterns*, Roger Child Bayley explicitly explains different ways motion picture was created through the use of the magic lantern slides. The first method Bayley describes is the "panoramic slide" in which a long vertical slide is artfully panned in

---

[93] Doane, 133.

[94] Here, again, I am referring to McLuhan's idea of acoustic space. For McLuhan, there were two ways of perceive the world: the first dominated by the eye, which he calls visual space, and the second dominated by the ear which he calls acoustic space. The eye possesses different characteristics than the other senses. While, touch, smell, sound and taste are, according to McLuhan, "totally discontinous, non-homogenous, and dynamic," sight was the reverse, "continous, connected, homogeneous, and static."[94] Visual space was characterized by the qualities of the eye: as linear, fragmenting, isolating, and disembodying. The eye alone has the ability to select that which it perceives, to block outs certain stimuli, and to zoom in on its visual prey. The linear and progressive quality of visual space is of particular importance to the study of screen space and the filmstrip—which both transpire in a linear, progressive and quantitative spacetime. Marshall McLuhan, *Understanding Me*, eds. Stephanie McLuhan and David Staines (Toronto, Ontario: McClelland and Stewart, 2003), 209.

front of the lantern by the lanternist. In order to avoid breakage of such long pieces of glass, Bayley suggests using "a roll of transparent film, bearing the picture, which is gradually wound off one roller to another, as in the photographic roll-holder."[95] Bayley describes the second method as "lever slides"—the same basic design that Huygens used where one piece of glass is fixed, and a second is movable by lever to animate the picture. Next, Bayley describes "slipping slides" where one piece of glass slides along in front of another (fixed) piece of glass, typically used in children's lanterns.[96] Martin Quigley Jr. describes a similar contraption, invented by Pieter van Musschebrook in the early eighteenth century: a double projection in one stationary slide and one moveable by pulling a cord.[97] Basic filter effects were commonly used to produce variation and visual intrigue over a single static image. Coloured filters could be placed directly onto the slide, or in front of the lens (allowing the projectionist to add and combine different colours at will (a method similar to the projectionist's colour performance that accompanies Barbara Rubin's 1963 masterpiece *Christmas on Earth*). Finally, there were the chromatypes, veritable kaleidoscopic images projected onto a wall:

> [T]wo circular glasses bearing geometrical designs are rotated in opposite directions while in the lantern. One design crossing the other in this way can be most effective, and it will be found difficult to realize what the combined result of any two geometric designs so revolving will be. Very fine patterns resembling "watered" silk can be got by mounting fabrics such as netting, muslin, etc., with a clear and well-defined tread, in such a revolving arrangement, taking care, to secure the best result, that the two fabrics shown together are similar.[98]

Various types of movement were not only possible with the magic lantern, prior to the invention of motion picture, but also popular, each possessing a liveness that the audience not only understood, but also advocated. The audience expected movement, as well as variations in the performances.

---

[95] Roger Child Bayley, *Modern Magic Lanterns* (London: L. Upcott Gill, 1896), 79.

[96] Ibid. Bayley's historization can be visually supplemented by looking at the Magic Lantern Society of Great Britain publication of an anthology of images, advertisements and descriptions of magic lanterns which is quite helpful in illustrating the mechanical aspects of these moving slides: Dennis Crompton, David Henry, Stephen Herbert, eds. *Magic Images: The Art of Hand-Painted and Photographic Lantern Slides (London: The Magic Lantern Society of Great Britain, 1990).*

[97] Martin Quigley Jr, *Magic Shadows* (Washington D.C.: Georgetown University Press, 1948), 70-71.

[98] Roger Child Bayley, *Modern Magic Lanterns*, 79-80.

These acts of projection were not limited to the visual realm. In 1877, still before the birth of motion picture, A.E. Dolbear describes live *acoustic* performances with the magic lantern that establish the projector-as-instrument, anticipating the audiovisual performances of Karl Lemieux, Bruce McClure, Sandra Gibson and Luis Recorder, and my own work with composer Stefan Tcherepnin (I will be discussing the performances of McClure and Lemieux at length in chapter 4). Dolbear describes how to "project" the vibrations of a tuning fork using a magic lantern:

> The vibrations of an ordinary tuning fork may be exhibited in the following way. Having made the fork to vibrate, hold it at *a* in the divergent beam and swing it in its plane of vibration at right angles to the beam of light. Its shadows will present a curious, fan-like appearance. If the fork is polished it will reflect enough light to exhibit the same appearance when looked at while vibrating and swinging.[99]

This experiment with light, shadow and vibration was not the only way the magic lantern could be used as a performative instrument. Dolbear also describes how to employ the magic lantern as a kaleidophone (as an instrument to visually represent soundwaves):

> To the end of a steel wire, two or three feet long, and an eighth of an inch in diameter, fasten with marine glue, or seal wax, a small bit of mirror, about the fourth of an inch square. The wire must be held tightly at some point, in a vice upon a table. The light from the *porte lumiere* [sic] falls upon the plane mirror, and is thence reflected upon the small mirror on the end of the wire, whence it is reflected to the screen. If the wire is now carefully plucked, it will give a line of light upon the screen, but will probably soon change into an ellipse or a circle. If it is struck with a small billet, like a hammer-handle, there will be heard two sounds, the fundamental with some overtones that will give a beautiful compound figure upon the screen, some circle or ellipse made up of small undulations, which will vary as the wire is struck in different places.[100]

Dolbear's description takes the magic lantern into a realm of performative instruments and corroborates one of Zielinski's more ambitious theories regarding the unification of audiovision media, that sound and image technology sound not be considered in separate categories, but along the same historical axis. While experimentation with the visualization of sound was in vogue throughout the nineteenth century (with the experiments of the Chladni plate and the manometric

---

[99] A.E. Dolbear, *The Art of Projection* (Boston: Lee and Shepard, Publishers, 1877), 58.
[100] Dolbear, 58-59.

flame as well as Helmholtz's revolutionary ideas on the materiality of sound), Dolbear is the first

author I have seen address the potential of the projector-as-instrument through the description of

his sound/image experiments (remembering that Dolbear first published T*he Art of Preojection* in

1877).

1.4.3.5 Photographic Images in Magic Lantern Shows

The popularity and ubiquity of the magic lantern as a moving image projector contradicts the

idea of the naïve audience proposed in the founding myth of cinema. Coupled with the fact that the

magic lantern could project *photographic images* from the mid nineteenth century, the notion of any

genuine fear on the part of the audience seems doubtful. The magic lantern projected photographic

images a half century before the Lumière's Cinématographe performance on that fateful night in

1895. In Great Britain, Sir J.F.W. Herschel took the first photographic images on lantern slides in

1839, and photographic lantern slides were available commercially in the 1840s.[101] In the United

States, William and Frederick Langenheim patented and began selling their version of the

photographic lantern slide—the Hyalotype—in 1850 which was showcased at the 1851 London

Exhibition.[102] These photographic slides were not a flash in the pan. One of Bayley's main

contentions in *Modern Magic Lanterns* (1896) is the decline in quality of the photographic images on

lantern slides in favour of the production of movement in magic lantern shows.[103] For there to be a

decline, there must first be an established practice.

Movement in magic lantern shows was not limited to the production of slides, nor to the

physical transportation of the lantern. The lantern itself was modified to allow for multiple

---

[101] Dennis Crompton, David Henry, Stephen Herbert, eds. *Magic Images: The Art of Hand-Painted and Photographic Lantern Slides* (London: The Magic Lantern Society of Great Britain, 1990): 38.

[102] Julius F. Sachse, "Philadelphia's Share in the Development of Photography," *The Journal for the Franklin Institute* 135, no. 4 (April, 1893): 283; Thomas Coulson, "Philadelphia and the Development of Motion Picture" *The Journal for the Franklin Institute* 262, no. 1 (July, 1956): 3-4.

[103] Roger Child Bayley, *Modern Magic Lanterns* (London: L. Upcott Gill, 1896), 79.

projections, similar to Kircher's early multiple projection experiments, yet focusing on transformation and movement. By the 1880s the biunial lantern (a magic lantern equipped with two independent lenses) was commonly used to produce the illusion of movement, often coupled with the projection of photographic images. With the biunial lantern, one could produce the effect of change in the physical environment of the photograph or image (adding rain or snow to an image, or changing a daytime image to night) and allow for sophisticated post-production techniques to be performed live, like dissolves, superimpositions, and cuts. Even after the introduction of cinema, these ornate magic lanterns were marks of prestige for any aristocratic home. The biunial projector was a vertical version of the horizontal dual-lens Phantasmagoria lantern, invented by Philip Carpenter in 1821.[104] The phantasmagoria, which combined state of the art projection with a spectacular theatrical experience, was an imperative gesture towards the liveness of projection and the idea of cinema as performative.

The popularity of cinema did not mean the death of the magic lantern. In the early twentieth century, magic lantern slides were still actively being made, especially amateur photographic slides. In 1901, Reverend F.C. Lambert published *Lantern Slide Making*, in which he painstakingly guides amateurs through the process of making their own cameras, taking and developing photographic slides, and performing any necessary post-production work (like hand-painting or cropping) to their images.[105] Even after the commercial establishment of motion picture through the development of a studio system and theatrical exhibition through networks of movie theatres (from around 1907 till the mid 1920s), magic lantern slides were used in conjunction with film projectors to advertize the products and services of movie theatres and promote upcoming movies (see figure 1.17). While the role of the magic lantern as an entertainment medium may have been displaced by cinema, they were

---

[104] Jordi Pons I Busquet, *Image Makers: From Shadow Theatre to Cinema* (Girona: Fundació Museu del Cinema-Col Iecció Tomàs Mallol, 2006), 63-65.

[105] Reverend F.C. Lambert, *Lantern Slide Making* (London: Hazell, Watson and Viney LTD, 1901).

not necessarily competitive products. Rather, the magic lantern, as a pre-cinema instrument crucial to the establishment of cinematic space, was used within the cinematic apparatus.

1.4.3.6 The Phantasmagoria

The last stop on this rehistoricizing of the projector's active role in cinema is at the phantasmagoria: spectacles composed of a mélange of aspects from theatre, photography, and cinema. Phantasmagorias were live theatrical events, which incorporated the magic lantern as a technology for projection of the impossible and/or imagined. Like the moving slides and multi-lens magic lanterns, what set phantasmagoria apart from early magic lantern shows was the use of movement and spectacle. Unlike the previously discussed iteration of projection (with the exception of Kircher's magic lantern shows), the key to the phantasmagoria lay in *concealing* the apparatus. In this regard, the phantasmagoria shares more with contemporary cinema practices than the first methods of exhibition, illustrated in the events of cinema's founding myth.

1.4.3.6.1 History

The phantasmagoria, although important in this rehistorizing of cinema around the projector, was not a new technology in itself. The name refers to an adapted practice of magic lantern practices that brought this technology into another artistic realm—the world of live theatre. The phantasmagoria was in essence a commercialization of the magic lantern show, an expansion of Walgenstein's magic lantern shows, and was primarily practiced by two key players, Paul Philidor and Etienne-Gaspard Robertson. What separated the phantasmagoria from past magic lantern shows was the complex narrative and theatrical aspect of the performances (these were plays in which the projection was a character), but also an emphasis on displacing the apparatus from the audience. Whereas in most magic lantern shows, the audience was aware of the apparatus (with

Kircher's sequestered lanterns being the exception), the phantasmagoria was dependent on the production of illusion, on the idea that the audience was not seeing a projection (i.e., the mechanical apparatus which carried with it the idea of reproduction and representation), but the actual spirits of the deceased (i.e., the character represented, the projection as an actor in the scene, rather than just the technology of representation). The magic lantern was put on wheels, so that the image it projected could appear to *move* both in size (by moving the lantern closer and farther away from the screen) and in position (by moving the lantern laterally along the screen). By the 1820s,[106] a new dual lens lantern was produced to allow for dissolves, cuts and more special effects (see figure 1.18).

There is a striking parallel in the description of the audience reaction to the early phantasmagoria and the audience reaction to cinema's founding myth. The naïveté of the audience and their horrified reaction to this technology has been stressed in historical accounts. As Mannoni writes:

> The pictures shown [in the phantasmagoria] were animated and mobile, appearing to rush towards a terrified audience who were certainly not used to such an assault of images. In addition, the macabre show devised around this new type of projection heightened the impression of unease and fear in the spectator. Most of the time, the walls of the room were draped in black. A gloomy silence, interrupted only by the metaphysical pronouncements of a stern "fantasmagore" master of ceremonies, or the lugubrious music of a "glass harmonica," would seem like the prelude to a veritable witches' Sabbath.[107]

The language used to describe the audience's reaction to the phantasmagoria mirrors that used to describe the reaction to the train effect experienced through the Cinématographe. The same excitement, the same rush, the same level of visceral engagement through visual perception was encountered in the event of the phantasmagoria as the cinema of attractions: only in the phantasmagoria, the mechanisms of the illusion were concealed from the audience.

---

[106] Mannoni suggests a later date, but Busquet states that the dual lens phantasmagoria lantern was made by Carpenter & Westly, after being invented by English Optician Philip Carpenter, in 1821. Jordi Pons I Busquet, *Image Makers: From Shadow Theatre to Cinema* (Girona: Fundació Museu del Cinema-Col Iecció Tomàs Mallol, 2006): 65.

[107] Mannoni (2000): 136.

In December 1792, Philidor opened his first phantasmagoria show at the Hôtel de Chartres in Paris. The show itself played off of themes of spiritualism and the occult. The audience in a darkened room would be presented with the "ghosts" of the recently deceased (typically recognizable public figures) and/or mythological creatures (like the devil, ghouls, etc.). Philidor created these ghostly apparitions through the use of a magic lantern, slides painted with the image of the ghosts, and the use of rear projections that ensured that the audience could not see the lantern. Without the visible presence of the magic lantern, the audience was to believe that these ghostly images simply appeared and disappeared from the ether. Although he did create a dramatic atmosphere for his performances, with the use of sounds, special effects and drama, Philidor's phantasmagoria shows were superseded by the massive spectaculars put on by Robertson, which employed the same tactics and explored the same themes as Philidor's with much more success.[108] In January 1798, Robertson opened his first phantasmagoria show in the Pavillon de L'Échiquier in Paris. His phantasmagoria shows ran until his death in 1837. Robertson studied the work of Philidor, as well as the writings of Porta and Zahn in order to produce the most effective and stirring illusions possible with his magic lantern. To substantiate his presentations, Roberston used a glass harmonica for the sound effects in his performances (an instrument with a macabre and morbid reputation, "forbidden in some towns, since the sound it emitted was supposed to be harmful to the health, being 'of such a weakening power to the nervous system of those who hear it, that it is impossible to bear its effect for more than a few minutes, without exposing oneself to going mad'").[109] During his forty years of public performances, a wide-ranging audience saw Robertson's phantasmagoria, as the spectacle was considered worth travelling to witness. The phantasmagorias produced by Philidor and Robertson emphasized narrative and the spectacular as well as the

---

[108] Mannoni, *Light and Movement: Incunabula of the Motion Picture*, 100-101.
[109] Mannoni, *The Great Art of Light and Shadow: Archaeology of the Cinema*, 151.

segregation and concealment of the mechanical apparatus in a manner unequivocally similar to the modern movie experience.

These terrifying shows were not without precedence, but differed in terms of how they were framed. As described by Mannoni, in the first generation of phantasmagoria (where the lantern was fixed in position) the macabre, the occult, and deadly apparitions were the main subjects presented. In the mid-to-late eighteenth century, Johann Schröpfer (deemed the "ghost creator") was using the magic lantern to produce images of the "recently departed" on sheets of textile and/or screens of smoke. Edmé-Gilles Gruyot used the same technique (projecting images on smoke).[110] This interest in projecting spiritualist iconography was part of the attraction of the phantasmagoria, but also echoed the unease with the photographic arts in general. Spiritualism was also rampant in still photography through the late nineteenth century. Séances and interest in the occult grew across Europe. R. Bruce Elder suggests that this interest in spiritualism can be linked to the development of abstract art, as a form of absolute art based on transcending representation and categorization in favor of absolute form and energy, and, as I will show in chapter 2, Arnaldo Ginna and Bruno Corra (the artists likely responsible for producing the first abstract film) were influenced by spiritualist philosophy. However, until Ginna and Corra's experiments with projector noise and abstract imagery, the magic lantern remained an instrument for mechanical *reproduction*. The movement of the projector was not used to create "new" elements, but lantern projections onto unconventional material continued into the early twentieth century.

1.4.3.6.2 Practice (as a projector)

While Robertson's last phantasmagoria show and the Lumière brothers' first projected cinema screening were separated by decades, moving image technologies continued to be a popular

---

[110] Mannoni, *Light and Movement: Incunabula of the Motion Picture*, 137-141.

form of mass media in that period. The last edifice of the phantasmagoria was the concealment of

the machine, which would be adopted in the practices of the peephole show and the proliferation of

rear projection. Emile Reynaud's Théâtre Optique (a cross between the magic lantern and the

Praxinoscope, insofar as the "moving image" was projector for a mass audience) hid the mechanics

of the technology from the audience through the use of rear projection (see figure 1.19). Many of

the optical toys popular in the mid-to-late nineteenth century (like the Praxinoscope, the

Phenakistoscope, the Zoetrope and the Zoopraxiscope) did not produce the idea of "living pictures"

to the masses through public projection, but did so through elaborate peephole and/or rear

projection set-ups displacing the audience from seeing the mechanism of the reproduction

technology. But perhaps the most proficient at taking attention away from the apparatus of

mechanical reproduction was the chronophotography of Marey, (who coined the term), and the

similar series of still images produced by Muybridge and Demeny. Chronophotography, a system of

photography that captured a succession of images rapidly in time also helped prepare the world for

moving pictures.[111] But the final product, a still photographic image exhibiting the movement of its

subject at different moments in time, in fact aided in the concealment of the apparatus insofar as the

subject matter and/or the aesthetics of end-product took precedence over the material process

undertaken to "capture" each image. And, of course, by the early 1890s, Edison launched his

Kinetoscope (a machine that allowed a single-person to view photographed images in motion),

technically the first device for photographic motion picture exhibition. The Kinetoscope was based

on the design of a peepshow, the mechanics of the medium were concealed within large wooden

---

[111] Many historians have provided excellent examples of the linage between these optical instruments of the nineteenth century and the birth of cinema: see Deac Rossell *Living Pictures: The Origins of the Movies (New York: State University Press, 1998),* Martin Quigley Jr, *Magic Shadows* (Washington D.C.: Georgetown University Press, 1948); Laurent Mannoni *The Great Art of Light and Shadow (Exeter, Devon: University of Exeter Press, 2000),* C.W Ceram (*New York: Harcourt, Brace & World, Inc, 1965), etc.

boxes; through a peephole; the lone observer could see only the representation of the moving image, not the mechanical apparatuses that produced the image (see figure 1.20).

A few other practices took the phantasmagoria's production of cinematic space while concealing the projector to the next level by removing the projector and projection completely: that of themed nightclub interactive performances, as well as the panorama and the diorama which became popular in the late nineteenth century. As early proto-expanded cinema practices that also depended on the established idea of a cinematic space that concealed the mechanisms of production, these events involved creating quasi-immersive, sensational experiences, within which the audience had an active role—experiences like those produced on amusement park rides that are at once simulated and exciting (i.e., safe environments in which we can experience dangerous physical thrills). Most specifically indexical of the phantasmagoria, Paris housed the Cabaret de Néant (a bar/theatre where coffins doubled as tables, waiters dressed as pallbearers, and customers were asked to "choose their poison"). Customers were then lead into a small room (the *chambre de la mort*) where the group was barraged with a deluge of noises such as the sound of chains, eerie squeaks and ghastly creaks. Then, a projection of a pretty "dead" girl would emerge from inside an upright coffin; within a few seconds, this apparition would seemingly melt away, being replaced by the image of a prosperous banker. Within a few second, his image would seemingly melt into another, and so on.[112] The apparitions were likely produced using a multiple lens magic lantern, not a film projector, but the overall sensational effect was the same. This type of performance was typical of a rise in popularity of interactive performances, also marked by Oscar Méténier, who staged his famous "*opus grossus*" in 1897. The play was set in a tiny theater in order to engender a feeling of claustrophobia in the audience. Patrons were met at the door by a physician (or someone dressed as a physician), who warned them of the potential of cardiac arrest if they entered the theatre. And, before gaining

---

[112] Marvin Heard, *Phantasmagoria: the Secret Life of the Magic Lantern* (Hastings: The Projection Box, 2006), 251-254.

94

entrance, audience members were forced to sign a written agreement absolving the theatre of any

responsibility if they were to die during the show because of fright. These tropes were meant to

promote the performance, to cause a stir and generate word-of-mouth support. The performance

itself was a disorienting comedy/horror, which was extremely successfully, running until 1962.[113]

The popularity of the phantasmagoria lead to an increase in the production of immersion

spaces as entertainment and the development of another form of proto-expanded cinema that not

only concealed the role of the projector but displaced projection entirely. Founded in the practice of

painting, the panorama, like the phantasmagoria, aimed to produce a cinematic space that held its

audience captivated. Large format screens completely covered in painted images (sometimes

produced through rear projection, others more traditional paintings on canvas which were often

traced from a projection) were often formed into semi-circles or circles into which the audience was

positioned. These screens were used to transform the space into a particular foreign or historical

moment or place. The screens sometimes moved, or, in the case of rear projection, contained

changing imagery. Grau suggests that the panorama and diorama are a type of immersive space that

can be though of as a virtual reality, but distinct insofar as there was no potential for creative process

within these idealized settings (i.e., based in illusion, not immersion). Within this paradigm, the

panorama and diorama both transport the audience *elsewhere*, but to an elsewhere without

authenticity and without any connection to the production of that imagined space. As Grau states

about the panorama specifically, "once inside, *once in the picture*, the sense impression of a distant

work, separated from the observer, disappeared. In the homogeneous image space, everything was

the work."[114] Grau's description of the panorama, I would argue, is just as apt in describing

commercial Hollywood cinema where the audience experience, ideally, is framed in a way that their

---

[113] Heard, 248.
[114] Oliver Grau, *Virtual Art: From Illusion to Immersion* (Cambridge, Massachusetts: The MIT Press, 2003), 127.

physical environment is secondary to illusionary reality presented on the screen. But I would stress that the ability to experience this illusionary space was only possible through the concealment of the apparatus, which provided the means for a dialectical tension between the lived body and the imagined elsewhere.

Crary distinguishes the panorama and the diorama based on their proscribed experiences of the audience (i.e., their personal agency). Within the panorama, while the images were often static, the observer was mobile and could move through the engendered space (either by moving his/her body around the area or, at the very least, shifting his/her eyes). This meant that the audience had a more active role in mediating the experience. By contrast, the diorama was "based on the incorporation of an *immobile* observer into a mechanical apparatus and a subjection to a predesigned temporal unfolding of optical experience."[115] The observer became a part or component in the much larger apparatus; the audience was stationary, locked into position, while the performative aspects of the diorama unfolded around them. Yet, the diorama did engender active audience participation insofar as they interacted with each other and the material presented to them in much the same manner as Gunning describes the reaction to the cinema of attractions, yelling, laughing, creating a networking system from which the material was internalized. The audience also was not always immobilized, insofar as in certain environments, the audience could walk around and navigate their own experience of the synthetic environment. By the 20th century, dioramas were incorporating film projection with the reconstruction of dangerous, exciting and/or foreign environments. For instance, Raoul Grimoin Sanson's *Ballon Cinéorama*, built and displayed for the 1900 World Exhibition in Paris, took its audience on a hot air balloon ride. The audience was positioned inside of a hot air balloon basket (which was attached to a platform), with a full hot air balloon above them. While confined to that specific space (which they would be anyway inside a "real" hot air

---

[115] Crary, *Techniques of the Observer*, 112-113.

balloon), the audience would move about and interact with each other. The simulacrum was completed by projecting (through ten film projectors positioned on the platform under the basket) a panoramic view of a cityscape, growing ever more distant as the hot air balloon gained flight. The audience had a decisive role in determining the order in which they observed the simulation (based on their position and movement through the basket). Through this combination of film and sensory immersion, coupled with the production and displacement of space, the *Ballon Cinéorama* was truly one of the first examples of expanded cinema as well as an important mechanical device linking diorama and cinema. Moreover, the *Ballon Cinéorama* exemplified the performative role of the projector, insofar as it was the projected images of the increasingly distant landscape that completed the illusory experience for the audience—projectors that were unseen, hidden from conscious awareness of the audience.

Another diorama at 1900 Paris Exposition is of interest to my exploration of the cinema's founding myth. Directed by Pawel Yakoclevich Pyasetsky, *The Great Siberian Route: The Main Trans-Siberian Railway* was commissioned by the Compagnie Internationale des Wagons Lits to recreate the experience of a voyage on the Trans-Siberian Railway. The audience, although confined to a stationary train-car, was met with the sounds and simulated experiences of the actual journey between Moscow and Peking. Regardless of the mechanical, technical and/or artistic features of the panorama, the audience had the final role of *imagining* the experience, not as a virtual reality but a performative gesture within their (the audience's) existing embodied space. The design of the simulated experience focused on the train, in much the same way as *L'Arrivée d'un train en gare de la Ciotat*. Trains, planes, hot air balloons and automobiles, technologies of transportation and displacement were all popular themes of early cinema and cinematic practices, for, as previously discussed earlier in this chapter, they transformed our perception of the world (by shifting our concept of space and time, by eliminating physical distance and projecting through past into the

97

future). While the *The Great Siberian Route: The Main Trans-Siberian Railway* and the *Ballon Cinéorama* both engendered cinematic spaces without (or while concealing the role of) the projector, they did so without deflecting from the experience of the lived body (however artificial) within that imagined space. In this sense, the cinematic space of the diorama and the panorama had the potential for a more embodied experience because of their performative and/or process-based nature of engagement with the audience.

1.4.3.6.3 Thought

With the phantasmagoria, as a technology based on illusion, came issues of authenticity and representation. Walter Benjamin's theorizing of the phantasmagoria conceives of the magic lantern technology as an ideological apparatus. Benjamin uses the phantasmagoria as "a figural image of the world of urban commodity capitalism" insofar as it represented "the powerful and deeply illusory quality of this environment, a characteristic that has a debilitating effect upon the human ability to come to rational decisions—and in fact to perceive and understand the world." [116] This interpretation of the technology, like the founding myth of cinema, assumes that technology is engendered in an illusionary space in which the audience was objectified within the illusion. For Benjamin, the audience is made of *flâneurs*; the cinematic screen space is the department store window (i.e., the site where the *flâneur's* "fantasies were materialized"). [117] Benjamin's theory of the phantasmagoria and its socio-technological practice highlight one important aspect which differentiates the phantasmagoric space from the previously discussed embodied cinematic space produced in my examples of the magic lantern, the telescope and the *camera obscura*: the concealment

---

[116] Michael W. Jennings, "The Production, Reproduction, and Reception of the Work of Art," in *The Work of Art in the Age of Its Technological Reproducibility and Other Writings on Media*, eds. Michael William Jennings, Brigid Doherty and Thomas Y. Levin (Cambridge, Massachusetts: Harvard University Press, 2008), 11.

[117] Walter Benjamin, *Arcades Project*, ed. Rolf Tiedermann, trans. Howard Eiland and Kevin McLaughlin (Cambridge, Massachusetts: Harvard University Press, 1999), 895.

of the projector. By removing the visual index of the cinematic apparatus from the live performance, the dominance of the illusion was given agency over the lived experience of the audience, which, in effect, operates under the same rubric as contemporary commercial cinema in cinemaplexes.

The history of the projected arts, however, extends beyond this definition. As this chapter shows, early projected arts were used to explore ideas of subjectivity and objectivity and the tension between inner and outer worlds. In this early pre-cinema history, the projector was often included in theatrical and/or social spaces. The examples of cinema produced by artists at periods of transition within the projector's history differ in this sense from dominant commercial narrative cinema. These artistic uses incorporate the projector's noise into the experience of cinema so as to highlight the *performativity* of the instrument, and engender *liveness* in the experience of cinema. The following three chapters will draw attention to cinema as an immersive and embodied space. Benjamin's view of the phantasmagoria as the producer of fetish commodities does not pertain to my understanding of cinema and/or use of the projector as instrument (a use more closely associated with the history of projection technologies explored in this chapter: the *camera obscura*, the telescope and the magic lantern). What Benjamin misses in his analysis (as do Crary and Doane) is the role of the projector as a material object in this setup. The phantasmagoria differs from the earlier iterations of the magic lantern shows in that the projector (and its labour) is concealed—something that is *not* practiced by the artists to be discussed in the next three chapters. Most of the portable magic lanterns were not only present to the audience during the show, but also were physically strapped to the projectionist's body throughout the show. While there was a level of *performativity* present in phantasmagoria, insofar as the projector was mobile and had an active role in the production of content, its function as an *actor* depended on its invisibility to the audience—quite the opposite of earlier performative

practices and the specific artistic examples to be discussed. The concealment and silencing of the machine was an important part of the production of cinema as an illusory space.

The second step in establishing cinema as illusory space was the removal of the lived body of the audience from the experience. This was partly achieved through the concealment of the apparatus, and partly through the inflated emphasis on a fetishized imaginary on the screen. The materiality of cinema, in this process, was taken out of the equation on a material level, as the apparatus was physically removed from the audience's experience, and on a psychological level, as the acknowledgement of the apparatus would hinder the state of suspended disbelief. Cinema became not only immaterial, but this immateriality was supported by illusion. The concealment of the projector and of the projector's noises from the audience allowed for an imagined distance between the lived experience of the fantasy of the cinematic event; the lived body (of the projector and of the audience) was removed from the visual experience of the work. As argued throughout this dissertation, embodiment in cinematic space is dependent on the dialectical tension between the lived body and the imagined screen content. Without the lived body in this equation, cinematic space becomes a virtual reality where the *idea* of materially takes precedence over perception.

1.5 Capturing a Train of Thought

In the first projected film screening, on that late-December night in 1895, the projector was present in the room. In fact, it was at the front of the room, in front of the audience, clearly positioned for all to see. While the concealment of the projector and its noises affected the spatial and temporal experience of the film, the first screening made no effort to disguise the apparatus. The Cinématographe, instead, took centre stage. No music or sound was used to mask the projector's noises, or "add" to the screen content. The projector's noises marked the performance, marked the liveness of the event taking place before the audience. What was heard by the audience,

and what was seen on the screen was on account of the projector's noises: the audible "kaaaaaaaahhhh-chhhhhhiiii-kaaaaaaaahhhh-chhhhhhiiiiii-kaaaaaaaahhhh-chhhhhhiiiii" of the hand-crank, and the visual flickering image run at approximately 16 frames per second.[118]

The use of the train in cinema's founding myth may very well have been inspired by the projector's noises. In their seminal work *Composing for the Film*, Adorno and Eisler suggest that musical accompaniment in silent cinema was a result of the ideological implications of the projector's noises. In their analysis of film music, Adorno and Eisler state that live music became the standard requirement for silent film because of "the painful noise [of the projector] disturbed visual enjoyment to no small extent."[119] The enjoyment of the moving picture, they suggest, was compromised by the noise of the projector. But Adorno and Eisler demanded a more thorough analysis of why the noisiness of the projector to the early cinema audiences was considered "unpleasant," and why "the grating, whirling sound actually had to be 'neutralized,' 'appeased,' not merely muted."[120] No such research has been completed. However, in their own brief analysis, the authors suggest that tension between the noisiness of the projector and the muted human apparitions projected on the screen made the audience aware of "being a helpless inarticulate mass given over to the power of a mechanism."[121] The projector's noises muted the audience's sense of subjectivity, their voice in both the screen space (the voices of the subjects in the film, with whom the audience was to identify) and in the physical environment (as overpowered by the noisiness of

---

[118] At the time of this first screening, standardized projection and/or recording speeds were not yet set. However, the standard speed of hand-crank projectors was around 16 frames per second from the beginning of the twentieth century. The speed of the film was entirely dependent on how quickly the cameraperson cranked the camera. The projectionist was granted a similar freedom, insofar as the filmstrip could be run at any variable speed, but had to try to modify his/her movement to that used for the original inscription. In the case of the first screening, Louis Lumière had shot the film, likely on the same machine he was using to project it. His timing was likely pretty well synced.

[119] Here, Adorno and Eisler, employ the words of Kurt London, who originally stated the same thing in his seminal text *Film Music* (London: Faber and Faber, 1936), quoted here from Adorno and Eisler, *Composing for the Films* (New York: Continuum, 2007), 126.

[120] Ibid., 126.

[121] Ibid.

the projector and by the process of identification with the screen content). That first film screening, from which cinema's founding myth has been built, was a silent screening.

The apparition of a speedy and seemingly uncontrolled train would enhance this feeling of powerlessness and subjugation to the machine especially since, as previously mentioned, the projector's noises were reminiscent of the train's noises. In the nearly silent room, the "kaaaaaaaahhhh-chhhhhhiiii-kaaaaaaaahhhh-chhhhhhiiiiii-kaaaaaaaahhhh-chhhhhhiiiii" of the hand-cranked projector took on the voice of the train. The noises of the projector and the train are very similar, much more so than the projector and the automobile or the airplane, which may help to explain why the founding myth was built around a train film. While the human apparitions were muted, the train was given voice. The projector's noises, therefore, could be seen as a diegetic link between the screen space of the projected image and the embodied space of the theatre. The mechanical noise, according to Karin Bijterveld, was "too fast and fixed for human rhythms" and thus took on a chaotic, confusing, and deafening quality to the human ear.[122] Referring back to the writings of Stanley Rowland, Bijterveld suggest that the difference between what was defined as "noisy" and "not noisy" was that "between self-possession and self-assertion."[123] Echoing Adorno and Eisler, the inability of the audience to control the projector's noises therefore became linked to their own loss of power over their ability to subjectively possess their identity.

While the sociopolitical analysis of Adorno and Eisler, and Bijtervald provide an interesting argument for the projector's noises as disruptive and/or requiring to be concealed, they miss the creative potential of this noise in the production of embodied cinematic space. Noise produces a rhythm. Mechanical noise is part of that rhythm.[124] The noisiness of the projector, when in the same

---

[122] Karin Bijsterveld, *Mechanical Sound: Technology, Culture, and Public Problems of Noise in the Twentieth Century* (Cambridge Massachusetts: The MIT Press, 2008), 83.

[123] Karin Bijsterveld, 96.

[124] As previously mentioned, Lefebvre, in *Rhythmanalysis*, suggests that mechanical movement is not a rhythm, because it has no natural pattern (rhythm being a product of nature and social production). However,

physical space as the audience, resonates through the lived body of the observer who is reminded of that persona of their physical presence inside the theatre space. As such, the projector is the key instrument in creating the dialectical tension between the lived experience and the imagined experience of cinema necessary for an immersive space. The audience's awareness of the projector, their experience of the projector's labour in "playing" the filmstrip (which provided a conscious understanding of *liveness* in performance of the film), provided spatial and temporal environments in which the audience became an active participant in the production of cinematic space.

Insofar as Adorno and Eisler's theory of film music centres on voice (i.e., on film as representing diegetic, narrative and/or language-based screen space), their observations on the projector's noises fit into screen-content/cameracentric discourse. Their emphasis on screen space serves to reinforce the idea that within cinematic space the audience is captured in a time machine, where the historical representation (of a necessarily past event re-presented on the screen) takes precedence over the lived experience and presence of the body in the space of the theatre. In short, the duo did not consider cinema as a performative art, nor the performative gestures of the projector as an instrument. The noisiness of the projector, if the emphasis is on the imaginary space of the screen content, necessarily interferes with the transmission of the message (if, again, that message is caught within the screen and has nothing to do with the lived experience *in* the theatre). However, the noisiness of the projector, if included in understanding the performance of the film, engendered this embodied experience of cinematic space.

---

in the same text, he later discusses the rhythm of traffic, and while he is referring specifically to the socio-technological patterns of traffic, the noises of the cars are part of that rhythm. I would suggest that the projector's noises are part of the larger rhythm of cinema, in the same sense as the visual tempo of the projector's movement (the 24 frame per second pulse of cinema) provides a base visual rhythm from which other patterns can be discerned. For an example of creative potential of mechanical rhythm, I would point to the work of Peter Kubelka (discussed in chapter 3) who uses the base rhythm of the projector as a metronome for his visual and acoustic compositions, and Lars von Trier's literal depiction of the mechanical rhythm of machines in *Dancer in the Dark* (2003).

This spatio-temporal tension of cinema may also provide insight into the formulation of cienma's founding myth around a train film. To me, while the acoustic experience of the first film screening should be considered as important as the visual (and the projector's noise is closely reminiscent of a train), the train represent a larger sociopolitical shift in the landscape of western society insofar as mechanization and industrialization practices were actively changing the way humans related to and produced space. Cinema, as a projected art, had a role in the shift from Cartesian perspectivalism to Euclidean space (a transition that Lefebvre times at 1910, but is highly motivated by the Bergsonian concept of duration[125] and this new understanding of the space time continuum provided through socio-technological innovation at the end of the nineteenth century).[126] As discussed by James Carey and Harold Innis, the institution of railroad networks across continents led not only to an enlarged socioeconomic infrastructure, but also changed our perception of time and space. The railroad brought with it commerce, travel, an enhanced sense of nationalism and standardized time, which facilitated industrial globalization, commodity capitalism and the move towards urbanization. The primary byproduct of this ideological shift was noise. As supported by Karin Bijterveld's empirical study on the history of noise abatement, the idea of noise as troublesome was a modern, urban and industrial phenomenon, centered on not only the mechanical noises of the factory and new machines, but also the steep divide between personal and public

---

[125] Bergson's concept of duration has been considered revolutionary insofar as, in contrast to Kant, Bergson considers time to be heterogenous rather than homeogeneous. According to Bergson, we experience time as either discrete or continuous multiplicities. As he states: "Pure duration is the form which the succession of our conscious states assume when our ego lets itself *live*, when it refrains from separating its present state from its former state" (Henri Bergson, "The Idea of Duration" in *Henri Bergson: Key Writings*, ed. John Mullarkey [New York: Continuum, 2002], 60). For Bergson, duration was linked to our psychic conception of the continuous and simultaneous, i.e., "that the mental image thus shaped implies the perception, no longer successive, but simultaneous, of a *before* and *after*, and that it would be a contradiction to suppose a succession which was only a succession, and which nevertheless was contained in one and the same instant" (Ibid.).

[126] Lefebvre discusses the importance of the period around 1910 as the moment of rupture of Euclidian space in the first chapter of his book *The Production of Space*, but specifically in section XI (Henri Lefebvre, *The Production of Space*, trans. Donald Nicholson-Smith [1974; repr. Malden, Massacuhusetts: Blackwell Publishing, 1991], 25).

spaces. For example, the noise of neighbors was as much of a concern in the early twentieth century as the noise of traffic, airplanes or trains. In this sense, the projector's noises also indicated a socio-technological space of transition insofar as the cinematic apparatus marked this same condensation of time and space as industrialization (i.e., factory machines, whistles, etc) and technologies of transportation (i.e., the train, the automobile, etc.).

The train provided the same spatio-temporal tension as that experienced in cinematic space. Aboard the train, the rider was engaged in a simultaneous sense of "being here" and "being there." The lived body in the space of the train car could be described as in a state of temporal stasis, waiting to arrive at a destination, an imagined location in much the same way as the lived body of the audience in the theatre encounters the imagined screen content at the expense of their lived temporal experience. This temporal dimension, the relentless progression of the machine edified in its unremitting noises, also links the train and the projector. Like the projector, the train was "a clock without hands" that continuously pushed forward, adhering to the dominance of a linear experience of mechanical time over the more cyclical rhythms in nature. That relentless progression translated into an experience of space, insofar as the train kept a schedule, based on the standardization of abstract time, running a network system that presupposed human activity (i.e., we have to conform to its schedule). And, in cinema's founding myth, that relentless progress of the train marked by the noise of the projector threatened to embark off the screen space and into the embodied cinematic space of the theatre. Certainly part of the reasoning for centering the myth around *L'Arrivée d'un train en gare de la Ciotat* (1896) was aesthetic: the perspective in *L'Arrivée d'un train en gare de la Ciotat* produced a much more powerful *trompe l'oeil* effect (that Gunning aligned to cinema of attractions) because the movement of the train in relation to the camera appeared, almost in 3D, to jump off the screen. Like Gunning, Bottomore suggests that train films were treated with reverence because they inherently produced a sense of visual excitement, but that the myth was exaggerated to help

publicize the new medium of "cinema." My hypothesis, unlike Gunning and Bottomore, hinges on the relationship between the train and the projector's noises in producing a spatio-temporal experience within which the audience could participate in an immersive performance.

1.6 Conclusion

The goal of this chapter was to establish that the projector, as an instrument for the production of space, had a history prior to its role in cinema. Through a media archaeology of the projector, I have established that not only did the technology precede cinema, but also that through the use of the projector cinematic space (as embodied and performative) also predated the conventional origins of the medium. The media archaeology presented in this chapter serves to set up the next goal of this dissertation, as explored in the following three chapters: to investigate the use of the projector's noises in the production of an immersive and embodied cinematic space, at three transitional periods in cinema. The three moments of technological transition, which inspired equally progressive uses of the projector are: 1) the development of the intermittent mechanism or Geneva drive around 1907; 2) the development of sound-on-film technology (around 1928); and 3) the digital transition in commercial cinema (around 2012). Each of these moments allowed for a renewed engagement with the technology of projection, in which the projector was used as a performance instrument. Focusing on the projector-as-instrument necessarily engenders a *liveness* to the experience of cinema, but in the next three chapters, I will explore how artists have evoked this liveness to produce the dialectical tension described by Grau and Sobchack (as active and participatory), in contrast to the dominant normative experience of cinema (as passive and suppressive).

Chapter 2

On the Origins of the Projector-as-noise-instrument: The Italian Futurists, of the Cinématographe and *Intonarumori*

2.1 Introduction

     In the first chapter of this dissertation, I re-presented a history of cinema—one based on the projector rather than the camera—in order to argue for the importance of this nonhuman actor in the production of cinematic space and as a means of approaching cinema as an expressive, rather than inscriptive, medium. This chapter extends these ideas by focusing on how the projector was a dynamic and productive instrument for creative expression in the early years of cinema before the development of sound-on-film technology. Through an analysis of the projector's body and a consideration of its mechanical body's noise results from of its labor, I will explore how the projector's noises extend the cinematic apparatus beyond the visual space of the screen which, as discussed in the previous chapter, is based on an abstract concept of space as a mental activity without any basis in our bodily experience, and into the realm of acoustic space where the film is experienced by the observer as a multi-dimensional, multi-sensory phenomenon forged by the continuous interplay between figure and ground. Within this acoustic space, emphasis is placed on the *liveness* of the cinematic experience insofar as the performance of the cinematic apparatus grounds the observer in the immediacy of the bodily encounter. While the previous chapter illustrated how the noisiness of the projector had been conceived of as problematic in relation to the experience of cinema, this chapter will instead focus on how the projector inspired avant-garde artists to reconceive cinematic space as a live, productive realm of experience, where the projector assumes the role of a noise-instrument—a nonhuman actor charged with a dynamic expressive force that inherently places the observer in the spacetime of the here-and-now. Finally, in this chapter, I will establish how the use of the projector by the avant-garde in the early twentieth century as a *noise-*

instrument marked a shift in the conception of music; that the noises of the projector, when conceived of as a instrument for production (not simply as a machine for reproduction) allowed for, I will argue, the beginnings of an *art* of noises. Within this analysis lies an understanding of the distinct role of the projector within the history/conception of abstract art, and aims to serve as an invitation for further study into the cultural significance of the projector.

In order to develop these ideas, this chapter will concentrate on the work of the Italian Futurists, the first group of artists to explore cinema-as-art. This chapter will begin with the analysis of projector-based cinema by looking at the early cinematic work of Arnaldo and Bruno Ginanni-Corradini, two young Italian artists (and brothers) that would later join Filippo Tommaso Marinetti's Futurists movement (under the pseudonyms Arnaldo Ginna and Bruno Corra). This section will examine the brothers' use of visual noise in their early abstract films through the performance of the projector. The next section of this chapter will discuss the Futurists' contentious relationship with cinema and the photographic arts—Futurist cinema was not created until 1916, a full seven years after the group's inception and two decades after the birth of film—in order to explain how their interest in cinema developed only after the concepts of *performativity* and *liveness* through the projector's noise were applied to cinema. This section will address the reservations held by Umberto Boccioni, long felt to be the intellectual leader of the first-wave Futurism, towards the photographic arts, paying particular attention to the concept of duration and looking at how the focus on the projector challenges his anti-cinema doctrine. Lastly, this chapter will look at how the projector's noise was instrumental to the development of one of the Futurists most progressive inventions—Luigi Russolo's *intonarumori*—insofar as the mechanics of his instruments mirrored the design of the projector, demanded a similar new negotiation of space, and emphasized the original and extraordinary noises of the machine.

The noisiness of the projector—that material noise innately produced by its body—affects the spatialized experience of the work of art. By constantly locating the observer's body within the space of the theatre (the lived space), the acoustic noise of the projector called out the disjunction in the observer's live, bodily experience and imagined physicality presented in the screen content. Sequestered in the projection booth, the noise of the machine, its heartbeat pounding, the noise of its constantly progressive "pulling forward" never reaches the body of the observer sitting in the darkened theatre. Despite this silencing, the pulse of the machine was still *felt* by its audience (as an absence of sort) through the visual movement of the light beam cutting through the darkened theatre and hitting the screen.[127] The mechanical movement of the projector is also felt through the presentation of time, best exemplified in the bifurcation between film and video exhibition. Film and video *look* different, less so because of any resolution and/or inscription difference, but because of their different frame rates—the rhythm of the frames—in time. And when the noisiness of the projector—the mechanical pulse of the apparatus itself—was in the same room as the cinematic observer, it gave depth to the experience of film by bringing forth the dialectical tension between the ethereal projected images and the materiality of one's body within this spacetime-shifting environment. Russolo's machines, similarly, cut through conceptions of space, of the private and the public, and redefined what was considered "musical."

This chapter introduces the performative aspects of the projector by focusing on the observer's relation to the noisiness of the projector that, on one hand, locates the observer within

---

[127]In the early days of cinema projection, when the projector was hand-cranked by the projectionist, the most difficult part of the projectionist's duties was to match and maintain the speed of the film's movement to that of the camera operator. Any slight variations were instantly apparent to the audience. With the standardization of sound-on-film technology, and the invention of the electric projector, film (regardless of gauge) has primarily been exhibited at 24-frames per second. In North America, NTSC video, conversely is typically shown at 29.97-frames per second (in order to comply with the standardized 120 Volt 60 Hz electrical distribution). In order to *feel* more like film, to make the digital transition more expedient in movie theatres, D-cinema typically exhibits video 24 frames per second. In Europe, PAL and SECAM both operate at 25-frames per second, based on the 50 Hz eletrica distribution system—much closer to the 24-frame per second film format.

the performance space of the projection, and, on the other, "plays" with intended meaning of the message as a productive, live and dynamic form of communication and a means of revolt against the narrative structures that ruled over language and space.[128] As such, this chapter further develops my larger argument positing that the noisiness of the projector disrupted linear, direct, narrative reading in screen space—the figurative space in which the fantasy of film lives—because the observers were perpetually aware of their presence in the lived space of the theatre, revealing the cinematic experience to be one of dialectical tension. In other words, film as a specifically *visual* experience was disrupted by the grounding noise of the projector. The projector thus determines the way that an audience experiences and gives meaning to a film, regardless of the film genre. The mechanical noise of the projector, the heartbeat of the apparatus, generates a repetitive measure, that, in conjunction with the other beats, breaths, tones, pulses, movements and sounds in the particular environment, creates a rhythm that gives life to that space and engenders a multilayered cinematic experience. In this sense, the projector had a very active, generative and creative role in the production of cinematic space.

In early cinema, the transition from considering the projector as a mechanism for reproduction to a technology for "productive creation" (borrowing the term from László Moholy-Nagy, in reference to the productive/artistic uses of the gramophone) would not have required a huge leap. It was likely a much more obvious function of the projector for those living in the late nineteenth century and early twentieth century than for us today. As explored in chapter 1, the Lumière Cinématographe, which was the design that inspired most motion picture cameras and

---

[128] The theories of Hélène Cixous and Julia Kristeva on mutually constituting relations between the author and reader (or artist and audience) inform this idea of revolutionary nature of an active cinema audience in the production of meaning and this negotiation of cinematic space. Marinetti was similarly interested in the sensations of the observer in relation to, and as an active actor in, the production of meaning.

projectors in Europe during the period to be discussed in this chapter (between 1909 and 1916),[129] was at once a camera *and* a projector, thereby conflating the site of cinematic inscription and expression. The division of labor between inscription and expression only occurred after the institutionalization of cinema when the projector became a fixed, immobilized entity within the theatrical space, and the camera became larger with a more elaborate design to allow for longer lengths of motion picture. The act of projection during this introductory period of cinema (a much shorter window than typically imagined, as motorized 35mm machines were being advertized and becoming popular by 1912)[130] was also mediated by the projectionist's body, which controlled the tempo of the motion through the speed at which he/she turned the crank. The speed of the motion picture was dependent on the projectionist's engagement with the machine. And while professional projectionists speed may have been fairly consistent, the tempo of film was not standardized until projectors were motorized, out of technical necessity, with the proliferation of sound film in the late 1920s and early 1930s.[131] Until then, especially when the projector was presented in the space of the observer, there was a liveness (aliveness) to the cinematic experience, to the performance of film, very different from that of the contemporary movie theatre. And, in this sense, all presentation of film, then and now, can be considered a live performance, that is not a representation or

---

[129] The start date for the analysis in this chapter is based on 1) the beginnings of unified and outspoken avant-garde art groups in Italy, including Marinetti's Futurist movement, and smaller independent avant-garde art movements around Italy whose members would later join the Futurists, but also on the date Ginna and Corra started thinking about experimenting with film. This date is somewhat contested. Lista suggests that Ginna and Corra began their experiments in 1910, after publishing *Arte dell'avvenire* (Giovanni Lista, *Le cinema futuriste* (Paris: Éditions Paris Experimental, 2008), 19-20). In the manifesto "Abstract Cinema—Chromatic Music, " Corra, suggests that he and his brother had been experimenting with the technology before producing abstract film in 1910 (no longer just testing the potential of the projector as instrument for their chromatic music, which suggests that they began their experimentation earlier) (Bruno Corra, "Abstract Cinema—Chromatic Music" in *Futurist Manifestos*, ed. Umbro Apollnio (New York: The Viking Press, 1970), 66). I have, therefore, chosen 1909 as a starting point, although it is likely that no *public* performances of the brothers' cinematic works were seen until 1910.

[130] Advertisements for motorized 35mm projectors are featured prominently in *Moving Picture World* starting around 1910-1912.

[131] Although, even motorized machines vary slightly in speed, depending on their own internal network of (mechanical) communication/interaction. One loose belt could affect the speed at which a film is projected.

reproduction of a past event, but a *productive creation* happening in real time, where the projected image becomes the product of "playing" the projector.

For Bruno Corra and Arnaldo Ginna[132] it was precisely this potential for productive creation—this liveness—of the early projector that inspired their experiments with the cinematic medium. The brothers viewed the projector as an instrument for the production of a new art form, which they termed "abstract cinema—chromatic music." For the brothers, cinema—through the projector—represented a means of combining the "chromatic harmony" possible through abstract painting with what they termed "chromatic motif" and/or "chromatic theme" achievable through "the mingling of chromatic tones presented to the eye successively."[133] While the noisiness of their instrument may not have directly interested the brothers, in this chapter I will delineate how it may have nonetheless influenced the birth of noise music through one of their most famous (albeit critical) observers—a young Luigi Russolo, who met the brothers to discuss their artistic theories and experiments in 1912, a year before he wrote his renowned manifesto "The Art of Noises." Russolo was equally invested in the liveness of the performance of noise, and the mediation of noise through bodily engagement with his *intonarumori*, or noise instruments.

The goals of this chapter are ambitious, and will require somewhat of a leap of faith since many of the technologies and/or artworks I will be discussing were destroyed through natural deterioration over the years, and/or were victims of the two world wars. As such, the chapter demands media archaeology as its formal methodology—for it is necessary to *imagine* the material

---

[132] Ginna and Corra changed their names from Arnaldo and Bruno Ginanni-Corradini *after* joining the Italian Futurists—which was not a practice common to Futurism. Perhaps it was an attempt to distance themselves from their family name and social position within the Italian aristocracy—their father, Count Tulio Ginanni Corradini, had been the mayor of Ravenna for years, and their privileged background may have been seen as supporting *passéist* ideals. Or it may have been a means to segment the brother's past work, completed under their given names, from their Futurist endeavours. Whatever the reasoning, the brothers' started officially operating under the names Ginna and Corra around 1914—names given to them by fellow Futurist Giacomo Balla.

[133] Corra, "Abstract Cinema—Chromatic Music," 66.

objects of our analysis, using concrete examples (paintings, writing, photographs) as creative guides. The objects, by necessity, are abstract forms that we can only understand by looking back, through this mediation of past and present. They are traces that must be filled in to be brought to life. The historical study of Italian Futurist movement, to a large extent, has been placed in a state of stasis in the English speaking world, without many new theories on the revolutionary nature of their art practice. Futurist cinema specifically has to date been largely understood in relation to narrative cinematic practices, so my argument about their earlier progressive and original contributions to transforming cinematic space through the *performativity* of the projector is new. While this chapter relies on the research of the prominent scholars on the Futurists, Giovanni Lista (who addresses the importance of performance and action in early Futurist cinema) and Günter Berghaus (who, along with performance, addresses how the ideas of abstraction and innovation in cinema were made possible by Ginna and Corra), I will expand on their work by looking specifically at the use of the projector's noise as instrumental for the creative production of abstract cinema, and, later in the chapter, the projector's noises as inspiration for the genesis of Russolo's the art of noises.

2.2 Noise, the Projector and the Birth of Abstract Film

Before looking at the first experiments with the projector-as-noise-instrument, this chapter must first establish the role of the projector as an instrument for active production of non-mimetic and/or abstract art. This is not to say that noise should necessarily be considered abstract sound, but, as discussed in the Introduction of this dissertation, there is a correlation between artistic interest in and development of abstract visual art and non-harmonic/atonal music. As previously mentioned, the first experiments with abstract cinema also focused on the liveness and *performativity* of cinema. Arnaldo Ginna and Bruno Corra, two brothers from Ravenna, Italy interested in the

113

development of abstract art, executed these experiments. [134] The brothers' interest in cinema developed out of their desire to formulate a new kind of art form—chromatic music—that would harmoniously combine formal aspects of music, painting and colour theory. By the time Corra penned and published his manifesto "Abstract Cinema—Chromatic Music" in 1912, Ginna and Corra had already written and published three major theoretical manifestos on what they called "the art of the future": *Metodo* (1910), *Vita Nova* (1910) and *Arte dell'avvenire* (1910) which was later reconceived and revised by Ginna as *Pittura dell'avvenire* (1917).

The aesthetic argument Corra makes in "Abstract Cinema—Chromatic Music" cannot be understood outside the context of these earlier works. In *Arte dell'avvenire*,[135] Ginna and Corra lay out the defining principles for their "art of the future," which are obtusely referred to in the opening paragraph of "Abstract Cinema—Chromatic Music." In that opening paragraph, Corra describes the genre of abstract cinema (which he first refers to as "chromatic harmony" and then later as a "motif of colours") that he and his brother had created as a "new art and more a rudimentary form of pictorial art."[136] As the brothers state in *Arte dell'avvenire*, the goal of their art of the future was, in essence, a based on a theory of pure and/or absolute art where the only difference between artistic disciplines and works of art was in the way they were *expressed*: (here, translated into French from the

---

[134] There is some discrepancy over the exact year Ginna and Corra began experimenting with abstract cinema, but it was likely around 1909/10. Ginna, at 19 or 20 years old, and Corra at 17 or 18, were both, by that point actively involved in the avant-garde art scene in Ravenna. After graduating from the Academy of Fine Arts, Ginna actively ought out recognition as a painter and theorist. Amazingly, Corra, by 17/18, was already a published author, whose ideas and short plays captured the attention of Marinetti. According to the research of Giovanni Lista, by 1909, Ginna and Corra had joined forces with fellow avant-garde artists in the Ravenna area (Irma Valeria, Mimi Gelmetti and Maria Crisi—who would later become Ginna's wife) who were also interested in pure and/or abstract art through the theories of spiritualism and cerebralism. This Ravenna-based group was in touch with another radical art group situated in Florence composed of Virginio Scattolini, Mario Carli, Remo Chiti and Emilio Settimelli. These two groups would later join Marinetti's Futurist movement, with Ginna, Corra, Settimelli and Chiti, along with Marinetti, forming the core of the cinema faction. See Lista "Futurisme indépendant" in *Le cinema futuriste* (Paris: Éditions Paris Experimental, 2008), 17.

[135] While no English translation of this text currently exists, I have pieced together some key points using a selection of the text translated into French by Lista.

[136] Corra, "Abstract Cinema—Chromatic Music," 66.

original Italian) "*l'essence des arts est une; mais varies sont ses moyens d'expression*"[137] or "the essence of art is singular; but the means of expression are varied." Not only did the brothers argue that there was a fundamental essence to art that could be *abstracted*; they also devised a structural hierarchy based on the modes of expression within which an artwork could operate. They called the first stage "Harmony," which they viewed as spatial, wherein complimentary but different colours, sounds or words were placed next to each other. They called the second stage "Motif" which expanded upon the first stage through the addition of temporality and movement. The third stage was termed "Image Harmony" which expanded further the previous stages with the addition of the expression of a complex idea (rather than a single point). And finally, they referred to a fourth stage they termed interchangeably as "Image Motif" and "Drama" which they defined as a dynamic and dialectical means of expression: "*le Drame est un ensemble de contrastes, un système de forces adverses où chacune maintient en équillibre une ou plusieurs autre forces*" or "the Drama is a set of contrasts, a system of opposing forces where each maintains in equilibrium one or more other forces."[138]

While the goal of any artist was to produce a work that fulfilled the requirements of this fourth stage in the brothers' hierarchy, as Corra explains in "Abstract Cinema—Chromatic Music," their experiments in abstract cinema never reach the level of Drama, operating instead in what they define as the first and second order of art: Harmony and Motif. But this, for the brothers, was the beginning of an exciting new art form based on their theory of absolute art. Ginna and Corra's primary objective for their chromatic music was to release what they termed "the art of colours" from the monopoly of painting. At first, following in the tradition of Louis Bertrand Castel, Frederic Kastner, Bainbridge Bishop, Alexander Wallace Rimington, Albert Michelson, *et al.*, the brothers

---

[137] Arnaldo Ginna and Bruno Corra, "Art de l'avenir" in *Le Cinéma Futuriste* (Paris: Éditions Paris Experimental, 2008), 92.

[138] Ginna and Corra, "Art de l'avenir" in *Le Cinéma Futuriste* (Paris: Éditions Paris Experimental, 2008), 92, translated by author. It is also noteworthy that the definition of the fourth stage of absolute art is invocative of flicker film, were the visual *noise* as the material product of these oppositional forces becomes the content of the work, which will be discussed in chapter 3.

began their experiments in colour music by constructing elaborate colour organs—pianos and/or organs that were modified to produce beams of coloured light rather than musical notes. Their methodology combined scientific research and personal expression. Separately, each brother researched physics, optics and art, coming together to present their findings and to decide how to proceed (i.e., determine which "notes" would be represented by which colours). Because the colour spectrum could only cover one octave, and they had at their disposal a twenty-eight keyed piano, they subdivided each of the seven "primary" colours into four equally distanced gradations. Twenty-eight electric light bulbs were coloured to correspond to each gradation, then fitted with oblong reflectors. The light bulbs were placed behind a sheet of ground glass to disguise their shape and diffuse the coloured light. When a single note was played, the one corresponding light bulb was be illuminated. For a chord, the two or three corresponding light bulbs lit up with the hopes of creating a layered visual harmony not unlike the "mingling" of the sounds of the distinct notes. However, in practice, the lights did not mingle. Instead they illuminated in their respective positions, perhaps meeting at their edges, but did not intertwine to create a similar harmonic effect as a chord. This, along with technical problems with their system (such as the relative short period of time each light bulb lasted and the relative limitation of possible colours), discouraged the brothers. As Corra later explained:

> We obtained the most graceful effects, it is true, but never to the extent that we felt fully gripped. We had at our disposal only twenty-eight tones, the fusion did not work well, the sources of light were not strong enough, if we used powerful light bulbs the excessive heat made them discolour in a few days, and we had to recolour them exactly, with considerable loss of time. We felt very clearly that, in order to obtain the large orchestral effect which alone can convince the masses, we needed to have a truly stupefying intensity of light at our disposal—only then could we emerge from the restricted field of scientific experiment to enter directly into its practice.[139]

---

[139] Corra, "Abstract Cinema—Chromatic Music," 67.

After exhausting the techniques of past colour music experiments, having decided that the colour organ/light bulb technology of the period was not capable of producing the sensational effects using this type of setup, the brothers sought out a new means of combining light and music.[140]

Ginna and Corra turned their attention to the film projector, seeing in it a technology that could offer them the powerful light source and dynamic movement they sought, and free them from the constraints of a set number of potential colours and colour combinations. By juxtaposing different colours in successive frames, the brother speculated that, when projected, blended, synthetic colours could be produced. As the brothers soon discovered, film allowed them to achieve a synthesis of colour, sound, form, and line they desired. Between 1910-1912,[141] they made no less than eleven films, all of which are unfortunately lost.[142] However, there are clues that can inform our ideas about these works. When reconstructing damaged or lost films, still documentation has been used when the motion picture is unavailable. Similarly, we can look to Ginna's painting as indications and preliminary sketches of the films. By painting directly onto the filmstrip, Ginna and Corra could produce a plethora of colours primarily because of the contrapuntal experience of colour produced through the movement of the projector. The brothers soon learned that, through the principle of afterimage which was considered to be part of the illusion of motion picture, they could create the dialectical effect of visual counterpoint: by juxtaposing two different colours in adjacent frames, the brothers were able to produce the illusion of a third synthetic colour, an effect described by Corra in the following way: "by exploiting the phenomenon of the persistence of an

---

[140] The success of Loïe Fuller's "light dances" (her experiments with coloured electric lights within dance performances, that preceded Corra and Ginna's experiments with chromatic music by nearly a decade) suggests that the merging of strong, luminescent coloured light was in fact possible, although theatre lights are much different from those available to the general population.

[141] This date range is according to the timeline offered by Corra in "Abstract Cinema—Chromatic Music," 66-70.

[142] As previously discussed, many of the early experiments with film by the European avant-garde have been lost or destroyed, which presents a number of problems for historical analysis.

image on the retina…to make many colours merge, in our eye, into a single hue."[143] The cinematic technique they were developing should be considered what I have termed *visual noise*, that is, as I argued in the introduction, a visual phenomenon without a desired and/or significant meaning, produced through the dialectical tension between what is present on the filmstrip and what is perceived by the audience through the act of projection. Of course, the brothers did *want* the extended visual image, the synthetic field produced by colision of the colours through the act of projection, just as Russolo, later, *wanted* the acoustic noisiness produced by his machines. A similar effect will be discussed in chapter 4 with regard to synthetic noise and the flicker film, with the projector as the instrument for visual noise. What differentiates Ginna and Corra's vision of abstract cinema from flicker, however, is the emphasis the brothers placed in the *harmonic merging* of colours, not necessarily the *noise* produced by the meeting of two contrasting frames.

Ginna and Corra's use of the projector as an instrument for productive, live and dynamic expression differentiated their cinematic practice from what we have come to accept as the cinematic experience, i.e. the representation of a photochemical, celluloid-based, mechanical reproduction (the representation of the filmstrip) in the negative space of a darkened theatre. This transition of the projector from a play-back machine to an instrument of productive creation was not seamless, although perhaps more natural in a period when the camera and projector were one-in-the-same machine, and, as suggested by many theorists including (and often referencing) Berghaus and Lista, within the context of Loïe Fuller's popular Serpentine Dance, a performance that incorporated cinematic elements through the use of projected coloured lights. Ginna and Corra's first experiments were unsuccessful in large part because they assumed that they needed to modify their projector. In order to achieve "a harmonious, gradual and uniform sequence of chromatic themes" the brothers "removed the rotating switch and had managed to get rid of the

---

[143] Corra, "Abstract Cinema—Chromatic Music," 67.

shutter action, too" of their Pathé projector.[144] Although his terminology is somewhat unclear, it is

most likely that Corra is referring to the Geneva Drive, a gear mechanism that controls the

intermittent motion of the filmstrip in the gate (i.e. what he calls the "rotating switch" or), and

external shutter mechanism which divides the projected light beam in order to produce the illusion

of continuous motion (i.e., what he calls the "shutter action"). By removing these parts, instead of

creating a continuous, harmonious, gradual, uniform, and steady image, the projector would produce

indiscernible, blurry bands of light. If projecting hand-coloured film, the projector would have

produced incoherent and indiscernible bands of vertical coloured lines, or, using Corra's own words,

"a cataclysm of incomprehensive colours."[145] The brothers replaced the projector's parts, and sought

a new method for producing their abstract, chromatic music.

Their next experiments proved more fruitful. In thinking of the filmstrip as a visual marker

of time, the brothers divided the filmstrip into musical bars, "each one as long as the space between

four perforations, which corresponds, at least in films of the Pathé gauge, to one complete rotation

of the switch."[146] By 1905, Pathé was producing 35mm film stock with four-perforations per frame

(they were, at this point, revolutionizing the film industry by insisting on different perforation shapes

---

[144] Corra, "Abstract Cinema—Chromatic Music," 68. Although there is no surviving documentation on the model of projector the brothers owned, it can be assumed that the brothers were experimenting with a Cinématographe built between 1905 and 1909. Pathé first produced Cinématographes in 1902, but the first significant changes to the projector came in 1905 with the introduction of the Pathé-Renforcé, the most popular of their models, which included the addition of the intermittent Maltese cross, a sprocket roller (replacing the vertical claw), an enhanced pressure plate at the gate, and a three-bladed shutter.

[145] Corra, "Abstract Cinema—Chromatic Music," 68. During my MFA at Bard College, Bob Bielecki modified a 16mm projector for me in a similar way—removing the shutter and mechanical claw. My interests, at the time, lay in the abstraction of representational imagery. I took 16mm educational films from the 1970s (recorded with a film camera, using very traditional and conservative shot compositions) and ran it through this modified projector. The resulting projection showed bands of vertical lines, containing the colours present on the filmstrip, with very little deviation in movement, rhythm or size. I found this visual effect was rather boring, this continuous stream of coloured lines, and my experiments with this apparatus soon ended.

[146] Corra, "Abstract Cinema—Chromatic Music," 68. Here, Corra clearly uses the term "switch" to describe the hand-crank mechanism of the projector.

119

for negative and positive film stocks, which is a differentiation still used today).[147] Therefore, the

visual translation of a musical score that Corra described would equate to one bar per frame.[148] Each

frame would then be subdivided to correspond with the musical time of the score, i.e., the frame

would be divided into four parts if the score was written in 4/4 time, into three parts if written in

3/4 time, into two parts if in 2/2 time, etc. Even with this seemingly logical system for translating

time, the projected film would not correspond to its musical counterpart insofar as the most

common projection speed of the period (16-18 frames per second) resulted in the duration of each

visual representation of an individual musical notation being far shorter than that *heard* if the same

score was played using traditional instrumentation and musical time. For instance, Ginna and Corra

based a film around Mendelssohn's *Spring Song*, which has a fairly fast beat (2/4 time in *Allegretto*

grazioso). Using Corra's described method, each "beat" or quarter note would represent half a frame

(the bar would be the full frame, therefore that frame would be divided in two)—i.e. 1/32 of a

second based on a 16 frame per second exhibition rate. In the musical expression of this score, each

beat would last much longer, at least half of a second or 8 frames. This discrepancy is one of the

indications that the brothers' actual knowledge of musical composition may have been minimal, and

could explain why, as I will soon address, Luigi Russolo was initially unimpressed by their

experiments and theories dealing with music.

However, after some experimentation, the brothers did modify their projector in ways to

accentuate and extend the performative function of film exhibition. The light source in the lantern

(an arc lamp) was replaced with one three-times more powerful—a terrifying adjustment in

retrospect, since the only stock available at the time was nitrate-based, and a stronger bulb could

---

[147] Harold Brown, *Physical Characteristics of Early Films as Aids to Identification* (Brussels, Belgium: FIAF, 1990), 6, 83.

[148] This, again, supports the idea that what Corra describes as a "rotation switch" is in fact an intermittent Maltese cross, which would complete a full rotation for the passing of a single frame.

ignite the highly flammable stock.[149] Speaking not only to the performative and theatrical leanings of

their cinematic practices, but also to these experiments as examples of early expanded cinema, the

brothers tested different screens including a "cubical cage of very fine gauze penetrable by the light

rays, which gave a fluctuating effect of clouds of white smoke," and in rehearsals they experimented

with interacting with the projected image by shrouding themselves in white drapes and engaging

with the projected painted colours[150]—reaching back to the avant-garde light/dance performances

of Loïe Fuller, and foreshadowing the use of the projected image in the avant-garde theatre of, for

instance, Robert Whitman and The Happenings of Carolee Schneemann in the 1960s. While

projectors and magic lanterns had been used in live theatre to generate ghostly apparitions (as

discussed in chapter 1), the films of Corra and Ginna were likely the first experiments with abstract

animation. The idea of the colour organ was a first step to an "art of the future" that they described

in *Arte dell'avvenire*—the projector, as they soon learned, allowed for an even more accurate

application of their ideas.[151] While it is widely believed that Ginna produced most of the films in

question, Corra's radical approach to theatre was likely a strong impetus in stressing the productive

and performative qualities of the act of projection.

---

[149] Let me address, briefly the mythology of nitrate film. While nitrate film stock is not necessarily more likely to ignite than other stocks, once on fire, nitrocellulose cannot be extinguished, as it produces its own oxygen, and can continue burning even when completely submerged in water. Nitrate stock, once ignited, also burns hot and fast. Many projectionists lost their lives in nitrate fires. Small gauge film stocks, which were designed for home and recreational uses, were made on safety stock—acetate-based celluloid stocks. This greatly reduced the fire hazard in film exhibition. All contemporary film stocks are created on polyester-based and/or acetate-based film stocks. In fact, there are a number of safety requirements needed for the projection of nitrate film; only 4-5 institutions in the United States, as of 2012, are equipped to project nitrate.

[150] Corra, 68.

[151] This is an excellent example of research-creation, where the art work, media technology and theory are mutually informed by each other.

2.2.1 Reconstruction

So far, I have explored the circumstance and theory around the birth of abstract cinema

without defining *what* the product actually resembled (i.e., what the films looked like) and/or a

material analysis of the cinematic experience. This absence can be explained, in part, because of the

lack of documentation regarding these films. However, by carefully studying the surviving

descriptions of the films, and comparing Corra's written accounts to the brothers' sketches,

paintings and sculptures, I have pieced together how a handful of these first abstract films may have

looked. This exercise of historical reconstruction serves to better explain their privileged role of the

projector in the production of and/or performative space of cinema, and to show how Corra and

Ginna's unusual use of cinematic technology on one hand created a visual "noise" through the

introduction of motion to abstract painting, and on the other, used the noise of the projector as the

soundtrack to these early performative film expressions.[152] In "Abstract Cinema—Chromatic

Music," Corra describes five finished films: *L'arcobaleno* (*The Rainbow*), *La danza* (*The Dance*), and three

of the envisioned "fifteen or so chromatic motifs, each about a minute long and each divided from

the next," that would "precede public performances, accompanied by suitable explanations" in order

to "communicate to the public the legitimacy of chromatic music, to help it grasp its mechanisms

and put it in the right frame of mind to enjoy the color symphony which will follow." [153] Although

---

[152] It surprises me that no one has yet pieced together documentation of how the films looked and what they were like. Corra's notes are fairly detailed, and Ginna's sketches and paintings relate directly to these descriptions. The only possible reason for this lack in historical research is that Corra and Ginna are themselves neglected figures in the history of Italian Futurism, these films were made before the brothers joined the movement, and, once the Futurists formally recognized cinema as an art form (with their 1916 manifesto "Futurist Cinema") their intention centered on the representational, photographic image. While the content of the Futurist message was controversial and revolutionary, their artistic choices could be considered very traditional. For instance, in the beginning, the movement focused on painting, sculpture, music, poetry and architecture – excluding new media. Like traditional cinema, Futurist cinema formally followed their idea of synthetic theatre. Or perhaps the reason for the omission is more sinister – the early abstract films could have been dismissed as "animation," infantilized in the same way, using the same logic, that made Huygens distance himself from the magic lantern.

[153] Corra, 69-70.

not mentioned in "Abstract Cinema—Chromatic Music," according to Lista, the brother completed four other films between June and October 1911: *Accordo di colore, Studio di effetti tra quattro colori, Canto di Primavera* (based on Mendelssohn's composition), and *Les Fleurs* (based on Mallarmé's poem).[154] All of the films explored the merger of colours and explored the concept of absolute art as a means of engendering synthesis between the fine arts and creating an art that would combine spatial (by which Ginna defined as exhibited in the realm of painting and colour) and temporal (by which he defined as musical) dynamics. Not only did the brothers perceive cinema and more specifically the projector as the instrument for bridging space and time, but they also understood that it was the performance of the projector that allowed for this expression of dialectical tension.

In order to have a better sense of what these films looked like, I researched Ginna and Corra's visual arts; very quickly, I was able to see patterns in the technical styles, content and colour choices of Ginna's paintings to Corra's descriptions of the films. Ginna frequently revisited several themes in his work, and developed these themes across different media. Some of Ginna's paintings and sketches even share the same names as the films.

The first resemblance I found was for the film *L'arcobaleno*, described by Corra in "Abstract Cinema—Chromatic Music." In 1911, Ginna completed a charcoal sketch titled *Poisia dalla terra al cielo* (see figure 2.1), which bears a striking resemblance to Corra's description. Not surprisingly, the dominant theme of *L'arcobaleno* was based on colour, but the films gained vigor through dialectics: the tension and harmony between movement and stasis, bright colour and muted greys, lines and circles, etc. In Corra's words,

---

[154] Lista, writing in French, lists the titles under French names (Accord de coleurs, Étude d'effets avec quatre couleurs, Chant de printemps and Les Fleurs). I have chosen to translate the titles into what I believe to be their original Italian. Although the French language was often used by some Futurists (particularly by Marinetti) Corra and Ginna it would seem (based on the few original texts available in Canadian libraries) worked almost entirely in Italian. Certain film titles, like *Studio di effetti tra quattro colori*, have a corresponding painting or drawing with an Italian title. In *International Futurism in the Arts and Literature*, Günter Berghaus uses the above listed Italian titles, with the exception of *Les Fleurs*, based on a French poem and thus, with a corresponding name. See Lista, 20-21, and Berghaus, 402.

The screen is initially grey, then in this grey background there gradually appears a very slight agitation of radiant tremors which seem to rise out of the grey depths, like bubbles in a spring, and when they reach the surface they explode and disappear. The entire symphony is based on this effect of contrast between the cloudy grey of the background and the rainbow, and the struggle between them. The struggle increases, the spectrum, suffocated beneath the ever blacker vortices which roll from background to foreground, manages to free itself, flashes, then disappears again to reappear more intensely close to the frame. Finally, in an unexpected dusty disintegration, the grey crumbles and the spectrum triumphs in a whirling of catherine-wheels which disappear in their turn, buried under an avalanche of colors.[155]

The drawing of the same name, while not following every detail of Corra's description, graphically and figuratively represents "radiant tremors" against the background of a "cloudy, grey" sky. The bubbling explosions, suffocating black vortices and Catherine-wheels are not clearly represented in Ginna's 1911 sketch of *Poisia dalla terra al cielo*, however, an indication of what they could have looked, what shape they may have taken, may be found in Ginna's dark sketch of a sunset over water in his 1910 drawing *Gioia intense* (figure 2.2). *Gioia intense* features a flurry of bubbles and the sun in the shape of half a catherine-wheel. The weight of the sun's reflection in the water could be interpreted as a dark vortex, but, given that Ginna was fairly literal in his representations, I suggest that a better indication of the vortices film may be found in a third sketch, *Studio per ceramiche* (1919) (figure 2.3), which depicts the spectral rainbow in the shape of a catherine-wheel distorted by a thin black line in the shape of a spiral vortex. Small details found in Ginna's 1911 sketch *Occhio sul mondo* (figure 2.4), like the eye which is made of a catherine-wheel for a pupil against a cloudy, light grey background of the eyeball, and the rainbow shapes pin-wheeled by dark absences (or vortices). These four sketches together paint a convincing picture of Ginna's visual style and provide us with a more comprehensive idea of the look of *L'arcobaleno* as it may have appeared in the dynamic form of a film.

---

[155] Corra, 69-70.

What is not clear from Corra's descriptions and the example of Ginna's still sketches is how these experimental animations would have appeared when projected. What we do know is that the brothers' definition of "abstract" does not correspond to the contemporary idea of abstraction. Ginna's paintings were particularly influenced by late impressionist paintings and his figures were fairly representational. Given the size of 35mm filmstrip and the dimensional restrictions necessary if they were, in fact, equating every frame to a bar of music (although there is no indication for this film that those were the parameters), if Ginna was replicating the image between every perforation, the projected image would include four stacked pictures within every frame. I can only imagine that the brothers would have noticed this problem and began animating frame by frame (contrary to Corra's description). Whatever changed in Ginna's drawing between each frame would appear to have moved. For instance, Ginna could have drawn the "radiant tremors" racing upwards, the catherine-wheel spinning, and/or changes in between the size of the objects. But these early direct animations would likely not have been perfectly aligned and so would have appeared to jerk around erratically. This jerkiness as well as the flicker produced by the Cinématographe in general would have produced a rather *noisy* image when projected. The image would have been unclear, undefined, difficult to identify and classify within the context of the known visual language structure.

While Corra's description of *La danza* was far less detailed, the information he provided was enough to find a plethora of visual aids in reconstructing an image of the film. Corra described the film based on its colour composition, "the predominant colors being carmine, violet and yellow, which are continually united, separated and hurled upwards in an agile pirouetting of spinning tops."[156] While Corra's description is minimal, other visual works made by the brothers can help us *imagine* the film. Ginna completed at least one sketch and one painting using the same colour schema described by Corra, both of which included "*danza*" (or dance) in their respective names: in 1912,

---

[156] Corra, 70.

the sketch *La musica della danza* (figure 2.5) and, in 1913, the painting *La musica della danza* (figure 2.6).

Not only does the painting and drawing share the colour and name of the purported film, but the

humanoid figures also share what could be described as a 'spinning" action. The film likely

contained the same long, thin, fiery brush strokes, and the swirling collision of colours reminiscent

of the patterns on spinning tops.

The visual noise produced on the filmstrip, given the kinetic and free flowing energy of

Ginna's sketch and painting, is perhaps easier to envision. The long brush strokes and vivid colour

combinations would have produced something similar to the style of someone like Stan Brakhage, if

you can imagine what a combination of the grass and long foliage in *Mothlight* (1963) with the colour

and force of Brakhage's hand-painted work, like *The Dante Quartet* (1987). Given the style of Ginna's

painting, I would hazard to guess that the shape and the form of the figures and the long wavy brush

strokes would have been the most intrinsic aspect to translate onto the filmstrip. As such, the timing

and framing may not have been such an issue. For when you make a cameraless 35mm film without

visible frame-lines, the film does not need to be properly framed within the projector, and, because

of this flexibility, each time that filmstrip is projected, if started on a different perforation, the

projected appearance of the film—its movement and content—would never be presented the exact

same way.

The three chromatic motifs described by Corra in "Abstract Cinema—Chromatic Music"

also have corresponding sketches and/or paintings. While the brothers intended on completing

fifteen of these short films, it is not clear if they actually finished more than the three described in

Corra's manifesto. Regarding the first chromatic motifs, Corra writes:

> The first is the simplest one could imagine. It has two colors only, complementaries,
> red and green. To begin with the whole screen is green, then in the center a small red
> six-pointed star appears. This rotates on itself, the points vibrating like tentacles and
> enlarges, enlarges until it fills the whole screen. The entire screen is red, and then

unexpectedly a nervous rash of green spots breaks out all over it. These grow until they absorb all the red and the entire canvas is green. This lasts a minute.[157]

The language is similar to that used to describe *L'arcobaleno*, with references to similar shapes, forms and movement. The imagery specifically recalls Ginna's sketch *Gioia intense* (figure 2.2). The notion of the rotating, vibrating tentacles conjures another of Ginna's later sketches, *Gioia Serena* (1940) (figure 2.7), insofar as in this sketch, Ginna not only repeats the same general themes and shapes, but also illustrates within each of the circular bubbles his technique for painting what could be interpreted as "a nervous rash" of dots and swirls. One of Ginna's early colour sketches may help to visualize the colour selection and the form of the progressive growth of the objects. In his 1909 sketch *Accordo cromatico* (figure 2.8), Ginna bases the synthesis within the image on two primary colours, in this case blue and red instead of the green and red used in the film. This sketch illustrates how Ginna moved between colours in order to generate a feeling of dynamic force, and also how, through a more abstract painting style, simple shapes like circles were transformed by his tentacle-like brush strokes. However, perhaps a more realistic vision of the movement created in this first chromatic motif is exemplified in Ginna's 1967 drawing of *Musica cromatica - Giove e Venere - Accordo cromatico* (figure 2.9), a much busier and noisier example of the infestation of shapes described by Corra, and the tension between dots and lines. Nowhere in Ginna's work could I find an example of a six-pointed star.

The second chromatic motif described by Corra in "Abstract Cinema—Chromatic Music" speaks to Ginna's influence from Italian Impressionism, which, combined with the Symbolist undertones of his theory, inspired pause in Marinetti and Boccioni. Nevertheless, the second chromatic motif, as described by Corra was based on the relationship between colours:

The second theme has three colors—pale blue, white and yellow. In a blue field two lines, one yellow, one white, move, bend together, detach themselves and curl up.

---

[157] Corra, 69.

> Then they undulate towards each other and intertwine. This is an example of a linear, as well as chromatic, theme.[158]

The linear theme Corra is referring to is simply the progressive narrative of the curling and intertwining movement. While there is not a clear example of this action in any one painting, the movements of lines swirling to become circles and then twisting together in a type of dance can be seen in many of the paintings and sketches previously described in this chapter, most notably *Musica cromatica - Giove e Venere - Accordo cromatico* (1967), and *La musica della danza* (1912, 1913). However, the colour palette of this chromatic motif closely resembles two of Ginna's early paintings: *Nevrastenia* (1908) and *Risveglio a finestra aperta* (1909) (figure 2.10 and 3.11 respectively). Ginna's paintings were inspired by the work of the Italian Symbolist painter Giovanni Segantini who used a similar colour palette. Ginna pushed Segantini's style into a more non-representational and/or absolute form, but one can see the influence of landscape painting in the younger Italian's work. This film is the only one painted using muted colours, which represents a striking difference from the brothers' other cinematic projects.

The final chromatic motif described in Corra's manifesto returns to the colour spectrum for its theme. As Corra explains:

> The third is composed of seven colors, the seven colors of the solar spectrum in the form of small cubes arranged initially on a horizontal line at the bottom of the screen against a black background. These move in small jerks, grouping together, crashing against each other, shattering and reforming, diminishing and enlarging, forming columns and lines, interpenetrating, deforming, etc.[159]

The repetitive theme of using the colours of the solar spectrum, or rainbows, speaks directly to the brothers' understanding of Nature in relation to formation of absolute art, as outlined in *Arte dell'avvenire*. Based on Corra's description, this particular motif was by far the most complex in the movement and interaction between the shapes. Despite Corra's description, Ginna rarely used what

---

[158] Corra, 69.
[159] Ibid.

we think of as perfectly square cube shapes. Instead he favored curved diamond shapes. However, one of Ginna's sketches from around the time of the film's construction, *Forme espressive di letizia e pessimismo* (1911) (figure 2.12), strongly resembles Corra's description. The sketch illustrates the coming together of diamond shapes in the form of a horizontal column, and the crossover space between the diamonds is demarcated by new patterns and (likely) colour fields. While there is no indication of whether Ginna had the animation skills to compose this level of intricacy on film, the sketch was likely his inspiration for the film.

While Corra describes only these five films in "Abstract Cinema—Chromatic Music," Lista suggests that the brothers had completed four other short abstract films: *Accordo di colore*, *Studio di effetti tra quattro colori, Canto di Primavera*, and *Les Fleurs*. Because of the generic name of the first film, *Accordo di colore*, and the lack of physical description, I cannot surmise what the piece may have looked like, nor speak to the use of noise in generating the "harmony of colours," but it may have been an early rendition of what Corra describes as the first chromatic motif. However, the second title is intriguing, for *Studio di effetti tra quattro colori* is also the title of a sketch made by Corra in 1907 (figure 2.13). The sketch illustrates not only what may have been the central theme of this film, but also the different voices projected by Ginna and Corra. The sketch *Studio di effetti tra quattro colori* (1907) shows four blurry circles of colour (green, red, blue and yellow, respectively) inside two thin rectangles (the interior one orange, the exterior yellow) on a yellow background. This sketch is particularly interesting because of the coloured space between the circles—the dialectical synthesis of colour light—and the spatial implications of the rectangles—which appear to give depth and a sense of staging to the image. The sketch most likely depicts the brothers' colour organ experiments which preceded their work with film, but nicely illustrates what contemporary flicker filmmaker Christian Lebrat refers to as "*des couleurs optiques*" (imagined colours that only exist in the act of projection, when material colours, separated by frames on the filmstrip, are weaved together (*tramer*)

129

on the screen, i.e. as colours present only in our eyes). I would like to imagine this cinematic experiment as the most formalist, under the care of Corra's voice, working with each colour in a separate frame to evoke *couleurs optiques* through the projection. In this sense, the film would not only privilege the movement in time, but also the act of projection as productive creative (i.e., making something new through the projector rather than reproducing what was already on the filmstrip).

The last two films described by Lista, *Canto di Primavera* and *Les Fleurs*, were likely early experiments conducted by the brothers and speak to their vision of an absolute art that was translatable throughout fine arts disciplines. *Canto di Primavera* is said to have been a direct colour translation of Mendelssohn's "Spring Song," Op. 62, No. 6, which likely was made using the inscription code described by Corra at the beginning of "Abstract Cinema—Chromatic Music" (i.e., translating the film frame into a musical bar, and colouring the filmstrip based on the musical score). While there are a number of possible historical methodologies for the translation between colour and sound,[160] there is no written documentation speaking to the system the brothers used. This method for creating chromatic music would have produced similar dialectical synthesis of colour to the above-mentioned *couleurs optiques* produced in *Studio di effetti tra quattro colori*. The last film speaks directly to the brothers' Symbolist influence. The brothers translated the content of Stéphane Mallarmé's poem *Les Fleurs* into a visual film. Like *Canto di Primavera*, no documentation remains on this experiment, however, given the colour palette described in the poem (gold, white, blue, violet, pink, and red), the thematic look may have been similar to paintings inspired by Segantini's Impressionist work. There is a striking similarity between the red splatter in Segantini, in *Nevrastenia* (figure 2.10) and what Mallarmé describes in his poem as "…la rose Cruelle, Hérodiade en fleur du jardin clair, Celle qu'un sang farouche et radieux arrose !"

---

[160] The history of colour music illustrates that, since the eighteenth century, Western theorists have been exploring the correlation between sound and colour, with varying results. For example, Issaac Newton equated the music note "C" with the color red; Louis Bertrand Castel translated "C" into indigo; and Herman von Helmholtz thought that yellow correlated with the note "C".

In these early cinematic experiments, the importance of noise as a material force that disrupts meaning, or, more simply, as nonrepresentational and/or abstract was not lost on Ginna and Corra. Yet the brothers did not wish to create something meaningless, or something that fell completely outside of language and representation. Rather, they wished to expand the parameters of the language system in order to include abstract space primarily by engaging in the performative aspects of visual space. While Ginna and Corra did purposely use their projector as an instrument, their focus was on the *visual noise* produced through the addition of movement to the static, plastic paintings on their filmstrip, and to the creation of a synthetic colour through the act of projection, not the *acoustic noise* of the machine itself. While the projector was part of the performance, its acoustic noise was not the primary focus. Rather, its noise was the unavoidable other. The images, although not abstract in the purest sense of the world (i.e., the painted images themselves were compositions based on personal impressions of the natural world, focusing on line, form, and movement rather than representational depictions of the natural world), but, like futurist painting (which Piet Mondrian criticized for being too representational, as I will discuss shortly) were a step removed from representation and narrative-based art. The brothers' choice to not *shoot* film and then transform the experience when projecting is interesting for it establishes that they were trying to evoke a very particular kind of abstract visualization. The choice to not paint over photographic imagery implies that they were not at all interested showing the world, or in creating "living pictures" in the traditional sense.[161] Ginna chose to paint "abstract" images as an extension of his painting practice rather than turning to film as a photographic art. The painted images where then further abstracted from their potential indexicality—they became *noisier*—when the filmstrip ran through the projector. Yet Ginna and Corra's decision to keep the shutter mechanism on the projector also

---

[161] It should be noted that the process of handpainting and/or tinting black and white film was a common practice, even in the commercial film industry, up until the 1920s, when color film technologies, like Technicolor, revolutionized the film industry.

suggests that the brothers *did* want the painted images to maintain some of their representational forms so as to be somewhat recognizable to the eye of the observer. These experiments surely were the first attempts to turn the projector into a noise instrument—in this case a *visual noise instrument*, i.e., an apparatus that, in the moment, transformed the materiality of the visual object on the filmstrip through the act of projection into something other. Yet the importance that they placed on the articulation of the tension between stasis and movement, between the Natural and the abstract, tied the brothers, ideologically, to the basic ideals of the Futurist movement.

While the concepts of *performativity* and *liveness* do not automatically or necessarily register in the analysis of noise, the role of the projector, including its noises, was highlighted in Ginna and Corra's early experiments and played a crucial part along with the audience in the production of cinematic space. In looking back, we can see how what I have defined as "noise" (i.e. the uncertain, murky, undefined space *between*, as a material trace of dialectical engagement) grounds Ginna and Corra's early experiments with cinema. Further, their use of the projector as a noise instrument should be considered as influencing Russolo's later theory of "The Art of Noises" and the design for his own *intonarumori* which have hitherto been considered an outgrowth of Marinetti's poetics rather than in relation to the projector, cinema and the mechanization of art practices. The mechanics of Luigi Russolo's *intonarumori*, in fact, resembled the design of early film projectors—a correlation never before explored—and demands a similar "new" negotiation of space, emphasized by the original and synthetic noises of the machine.

2.3 The Futurists and the Projector-as-noise-instrument

While all of these cinematic experiments were performed prior to joining Marinetti's Futurist movement, Ginna and Corra's innovative use of the projector was part of their public practice, and known to the futurists. Russolo, one of the executive group that met with Ginna and Corra in 1912

132

in order to determine whether or not the brothers should be invited into Marinetti's Futurist movement, not only had knowledge of these cinematic experiments, but doubted the viability of the brothers' artwork based on their lack of an understanding of music. Ginna and Corra's chromatic music, in Russolo's view, obscured the musical significance to such an extent that it could not be considered musical. Further, Ginna and Corra, admittedly, were not musicians or composers. They were not trained in music theory, as is apparent in their misunderstanding of the equivalence of musical time and film frame rates. Russolo immediately recognized the faults in the brothers' musical theory such as their lack of understanding of musical time, of harmony, of compositional structure, etc. because of his family's strong musical background and advanced knowledge of musical theory. While Russolo was troubled by the brothers' experiments, Ginna and Corra did introduce to Russolo the idea of using non-conventional instruments for the production of abstract and/or absolute artwork, which is central to his revolutionary invention of the *intonarumori* and his theory of noise as outlined in "The Art of Noises" first published in 1913, a year after meeting Ginna and Corra.

Although the story of the projector-as-noise-instrument began with Ginna and Corra *before* they became affiliated with Marinetti's Futurist movement, the Futurists and the young brothers shared many common goals. Primarily, both groups were interested in reinventing the definition of art, in removing themselves from the historical imprint of their predecessors, in engaging with the new experience of space produced through industrial modern society, and in creating art that was truly revolutionary and new. However, cinema and the use of cinematic technology proved to be one of their major ideological differences. The Futurists were somewhat divided about cinema and the photographic arts in general. Marinetti seemed somewhat indifferent to the medium. As present in his manifestoes, Boccioni, long believed to be the intellectual leader of the group, adamantly opposed the photographic arts, including cinema (which I will discuss further shortly).

Why did a movement that glorified technological and mechanical progress turn away from a dynamic new media? It seems almost counterintuitive that, although the Futurist movement was officially formed on February 20, 1909 with the publication of Marinetti's "The Foundation and Manifesto of Futurism" in the Parisian newspaper *Le Figaro*,[162] their first public acceptance of cinema did not materialize until seven and half years later, on November 15, 1916 with the publication of "The Futurist Cinema" penned by Marinetti, Corra, Ginna, Emilio Settimelli, Giacomo Balla and Remo Chiti (after Corra and Ginna joined the movement, and after Boccioni's unfortunate death). The manifesto followed the first legitimate piece of cinematic work produced by the group: the film *Vita Futurista*, directed and financed by Ginna, written and starring Marinetti, Settimelli, Corra, and Balla.[163] Although advertised in Italian newspapers from August 1916, the film itself was not publically screened until January 28, 1917 at the Teatro Niccolini in Florence.[164] Why did it take six or seven years for the Futurists to embrace an artistic discipline that, by all appearances, was inherently futuristic in that it was not bound to any of what they deemed to be "passéist" art practices, and was born of the mechanical technology of the industrial revolution?

There are discrepancies in the explanations for this lack of interest in cinema by the Italian Futurists, not only in the historical research, but also in the original Futurist manifestos. However, their reasoning for overlooking cinema must be addressed before we can explore the function of the projector as a noise instrument, or even simply as a noisy instrument, and the relationship between

---

[162] This manifesto was first published in French under the title *Manifesto du Futurisme,* and was later republished in Italian in various Italian newspapers. Within this manifesto, Marinettti laid the philosophical foundation for the movement, establishing Futurism as an artistic movement of the future based on the adaptation of speed and dynamism as a distinct shift in persepectivism brought forth around the turn of the century. Adversed to the techniques and tropes of Cartesian perspectavism and the established canon produced through the adherence to a formal art history, Marinetti called for art that embraced the economic and materialist attributes of late-industrial society, and that was based in the desire to revolt against the past towards the pursuits of new and revolutionary invention.

[163] While this film is now lost, Lista provides a very informative and detailed outline of the scenes and motifs of *Vita Futurista*, as well as documentation of the original script, in *Le Cinema Futuriste* (pages 27-35; 109-111).

[164] Lista, 27-29.

the projector and the *intonarumori*. Socioculturally speaking, Lista has offered the most likely

reasoning for the Futurists lack of initial interest in cinema: cinema was a commercially-based

medium of mass communication. There were notable artistic experiments with the cinematic

apparatus in the mid-to-late 1890s in France and Italy of which the Futurists were absolutely aware,

specifically the expanded cinema performances of Loïe Fuller and the animated wonders of George

Meliès in France, the (quite literally) "cinema of attractions" of Leopoldo Fregoli and Luca Comerio

in Italy, not to mention the experimental techniques and processes of the Lumière Brothers in

France and Edison's team of filmmakers in the United States. It was in this experimental spirit that

the brothers Ginna and Corra first came to cinema, a genealogy I will shortly explain. However, in

the late 1900s, and to the founding fathers of Futurism, the medium had already become a primarily

commercial enterprise. Popular cinema, although expressed in a new medium, did not explore

and/or probe the potential revolutionary effects of cinema, nor did it exploit the technological

aspects of film such as the characteristics of speed, mechanization, power and dynamism. Instead,

popular cinema aimed to please the masses, which, at the very heart, the Futurists strove against,

insisting instead that the masses needed to be jolted from their passéist slumber. Furthermore, as

cinema grew in the first decade of the twentieth century, the more experimental and/or artistic films

and the progressive use of the medium took a back seat to monetary considerations as the value of a

film was measured by and dictated by the development of commercial industry and financial success.

Many of the more avant-garde and/or experimental filmmakers[165] became disillusioned with cinema.

As suggested by Zielinski in his rehistorization of audiovision, this commercialization of

cinema which was marked by a burgeoning growth of narrative-based films was a deciding factor in

---

[165] Although the term had yet to be coined, those participating in the technological experimentation may have disagreed with such a categorization. Not only was there no "avant-garde film" in early cinema, but the leading artists of the time seemed to have little interest in incorporating film as technology into their practices. Avant-garde film, as a historical movement, did not gain its ground until the 1920s, when the Dadaists and Surrealists embraced the medium for their artistic pursuits.

the Lumière Brothers departure from film. In 1902, Louis Lumière insisted that the Cinématographe patents be sold, and Pathé was the recipient of the lucrative deal.[166] Louis Lumière specifically cited the prevalence of narrative cinema—film based on literature and plays—in his departure from cinematic experimentation. When discussing his participation in the Paris 1900 World's Fair (which offered what should be considered the first widescreen projection—projecting "living pictures" on an enormous screen measuring 16 by 21 meters, or approximately 52 ½ by 69 feet in the *Galerie des Machines*)[167]—Louis explained why he and his brother were withdrawing from the film business: "As its [film's] applications since the year 1900 had progressively developed in the direction of theatre and the main emphasis was now on staging, we saw ourselves compelled to close down these operations which we were not prepared for."[168] While this statement seems tepid, Zielinski implies that it was not an "unpreparedness" that dissuaded the Lumière Brothers from the cinema but a disinterest in the commercial productions sought after by the burgeoning distribution syndicates across Europe and North America. The medium was no longer being viewed as or pursued as a new and innovative art form and/or artistic technology.[169]

---

[166] Zielinski, *Audiovisions: Cinema and Television as Entr'actes in History* (Amsterdam: Amsterdam University Press, 1999), 27.

[167] For a full technical description of this project, please see: Louis Lumière, "The Lumière Cinematograph," *Journal of the Society of Motion Picture Engineers* 27 (Dec 1936): 640-647. In this article, Lumière describes the mechanical process for achieving widescreen motion picture, from adapting the projector and filmstrip to the preparation of the screen—a feat beyond any previous endeavour and/or expectation.

[168] Zielinski, *Audiovisions: Cinema and Television as Entr'actes in History*, 27-28.

[169] Film increasingly moved away from being considered a technology of *production* (of new spaces, new experiences, news sensations), and increasingly became a technology of *reproduction*. Hans Richter, writing some 50 years later on the idea of film as art, described the ensuing problem of narrative-based, commercial cinema: "The main esthetic problem in the movies, which were invented for *reproduction* (of movement) is, paradoxically, the overcoming of *reproduction*. In other words the question is: to what degree is the camera (film, color, sound, etc.) developed and used to *reproduce* (any object which appears before the lens) or to *produce* (sensations not possible in any other art medium)?" (in Hans Richter, "Film as Art" in *College Art Journal*, Vol. 10, No. 2 (Winter, 1951): 157). For Richter, the mantra for distinguishing "art film" found its heritage in the writings of Pudovkin: "What is a work of art before it comes in front of the camera, such as acting, staging or the novel is not a work of art on the screen"[169] (Richter: 157). Although their approaches were cameracentric, Richter and Pudovkin were both emphasizing the use of cinema as a means of *producing* a new conception of space (and, as such, new language, sensation and experience).

The Futurist cinema, in a sense, materialized because the commercial success of, on one hand, cinema, and on the other, Futurism itself. The political economy of cinema, on a more personal level also affected the Futurists' impression of the medium and inspired the necessity for a formal manifesto. In 1914, Marinetti was entangled in a brutal public battle with Aldo Molinari over the use of the moniker "Futurist" to describe the latter's film *Mondo Baldoria*, which premiered in Italy in February 1914. Molinari advertized *Mondo Baldoria*, a film loosely based on Aldo Palazzeschi's *Il controdolore: manifesto futurista* (1913), as the "first Futurist film." Marinetti, however, took issue with this claim coming from an individual with no formal association with *his* movement. Marinetti directly chastised Molinari in *Gli Sfruttatori del futurismo* (The Exploiters of Futurism)—originally a self-published leaflet that was later reproduced in *Lacerba* on April 1, 1914—for his unauthorized use of "Futurism," accusing Molinari of exploiting the term without any merit or right for personal financial gain. As Marinetti stated, speaking as the leader of the Futurists:

> We insist that we have in no way been involved in the invention, execution, and distribution of a film that is going around Italy, arousing people's curiosity by virtue of it ably wrought title *Mondo Baldoria* (Revealing World), "the first Futurist film." Some fragments of Pathé News, in which we figured, were incorporated in the film in such a way to make people think the film was ours. We scornfully reject any responsibility for all the shameful theatrical forgeries and foolishness, both written and painted, that many people, in bad faith and with the sole aim of financial gain, pass off as Futurist events.[170]

Humiliated and disgraced, Molinari was forced to remove his film from public distribution.[171] But the incident solidified the Futurists' belief that they needed to officially address the cinema. And necessity makes strange bedfellows; Marinetti, in 1914, then recognized his use for the cinematic experiments of Ginna and Corra who had endured a frosty reception from the Futurists upon their first introduction two years prior.

---

[170] Filippo Tommaso Marinetti, "The Exploiters of Futurism" in *Critical Writings*, ed. Günter Berghaus, trans. Doug Thompson (New York : Farrar, Straus, and Giroux, 2006), 178.
[171] Lista, 22-23.

While little information exists on this first meeting according to Lucia Collarile who is the historian charged with Ginna and Corra's estate and archive, Ginna and Corra were introduced to the Futurists through their mutual friend Francesco Balilla Pratella, after the group requested the brothers' company. Their first meeting took place in Milan, which was the Futurists' home base, around 1912. On the official website dedicated to the brothers, Collarile describes the meeting, quoting from Ginna's written documentation of the event:

> *Partiamo per Milano per incontro con Marinetti nella casa Rossa del Corso Venezia. Suoniamo alla porta, ci viene ad aprire Carlo Carrà, ci introduce nello studio salotto dove troviamo Marinetti, Boccioni, Russolo. Discussione lunga e accesa specialmente per ciò che riguarda la pittura. Mentre i futuristi si tenevano al concetto della dinamica noi eravamo convinti (attraverso le logiche espresse in Arte dell'Avvenire) che coi colori si potesse fare della musica in concordanza con la musica dei suoni…*

> We leave for Milan to meet with Marinetti in the house of the Red Corso, in Venezia. The doorbell rings, we are greeted by Carlo Carra, who leads us to the study lounge where we are introduced to Marinetti, Boccioni, Russolo. Long and bitter debate especially regarding painting. While the Futurists were held to the concept of dynamics, we were convinced (by the logic expressed in the art of the future) that with the colours we could create chromatic music in accordance with the sounds of music…[172]

The Futurists had been aware of the writings and artwork of the Ginna and Corra, specifically their theories of the "Art of The Future," as presented in the brothers' monograph, *Arte dell'avverire*. However, the Futurists took aim at Ginna's reverence towards spiritualist and cerebralist ideas, and were especially annoyed when Arnaldo participated in a group exhibition of the *Mostra Libera futurista* in 1914, which the Futurists had boycotted. Lista has suggested that Marinetti was more interested in Bruno's writing and theatrical work than in Arnaldo's painting and cinema. In a letter to Pratella, Marinetti wrote: "Young B. G. Corradini is undoubtedly a young man of great talent ... It's a clear symptom of a violent fever intellectual, the principle of a very marked originality... Write to him to

---

[172] Arnaldo Ginna quoted in Lucia Collarile, "Ginna futurista," Official Website of Arnaldo Ginna and Bruno Corra, http://www.ginnacorra.it/ginna/ginna_futurista.html (accessed October 9, 2012), translated by author.

visit me. I would be happy to know him personally."[173] And it was Corra who would be the first to be included in an official Futurist manifesto when, in 1914, he wrote *Weights, Measures and Prices of Artistic Genius* with Emilio Settimelli. From 1914 on, Corra helped to pen every early Futurist manifestoes about theatre and/or cinema. By all indications, despite the trepidations about Ginna, both brothers were officially christened into the movement around 1914, when Giacomo Balla gave them their futurist names: Bruno Ginanni Corradini became Bruno Corra (a play on the Italian word for "run") and Arnaldo Ginanni Corradini became Arnaldo Ginna (with reference to the Italian word for gymnastics).

While the Futurists may have been more impressed by Corra, Ginna was the brother more interested in cinema. Ginna continued exploring the practical application of the film medium as a technology, while Corra became more grounded in literary arts, and related to cinema primarily through the written word (as a screenwriter, and in writing *about* the medium). Both Ginna and Corra, however, were very involved in the first official offerings of a Futurist cinema (although concentrating on cinema as a photographic art, and moving away from their previous experiments with abstract cinema and/or chromatic music). The brothers were instrumental in the creation of the manifesto "The Futurist Cinema"(1916), as well as the first film endorsed by the Marinetti. The film, *Vita Futurista* (1916) began as a project conceived of, directed and financed by Ginna with the assistance of Corra and Emilio Settimelli. Marinetti caught wind of the enterprise and decided to make this project the first official piece of Futurist cinema, a decision brought to fruition by basically usurping the project from Ginna. Marinetti, along with Remo Chiti, Carlo Carrà, Nannetti Vénna, and Giacomo Balla, headed to Florence and all but took over the production. In some ways, this

---

[173] "Il giovane B. G. Corradini è indubbiamente un giovane di grande ingegno… E' il sintomo chiarissimo di una violenta febbre intellettuale, il principio di una originalità spiccatissima… Scrivigli di venirmi a trovare. Sarei veramente lieto di conoscerlo personalmente." Marinetti quoted in Arnaldo Ginna quoted in Lucia Collarile, "Ginna futurista," Official Website of Arnaldo Ginna and Bruno Corra, http://www.ginnacorra.it/corra/corra_futurista.html (accessed October 9, 2012), translated by author.

highjacking of the film proved fruitful, as Marinetti's strong vision of *performativity* and *liveness* helped guide the overall direction of the film, and Balla, an acclaimed designer, assumed the important role of set and costume design which helped give the film a progressive and unified "look." However, the interpersonal dynamics on set and after completion were less than amicable. Animosity between Ginna and the Futurists grew when the former, who endured a tremendous physical and economic burden from the production, was omitted from the first promotional material for the film.[174] Lista suggests that this omission was an intentional power play made by Settimelli against his adversary Ginna, and that there was a heated rivalry between them even though they had first embarked on this project together with Corra.[175] Whatever the intention, the action instigated another public feud. Ginna took to the newspapers, like Marinetti had done with Molinari, to reclaim his position as the director and creator of the film. Ginna organized another screening, in 1917, at which the film was critically panned by painter Cipriano Efisio Oppo. Dejected, Ginna never publically screened the film again, and, by the 1960s, the only three copies in existence were deemed either lost or destroyed.[176]

2.3.1 Futurism and the Photographic Arts

Before addressing Marinetti's theory of *performativity* and its relationship to noise, Boccioni's dislike for the photographic arts—the primary reason it took so long for the Futurists to become

---

[174] As described by Collarile, "Il film per Ginna fu un impegno notevole fisico ed economico, tutto sulle sue spalle, dato che i futuristi coinvolti nel progetto erano spesso indisciplinati, pigri, dormiglioni, insomma più impegnati in una impresa goliardica che in un'opera dagli esiti così importanti che diventerà la matrice di quasi tutto il successivo cinema europeo d'avanguardia,"; "The film was a major physical and economic commitment for Ginna, who bore the brunt of the responsibility, as the Futurists involved in the project were often unruly, lazy, sleepy-heads. In short, the Futurists were more engaged in an enterprise "goliardic" than in the necessary work to produce what could be the considered the first avant-garde European cinema" (Lucia Collarile, "Ginna futurista," Official Website of Arnaldo Ginna and Bruno Corra, http://www.ginnacorra.it/ginna/ginna_futurista.html (accessed October 9, 2012), translated by author.

[175] In his explanation, Lista suggests that Settimelli was extremely competitive with Ginna, but he does not elaborate on what started the contention. Settimelli was very close to Corra, so perhaps he viewed Ginna as a threat to this friendship. See Lista, 30.

[176] Lista, 30.

interested in cinema—should first be explained. For Boccioni, cinema was a reproductive

technology (i.e., without creative production and/or dynamic potential), which could not capture the

essence of the Futurist aesthetic. The founding principles of Futurism, which centered on the

concepts of speed and duration as well as the more controversial promotion of war, militarism, and

aggressive revolt, were outlined by Marinetti in his 1909 "The Foundation and Manifesto of

Futurism." In this manifesto, Marinetti married the concept of speed with modern mechanical

and/or electric technology. This is especially apparent in the 4th, 5th and 11th points of the manifesto:

4. We affirm that the world's magnificence has been enriched by a new beauty: the
    beauty of speed. A racing car whose hood is adorned with great pipes, like
    serpents of explosive breath—a roaring car that seems to ride on grapeshot is
    more beautiful than the *Victory of Samothrace.*
5. We want to hymn the man at the wheel, who hurls the lance of his spirit across
    the Earth, along the circle of its orbit.
11. We will sing of great crowds excited by work, by pleasure, and by riot; we will
    sing of the multicolored, polyphonic tides of revolution in the modern capitals;
    we will sing of the vibrant nightly fervor of arsenals and shipyards blazing with
    violent electric moons; greedy railway stations that devour smoke-plumed
    serpents; factories hung on clouds by the crooked lines of their smoke; bridges
    that stride the rivers like giant gymnasts, flashing in the sun with a glitter of
    knives; adventurous steamers that sniff the horizon; deep-chested locomotives
    whose wheels paw the tracks like the hooves of enormous steel horses bridled by
    tubing; and the sleek flight of planes whose propellers chatter in the wind like
    banners and seem to cheer like an enthusiastic crowd.[177]

The mythology of the birth of Futurism suggests that Marinetti wrote this manifesto shortly after

crashing his automobile and witnessed firsthand the sensational power and dynamic force of

mechanical technology. Marinetti wished for Futurism to revolutionize the definition of "art" in a

similar way that automobile, electricity, and new military technologies had revolutionized the

organization of social space. Speed, in this sense, was indivisible from the understanding of space.

Marinetti underlined that this new way of thinking about art was inherently linked to *speed* as a new

---

[177] Marinetti, "The Founding and Manifesto of Futurism," *Futurist Manifestos*, ed., Umbro Apollonio
(New York: Viking Press, 1970), 21.

mediator of time and space, as expressed in the eighth point of "The Founding and Manifesto of Futurism":

> 8. We stand on the last promontory of the centuries!… Why should we look back, when what we want is to break down the mysterious doors of the Impossible? Time and Space died yesterday. We already live in the absolute, because we have created eternal, omnipresent speed.[178]

This last sentence, referring to the absolute space and omnipresence of speed, hints at one of the major differences between Futurism and Cubism that is quite evident in their respective painting styles: while the Cubist embraced a multiple point-of-view perspectivalism (polyocular vision), the Futurists were interested in illustrating a single perspective travelling through space. This "omnipresent speed," this single perspective as experienced over time, was achieved through "plastic dynamism"—a fundamental concept, as I will now explain, in the theory and practice of Boccioni.

While Marinetti's writing is full of beauty and conviction, Boccioni, who joined Marinetti's movement along with his colleagues Russolo and Carrà in 1910, performed the intellectual heavy lifting for the Futurists. [179] For Boccioni, the concept of speed could only be understood in relation to the concept of dynamism, for an appreciation of speed and the sensation of speed was only obtainable through the experience and understanding of "the fourth dimension" (i.e., the temporal experience of three-dimensional space).[180] As the term "plastic" implies, when discussing dynamism

---

[178] Marinetti, The Founding and Manifesto of Futurism," *Futurist Manifestos*, ed., Umbro Apollonio (New York: Viking Press, 1970), 22.

[179] Boccioni, along with his friends Luigi Russolo and Carlo Carrà, joined the movement after meeting with Marinetti in late January or early February of 1910. Around the same time, Gino Severini, and Italian painter living in Paris, also joined the Italian Futurists. This would become the core membership of the first phase of Italian Futurism. Didier Ottinger, "Cubisme + futurisme = cubofutruisme" in *Le Futurisme à Paris* (Paris: Centre Pompidou, 2009), 22. Marinetti and Boccioni did not always see eye to eye on issues of philosophy and politics, nor on which of the independent artists working in Italy, inspired by Futurist thought, should be considered "futurists." For further reference, please see the compelling research of Lista and Marinetti's personal letters.

[180] When discussing the difference between a form and a line, Boccioni explains that "dynamic form is a species of the fourth dimension, both in painting and sculpture, which cannot exist perfectly without the complete concurrence of those three dimensions which determine volume: height, width, depth" (Umberto

and the fourth dimension, Boccioni was specifically referring to the plastic arts (painting, sculpture and architecture), and not to time-based arts (music, spoken poetry and/or film). Instead, he was stressing the importance of bringing this fourth dimension into two- and/or three-dimensional forms. Boccioni's definition of plastic dynamism also stressed the importance of gesture (the infinite succession of events) and simultaneity (the interpenetration of this succession as marked by experience of movement in time) in art. Yet dynamism moved beyond a simple perception of space; it necessitated an approach to perception that dialectically combined objective and subjective points of view. As he states in "The Plastic Foundations of Futurist Sculpture and Painting" (1913):

> …Atmosphere is like a material substance which exists between objects, distorting plastic values… Areas between on object and another are not merely empty spaces but continuing materials of different intensities, which we reveal with visible lines which do not correspond to any photographic truth. This is why our paintings do not have objects and empty spaces, but only greater or lesser intensity and solidity of space.[181]

Boccioni's vision was of a post-Euclidian conception of space in line with the transformation of the subject/object relationship caused by the sociocultural shift in public and private space, and by the polyeconomic transition into global industrial capitalism. Gesture, here, challenges the idea of articulation, suggesting instead that all marked points, and the spaces that separate them, are part of a continuous and unified movement.

For Boccioni, cinema and photography divided their subject from time and space by isolating and erasing the continuity of their dynamic gestures. Again, with regard to my thesis, which considers the projector as an active laborer in the production of cinematic space, Boccioni's approach is nurtured by a cameracentric view of cinema, but he is not alone in this emphasis. Instead of seeing the productive potential of the projector, for Boccioni, cinema was inherently

---

Boccioni, "Plastic Dynamism" in *Futurist Manifestos*, ed., Umbro Apollonio (New York: Viking Press, 1970), 93).

[181] Boccioni, "The Plastic Foundations of Futurist Sculpture and Painting," in *Futurist Manifestos*, ed., Umbro Apollonio (New York: Viking Press, 1970), 88-89.

divisive. And, therefore, Boccioni rejected cinema as anti-Futurist not only because the spirit and

mechanical reproduction inherent to the motion picture was in his view inherently imitative, but, as

he stressed repeatedly, because cinema itself was not *dynamic*. That said, Anton Bragaglia, an Italian

young photographer who fought vehemently to become an official member of the Futurists, but

who Boccioni refused to accept into the group, often appealed to Boccioni using a similar argument

that photography *could be* dynamic through experimental uses of the medium. In the 1911 manifesto

"Futurist Photodynamism,"[182] Bragaglia differentiated his own photographic experimentation which

he named Photodynamism from chronophotography and cinema, which, like Boccioni, he argued

broke down movement by reducing the gestural fluidity of the object's dynamic motion into a still

and static fragment. Bragaglia wrote:

> To begin with, Photodynamism cannot be interpreted as an innovation applicable to
> photography in the way that chronophotography was. Photodynamism is a creation
> that aims to achieve ideals that are quite contrary to the objectives of *all*
> representational means today… We are certainly not concerned with the aims and
> characteristics of cinematography and chronophotography. We are not interested in
> the precise reconstruction of movement, which has already been broken up and
> analysed, we are involved only in the area of movement which produces sensation,
> the memory of which still palpitates in our awareness.[183]

Within this statement, Bragaglia not only challenges the notion that the photographic arts

offer solely a reproduction, and/or a re-presentation of a captured moment, but extends the

definition of photography as having the potential to inspire an active, participatory, and dynamic

engagement with the observer, and showcase the gestural dynamism between the subject and the

object. Bragaglia attempted to activate the dynamic form of his subject in his photographs through

---

[182] At the time of its publication, Bragaglia's manifesto was not actually recognized by the Italian
Futurist movement, as Boccioni refused to accept photography as art up to his death and, as such, refused to
legitimize the work of Bragaglia as "Futurist" (Lista, 22). Bragaglia's manifesto was authenticated by Marinetti
years later, in his own "Manifesto of Futurist Photography (1930)" where the brothers Bragaglia were credited
with inventing photodynamism, and Marinetti advocated further research on "photographic science" in order
to develop absolute art and encouraged the development of absolute art in the fields of "physics, chemistry
and war " (Marinetti, "La Photographie Futuriste" in Lista, Le cinéma futuriste, 130).

[183] Anton Guilio Bragaglia, "Futurist Photidynamism (1913)," in *Futurist Manifestoes*, ed. Umbro
Apollonio ((New York: Viking Press, 1970), 38.

the use of open-shutter techniques (rather than time-lapse of Muybridge and/or Marey). By keeping

the shutter open and capturing the movement of his subject in front of the camera, Bragaglia

believed that his images illustrated this dynamic form by tracing their movement through space.

Boccioni, however, remained unimpressed with Bragaglia's experiments. For Boccioni, simply

demonstrating a trajectory of motion did not elicit the dialectical tension subjective and absolute

perception produced in plastic dynamism.

  According to Lista and supported by the Didier Ottinger, Boccioni had become more

rigid in his philosophy in 1911 after a trip to Paris where he observed the work of the Cubists and

began to isolate the central differences between the Cubist and the Futurist interpretation of space,

time and movement. As Ottinger suggests, both the Cubists and the Futurists had been influenced

by the writings of Henri Bergson on duration, and both groups sought to represent the new space of

the modern material condition. A previously discussed, Boccioni thought that the polyocular vision

of Cubist painting unnecessarily slaughtered any sense of subjectivity by obliterating the perspective

of the individual in favour of an impossible perspective of objectivity, whereas Boccioni was

interested in *representing* the dialectical tension between the subject and his/her atmosphere. Boccioni

had the same issue with photography, which he felt also alienated the object from his/her time and

space. While not directed overtly towards cinema, instead to Cubist painting, in "The Plastic

Foundations of Futurist Sculpture and Painting" Boccioni explains his stance against dividing up

gestural movement:

> Any dividing up of an objects motion is an arbitrary action, and equally arbitrary is
> the subdivision of matter. Henri Bergson said: "Any division of matter into
> autonomous bodies without absolutely defined contours is an artificial division," and
> elsewhere, "Any movement viewed as a transition from one state of rest to another,
> is absolutely indivisible."…Modern painting, however subjective, has hitherto always
> presented a spectacle of images which exist in front of our eyes. And though the
> Cubists showed objects in all their complexity—a painting being constructed

through a harmonious combination of one or more complexities within an environmental complexity – the spectacle itself did not change. [184]

This artificial division was also created when a camera, for either cinematic or photographic purposes, captured a moment. And his disdain for cinema is palpable within the same manifesto, when he directly addresses the disparity between Futurism and cinematic practices:

> Any accusation that we are merely being "cinematographic" makes us laugh—they are vulgar idiocies. We are not trying to split each individual image—we are looking for a symbol, or better, a single form, to replace these old concepts of division with new concepts of continuity. [185]

While Boccioni is correct in stating that the materiality of the filmstrip produces a compartmentalized image (or snapshot) of motion since the filmstrip comprises a multitude of still photographs placed in succession on a chain, he focuses only on the filmstrip itself and the image on the screen—a common misperception of cinema still practiced in much of contemporary film theory. Boccioni was looking at the stillness and at the objectness of film, and in doing so, missed the most basic functionality of the projector: its action and its potential for transforming two-dimensional space. If Boccioni had looked at the projector as a generative and/or productive apparatus capable of animating space and time and not only of amplifying an object, his outlook towards cinema likely would have changed dramatically. If Boccioni had *listened* to the projector, looked at the inflections within the light cone that carried the image, he might have seen the dynamic potential in cinema. Understanding the cinematic experience as beyond the frame could shift the fragmentation, linearity and continuity of cinema that Boccioni dismissed.

2.3.2 Performativity and Noise

As previously suggested, there is an important difference between Boccioni's conception of simultaneity and Marinetti's notion of *performativity*. For Boccioni, simultaneity was the product of

---

[184] Boccioni, "The Plastic Foundations of Futurist Sculpture and Painting," 90.
[185] Ibid., 89.

dynamism insofar as, for instance in painting, the expression of the subjective and objective states were to be *simultaneously* represented in the image, collapsing the moment in on itself.[186] In his own words:

> For us simultaneity is a lyrical exaltation, a plastic manifestation of a new absolute, speed; a new and marvelous spectacle, modern life; a new fever, scientific discovery.
>
> Simultaneity is a condition in which the various elements which constitute *dynamism* are present. It is therefore an effect of that great cause which is universal dynamism. It is the lyrical manifestation of modern ways of looking at life, based on speed and contemporaneity in knowledge and communication…[187]

For Marinetti, the concept of simultaneity and dynamic were less linked to our perception of space than to our experience of time. Marinetti's work and writing is much more focused on *performativity* and *liveness*. The difference between Marinetti and Boccioni's ideas are palpable when Boccioni's definition of simultaneity is juxtaposed with Marinetti's:

> Dynamic, simultaneous. That is, born of improvisation, lightning-like intuition, from suggestive and revealing actuality. We believe that a thing is valuable to the extent that it is improvised (hours, minutes, seconds), not prepared (months, years, centuries).
>
> We feel an unconquerable repugnance for desk work, *a priori*, that fails to respect the ambience of the theatre itself…WE ACHIEVE AN ABSOLUTE DYNAMISM THROUGH THE INTERPENETRATION OF DIFFERENT ATMOSHPHERES AND TIMES. E.g., whereas in a drama like *Più che L'amore* [D'Annunzio], the important events (for instance the murder of the gambling-house keeper) don't take place on the stage but are narrated with a complete lack of dynamism…in the Futurist synthesis, *Simultaneità*, there are two ambiences that interpenetrate and many different times at one.[188]

---

[186] According to Douglas Kahn, Boccioni's concept of simultaneity was extremely influential on the later works of sound poetry and most notably Bruitism, and specifically was important as a link between Richard Huelsenbeck poems and noise. Huelssenbeck's understanding of simultaneity—which reads to be more like Lefebvre's definition of rhythmanalysis, i.e. engaging with polyphonic and often incompatible *rhythms* (of objects, of social patterns, of noises) that would typically go unnoticed or ignored, and consciously watching/listening/feeling these rhythms come together and separate—does not have the same emphasis on identity and perspective as Boccioni's. See Douglas Kahn, *Noise, Water, Meat: A History of Sound in the Arts* (Cambridge, Massachusetts: Massachusetts Institute of Technology, 1999), 51-52.

[187] Boccioni, "Futurist Painting and Sculpture (extracts) (1914)": 178.

[188] Marinetti, "The Futurist Synthetic Theatre (1915)": 194-195.

Marinetti's understanding of simultaneity was more linear in his focus than Boccioni. As is apparent in his use of the term dynamism, Marinetti was concerned with the succession of energy and the collection of new methods of communication and expression, while Boccioni was concerned with relating a new means of sensory and spatiotemporal experience. These differences in the way they conceived of the moment (for Marinetti, as the quintessential denominator of liveness and as an articulation of progress, and for Boccioni, as an extension of human perception and the meeting place of often oppositional forces and intensities) were extended into their impression of cinema.

Marinetti's view of cinema was as an extension of his theatrical practice. Marinetti may have pioneered what would now be considered performance art. For Marinetti, performance was a way to marry the public dissemination of the Futurists' ideas and politics with the artwork the group produced, presented in what Berghaus describes as an early type of provocative multimedia performance, on a stage, in front of a live audience, which demanded active audience participation (typically acts of revolt *against* the performers). The staging of a Futurist cinema was set in relation to these events, which Marinetti named Futurist *serate*—a play on and against literary soirées—which were noisy, chaotic and often hostile happenings hosted in large auditoriums that could hold upwards of 5,000-7,000 people. As Berghaus has described:

> The *serate* were a weapon in the political and artistic fight for a total renewal of Italian public life. They were an all-round attack on the past and the social forces that sustained it. Not only did they serve to glorify war and revolution, they *were* an act of insurrection, "like the throwing of a well-primed hand-grenade over the heads of our contemporaries." But they also contained performances of an artistic nature, and it was in this combination of art and politics that the anarchist tradition of "generative violence" found its concrete application. … Marinetti's *arte-azione* (Art-in-Action) was an artistic-political battle directed *against* the audience he regarded as reactionary, passive, lazy, complacent, etc. In order to shake these spectators out of their stupor, the *serate* had to be provocative.[189]

The Futurist cinema, under Marinetti's direction, was meant to maintain this emphasis on liveness, improvisation, and desire to provoke an active response from the audience. At its core, from its

---

[189] Berghaus, *Avant-Garde Performance* (New York: Palgrave Macmillan, 2005), 33.

beginnings with Ginna and Corra, to its authentication by Marinetti in 1916, the Futurist cinema was always meant to be *performative.*

Boccioni, as previously discussed, dismissed cinema entirely. Marinetti, however, found it to be a useful means of promoting Futurism as an extension of Futurist theatre. Lista, who has completed the most comprehensive research on Futurist cinema available, has considered Marinetti's early relationship to cinema as being fairly ambivalent. According to Lista, Marinetti shared Boccioni's Bergsonian hesitation for the medium, "*autant dans le refus du cinéma comme simple reproduction mécanique et pseudo objective du movement, que dans la célébration de l'image cinématographique comme 'état d'âme,' c'est-à-dire comme possibilité de saisir la réalité en tant que durée, dimension de a conscience, pur devenir et development intéreur,*" or "as much in the dismissing of cinema as simply a technology of reproduction and a pseudo representation of time, as in the celebration of the cinematic image as 'state of mind,' that is to say as the ability to grasp reality as duration, as a dimension of consciousness, pure of spirit and internal development."[190] Lista's research on Futurist cinema, which most scholars have supported, has deemed Marinetti's involvement with the medium as an artform to begin with *Vita Futurista.* When Marinetti did become involved with cinema, he stressed the importance of the newness and liveness of the cinematic event as ways to combat the cinematic problem of mechanical reproduction. Marinetti tried to bring the dynamic energy of Futurist theatre to the realm of the motion picture.

In Marinetti's writing, however, there is some suggestion that he may have employed film in his theatrical performances as early as 1913, which Futurist historians do not mention or corroborate. In "The Variety Theatre" (Italian title "*Il Teatro di Varietà,*" Marinetti references making use of film to supplement his live performances. He states:

> The Variety Theatre is unique today in its use of the cinema, which enriches it with
> an incalculable number of visions and otherwise unrealizable spectacles (battles,

---

[190] Translated by author, Lista, 39.

149

riots, horse races, automobiles and aeroplane meets, trips, voyages, depths of the city, the countryside, oceans, skies).[191]

Here, Marinetti describes clearly not only that film was included in Futurist variety theatre, but also how it was incorporated and *what* was projected. While some of the material sounds to be general scenic and background ambiance, the inclusion of film is likely a nod to the historical magic lantern shows incorporated into variety shows and coffee house entertainment discussed in chapter 1. The inclusion of the motorized vehicles supports the mimesis of similarly noisy machine brought back to life by the projector's noises discussed in chapter 2. Both aspects suggest that Marinetti privileged the expressive qualities of cinema and the role of the projector.

In this same manifesto, Marinetti separates Futurist variety theatre from contemporary theatre, which he describes as following in the traditional paradigm of theatrical performance, by suggesting that non-Futurist theatre was actually a means of photographic reproduction:

> We are deeply disgusted with the contemporary theatre (verse, prose, and musical) because it vacillates stupidity between historical reconstruction (pastiche or plagiarism) and photographic reproduction of our daily life; a finicky, slow, analytic, and dilutes theatre worthy, all in all, of the age of the oil lamp.[192]

This passage suggests that it was not the photographic arts in general that Marinetti refuted, but how these new media had become imbedded in the old, passéist methods. However, the text does suggest that Marinetti viewed photographic reproduction, in general, as reductive. His use of the term does not refer to the technology itself, but rather to the quality of being mimetic, reductive and reproduced. With this distinction of terms, Marinetti opens the possibility for a Futurist cinema based on his ideas of *performativity* and dynamism.

Before signing "The Futurist Cinema" manifesto in 1916, there were other, less pragmatic, references to cinema in Marinetti's writing. Unlike Boccioni, Marinetti's references were not full of disdain or disapproval. He compared cinema to other mechanical technologies of communication

---

[191] Marinetti, "The Variety Theatre (1913)," 126.
[192] Ibid.

such as the automobile, the airplane, and the newspaper. In his influential manifesto on poetics

"Destruction of Syntax—Imagination without Strings—Words-in-Freedom (June 15, 1913),"

Marinetti notably refers to cinema along with other forms of mechanical communication,

transportation and information as a new technology capable of transgressing time and space, and of

influencing the ways in which we perceive the world. He states:

> Futurism is grounded in the complete renewal of human sensibility brought about by
> the great discoveries of science. Those people who today make use of the telegraph,
> the telephone, the phonograph, the train, the bicycle, the motorcycle, the
> automobile, the ocean liner, the dirigible, the aeroplane, the cinema, the great
> newspaper (synthesis of a day in the world's life) do not realize that these various
> means of communication, transportation and information have a decisive influence
> on their psyches.
>
> An ordinary man can in a day's time travel by train from a little dead town of empty
> squares, where the sun, the dust, and the wind amuse themselves in silence, to a great
> capital city bristling with lights, gestures, and street cries. By reading a newspaper the
> inhabitant of a mountain village can tremble each day with anxiety, following
> insurrection in China, the London and New York suffragettes, Doctor Carrel, and
> the heroic dog-sleds of the polar explorers. The timid, sedentary inhabitant of any
> provincial town can indulge in the intoxication of danger by going to the movies and
> watching a great hunt in the Congo. He can admire Japanese athletes, Negro boxers,
> tireless American eccentrics, the most elegant Parisian women, by paying a franc to
> go to the variety theater. Then, back in his bourgeois bed, he can enjoy the distant,
> expensive voice of a Caruso or a Burzio.[193]

This is not a repudiation, however neither is it a warm embrace. Instead Marinetti solidified the

position that cinema stood outside of the arts, but within a category of influence within the new

media and mechanical technologies that had first inspired his reverence of *speed*, as previously

discussed in this chapter.

Marinetti's discussion of cinema as a mechanical technology introduces to my argument the

use of *noise*. While he did not specifically broach the subject of the noisiness of the projector in his

"Technical Manifesto of Futurist Literature" dated May 11, 1912, Marinetti describes in great detail

how the noisiness of a mechanical apparatus (in this case a propeller) inspired his development of a

---

[193] Marinetti, "Destruction of Syntax—Imagination without strings—Words-in-Freedom (1913)" in
Futurist Manifestos, ed. Umbro Apollonio (New York: Viking Press, 1970), 96.

poetic syntax, one that privileges new images and analogies, limits subjective expression, and "destroy[s] syntax and scatter[s] one's nouns at random, just as they are born."[194] Take note of how, in the following passage, he describes the ways in which these new mechanical technologies of communication, transportation and information shift the perspective, the way we see, think and produce meaning, and to how it was the *sound* of the machine that provided this insight:

> Sitting on the gas tank of an airplane, my stomach warmed by the pilot's head, I sensed the ridiculous inanity of the old syntax inherited from Homer. A pressing need to liberate words, to drag them out of their prison in the Latin period! Like all imbeciles, this period naturally has a canny head, a stomach, two legs, and two fat feet, but it will never have two wings. Just enough to walk, to take a short run and then stop short, panting!

> This is what the whirling propeller told me, when I few two hundred meters above the mighty chimney pots of Milan.[195]

Here Marinetti demonstrates his own methodology of thinking through technology by pointing out the new rhythms and meanings produced by industrial mechanization. Marinetti employed the noises of these machines in his poetry and writing. Günter Berghaus has suggested that Marinetti used technology and the machine as his muse in order to contest the historical tradition of the concepts of female beauty and romantic love as the major motifs of poetic content.[196] While this reading of Marinetti's use of noise certainly fits into the Futurist's modernist agenda, I propose that the appropriation of noise was employed by Marinetti as a means of exploring the paradigm of space: on one hand, specifically incorporating the lived experience of the modern industrial world into art thereby representing our spatial landscape, and on the other, incorporating the aesthetics of abstraction/abstract art, and what McLuhan later described as acoustic space, into the poetic form.

Similarly, Marinetti encouraged the production of noise for and during the Futurist *serate*. As previously discussed, the Futurist *serate* were antagonistic events. Marinetti not only employed noise

---

[194] Marinetti, "Technical Manifesto of Futurist Literature," in *Modernism: An Anthology*, ed. Lawrence Rainey (Malden, Massachusetts: Blackwell Publishing, 2005), 16.

[195] Marinetti, "Technical Manifesto of Futurist Literature," 15.

[196] Berghaus, *Italian Futurist Theatre 1909-1944* (New York: Oxford University Press, 1998), 51.

(e.g., nonsensical words and phonetic extensions as well as verbal recreations of mechanical noises) in his manifestos, speeches and spoken poems presented at the *serate* but also encouraged the audience to be as *noisy* as possible. Marinetti specifically wanted a certain type of aggressive reaction of yelling, booing, threatening, throwing objects at the stage, and even rioting if possible. In short, Marinetti wanted the audience to be disruptive, to interfere with the intended program, to itself *be* a noise. If the audience was not responding accordingly, Marinetti and his Futurist brethren would hurl insults until the desired noise level was achieved.[197] Like the projector in Ginna and Corra's experiments, the audience's noises were *part of* the performance.

While one could argue that Marinetti incorporated noise into his writing as early as 1909 (with the emphasis on mechanical sounds and the noise of war found in "The Founding and Manifesto of Futurism"), his theory of noise-as-language and language as being spatial came to the forefront in 1913 with "Destruction of Syntax—Imagination without Strings—Words-in-Freedom," and with his visual poetry of the same era (1912-1914).[198] Through the development of Words-in-Freedom, Marinetti wanted to use words and letters as visual forms in order to provoke, as abstract painting had done, the representation of a material expression of a phenomenon in spacetime. It was important to Marinetti that words were not only "freed" from grammatical structure, but also from

---

[197] In *Italian Futurist Theatre 1909-1944*, Berghaus reconstructs accounts of these Futurist *serate*, and of the audience participation in Futurist synthetic theatre, wherein he describes the colourful insults the Futurist issued to agitate their audience. Some lively examples: 8 March 1910, at the Politeame Chiarella in Turin, Marinetti ends the *serata* with a heartfelt message to his audience: "And this is our second Futurist conclusion: The audience is often of enormous imbecility" (99); 21 February 1913, at the Teatro Costanzi in Rome, Marinetti, berates a group of aristocrats by calling them a "buffoon," "Jesuit disciple," "imbecile," "effeminate," "charlatan" and "parasite," Boccioni added to the heckling by shouting "We despise you like scabby dogs! You are the quintessence of human cowardice!" (117). On 12 December 1914, in Florence, during the *serata*, an audience member climbed on stage and offered Marinetti a gun, to commit suicide, to which Marinetti responded "If I deserve a bullet of lead, you deserve a bullet of shit" (125). Berghaus's chapters are filled with similar depictions, providing a vivid picture of the events, and a colourful (and entertaining) read. Berghaus, *Italian Futurist Theatre 1909-1944* (New York: Oxford University Press, 1998), 59-246.

[198] In 1914, Marinetti's influential *Zang Tumb Tuum* was published in French, by Poesia—the press which operated out of Marinetti's house. However, sections of the poem were previously published throughout 1913, in Italian, in *Lacerba*. Clara Elizabeth Orban, *The Culture of Fragments: Futurism and Surrealism* (Amsterdam: Editions Rodopi, 1997), 202.

representational meaning, which Berghaus later acknowledges in his *Futurism and the Technological Imagination* and runs parallel to the ideas on synthetic/animated sound that I will explore in the next chapter. As described by Berghaus, in *Zang Tumb Tuum* "we find the object quality of the text enhanced; words are not used for their semantic or referential function, but for their communicative and expressive possibilities in a visual key; the writing is no longer subordinate to the communicative and expressive functions of language, but tangentially autonomous of their denotational responsibility."[199] Marinetti's attack on the syntax and innovative use of words has been repeatedly linked to Russolo's development of "The Art of Noises"[200] likely because Russolo quote Marinetti's *Zang Tumb Tuum* within the first five pages of "The Art of Noises." But there are notable differences in Russolo's definition of noises and Marinetti's acoustic poetry.

Yes, Marinetti's poetry took on the noises of industrialization when he incorporated the noises of machines into his poems. This would cause a revolution in sound poetry that would *eventually* lead to the breakdown of meaning and syntax in the Bruitist poems of Richard Huelsenbeck, the Simultaneous poems of Tristan Tzara, and the Merz poems of Kurt Schwitters. But, in Marinetti's poems, the words still held their meaning as intact signs. The soundings, spelled out phonetically, were still very much representational and derived from our social space, from the experience of the lived world. In his manifesto, Russolo echoes Marinetti's call when he speaks of embracing "the newest noises of modern war" and the potential of noise and subdivides noise into six categories based on their expressive potential for what he terms "acoustic enjoyment."[201] But Russolo's noise instruments tell another story—one that might begin in the realm of representational sound but travels in search of pure noise that has been abstracted from its denotative function and naturalist landscape.

---

[199] Berghaus, *Futurism and the Technological Imagination* (Amsterdam: Editions Rodopi, 2009), 276.
[200] See Brown, Kahn, Berghaus, Venn, Manning, Chessa, Norgan, Bijsterveld.
[201] Russolo, *The Art of Noises*, trans. Barclay Brown (New York: Pendragon, 1986), 27-28.

2.4 Russolo, his Noise Instruments, and the Projector

When the Futurists finally came to the projector's noises, it was not through cinema, and it was not because of any kind of conscious awakening. Rather, the projector and the projector's noises, I will argue, served as a structural base from which Russolo's *intonarumori* emerged. When putting the technologies side by side, the physical similarities between the projector and the *intonarumori* are astonishing. Whether or not Russolo was consciously aware of the similarities is not the point of this exercise, and making such a historical claim would be like selling fool's gold.[202] Instead, in keeping with my methodology, the comparison between the projector and the *intonarumori* may only be possible from the historical position of looking back from a time when the materiality of the projector has become something to mourn. Russolo's use and theory of his noise instruments shared much in common with Ginna and Corra's use of the projector-as-instrument for the production of visual noise. For the purpose of this discussion, I will be comparing the *intonarumori*—Russolo's first musical inventions—to the projector. These machines were the prototypes for his theory of "The Art of Noises," but they were also, like the Cinématographe was to future of projectors and cameras, the designs from which the other instruments grew.

Although from a musical family (his father was an organist, his brothers composers and musicians, and there is evidence that he may have been an accomplished pianist in his own right),[203]

---

[202] In *Luigi Russolo, Futurist: Noise, Visual Arts and the Occult*, Luciano Chessa argues that Russolo consciously (and somewhat clandestinely) modeled his noise instruments (especially his later *rumorarmonio* or noise harmoniums) after sketches and schematics for musical instruments first designed by Leonardo da Vinci. Such an argument requires factual evidence Chessa never provided. Kahn suggests that the origin of Russolo's design came from "some very old instrumental technologies; the most modern element lurking within their design was the crank, which summoned up the rotary motion of Helmholtz's clinical sirens" (Kahn, *Noise Water Meat*, 129). Although I can delineate, with historical accuracy, a correlation between the use of a projector as an instrument, through the work of Ginna and Corra, Russolo and the design of some of his *intonarumori*, Russolo's being conscious of the similarities is irrelevant.

[203] While many authors (Brown, Kahn, etc.) have noted that Russolo was from a musical family, Berghaus is the only one to suggest he was an accomplished pianist. Berghaus sources a letter written by Marinetti to Pratella, dated January 20, 1913, where he refers to Russolo as "un formidable pianista" (Berghaus, *Italian Futurist Theatre 1909-1944* (New York: Oxford University Press, 1998), 118, fn152).

when Russolo joined the Futurists, he did so as a painter, not a musician. As for why he transitioned into music, no one seems sure of the reason. But, as a painter, Russolo was not receiving the same level of acclaim as his fellow Futurists, nor was the shy, soft-spoken man excelling at Marinetti's Futurist *serate*. Pratella, the individual previously charged as the voice of Futurist music, was a crowd favorite, according to Berghaus's reconstruction of the *serate*, but, as Kahn has emphasized, although embraced dissonance in his compositions, did not tread away from traditional compositional styles and/or the accepted (passéist) theory of music.[204] Marinetti financed Russolo's early work on noise instruments, up to, it would seem, the mid-to-late 1920s, when Russolo began focusing his attention on the commercial potential of his instruments in the silent film industry.[205] Unfortunately for Russolo, his desire to have his noise instruments become the major technology for providing sound for films was quashed by the advent of optical sound-on-film technology in the late 1920s.

Unlike Marinetti and Boccioni, Russolo had throughout his career an extensive history with cinema, and specifically avant-garde cinema. Russolo's idea of abstract noise music and the invention of new types of noise instruments to achieve these desired sounds revolutionized the definition of music (giving birth to "sound art") and had a direct and implicit relationship with the production of cinematic space insofar as the *intonarumori* and his later accompanied invention the *rumorarmonio* were often used to accompany silent films. As Kahn has noted, a *rumorarmonio* was installed at the famed Parisian movie theatre Studio 28—known as the theatre to host the premiere (and subsequent riot) of Dali and Buñuel's *L'age d'or*. Russolo nurtured the use of his noise instruments as film music, but, with the advent of sound-on-film technology, there was no longer a commercial market.[206] After the invention of sound-on-film technology, there was little use for live musical or sound accompaniment

However, Marinetti was known to embellish, so his word, without corroboration, may not be the best authority.

[204] See Berghaus, *Italian Futurist Theatre 1909-1944*, 100-122, and Kahn, *Noise Water Meat*, 56-58.

[205] Brown, 7-9.

[206] Kahn, *Noise Water Meat*, 130.

for motion pictures. With no funds to continue his noise research, in the 1930s Russolo turned his attention from the art of noise back to painting.

2.4.1 A Short History of the *Intonarumori* Performances

In "Polemics, Battles and the First Performances," Russolo describes the first public performance of his first fully constructed *intonarumori*, the *scoppiatore* (Burster). The exact dates get confused in the historical research, but according to Russolo "less than three months from the date of the manifesto ["The Art of Noises"] on the evening of June 2, 1913 before 2000 spectators at the Teatro Storchi in Modena, I explained and demonstrated the first noise instrument that I had invented and constructed with the help of Ugo Piatti."[207] The performance consisted of a more or less improvised playing of the *scoppiatore*, which produced a sound which Russolo described as "the noise of an automobile engine and could vary in pitch of the noise within the limits of two octaves."[208] This performance was met with mixed reviews, with a majority of the audience derisive, unaware of how to react to or comprehend the noises of *scoppiatore*. However, many were enthusiastic about the potential of this new machine capable of producing distinct timbre and changes of pitch using the noises of the modern world. Soon there after, Russolo completed three more *intonarumori*: a *crepitatore (crackler)*, a *ronzatore (buzzer)*[209] and a *stopicciatore* (rubber). On April 21,

---

[207] Russolo, 32. In the Introduction of *The Art of Noises*, while referring to the right instrument (the *scoppiatori)* in the right city (Modena) he states that the first performance was in April (Brown, Introduction" to *The Art of Noises*, 4). Without mentioning the instrument or place, Venn reaffirms Brown's timeline, stating that the first noise instrument was complete a month after the publication of the manifesto "The Art of Noises" (Venn, "Rethinking Russolo," Tempo 64 (251), 2010: 10), which, again according to Brown, was in March 1913 (Brown, "Introduction" to *The Art of Noises*, 1). It could be that private performances took place prior to the June concert to which Russolo himself refers.

[208] Russolo, 32.

[209] Brown translates *ronzatore* as hummers, but is more aptly translated to buzzer, which is the term used by Robert Filiou and Erik Levi. I have chosen to use the term buzzer.

1914, the first of a series of *intonarumori* concerts[210] was held at the Teatre del Verme in Milan,

featuring eighteen noise instruments and at least three original compositions by Russolo himself: *The*

Awakening of a City, Dinner on the Terrace of the Kursaal Diana, Meeting of Automobiles and Airplanes, and

Skirmish in an Oasis.[211] This concert was followed two days later with a performance at the Milan

Conservatory of music, one on May 20, 1914 in Geneva at the Politeama, and one on June 15, 1914

in London at the London Coliseum. The London concert reportedly attracted an audience of over

30,000 people and was declared "a 'triumph'" in the July 15 issue of *Lacerba*.[212]

Sometime shortly after this series of concerts, many of the Italian Futurists (including

Russolo, Marinetti and Boccioni) enlisted in the Italian military and were sent off to fight in World

War I where Boccioni was killed and Russolo was badly wounded. This hindered the progression of

Russolo's art of noises until June of 1921, when Russolo emerged in Paris to perform three concerts

at the Théatre des Champs Elysées. Although the first concert was marked by a loud protest by

Tristan Tzara and other Dadaists, which was quickly squashed by Marinetti, it was at these

---

[210] This series of concerts was preceded by a private performance in Marinetti's home for a selection of distinguished guests, including Marinetti, Pratella, Boccioni, Carrà, Cangiullo, Stravinsky, Diaghilev, Massine and an unnamed "Slav pianist." The event, and with explicit concentration on Stravinsky's reaction to the *intonarumori* was described in Cangiullo's autobiography. According to Cangiullo, "A Crackler crackled and sent up a thousand sparks like a gloomy torrent. Stravinsky leapt from the divan like an exploding bedspring, with a whistle of overjoyed excitement. At the same time a Rustler rustled like silk skirts, or like mew leaves in April. The frenetic composer hurled himself on the piano in an attempt to find that prodigious onomatopoetic sound, but in vain did his avid fingers explore all the semi-tones. Meanwhile, the male dancer [Massine] swung his professional legs, Diaghilev went Ah Ah like a startled quail, and that for him was the highest sign of approval. By moving his legs the dancer was trying to say that the strange symphony was danceable, while Marinetti, happier than ever, ordered tea, cakes and liqueurs. Boccioni whispered to Càrra that the guests were won over. The only person who remained unmoved was Russolo himself. He tweaked his goatee beard and said there was a lot to modify; he hated praise. As a polite murmur of disagreement started, Piatti declared that experiments would have to begin again from scratch. Stravinsky and the Slav pianist played a frenzied four-handed version of *The Firebird*, and Pratella slept soundly through it all," cited in Glenn Watkins *Soundings: Music in the Twentieth Century* (New York: Schirmer Books, 1988): 238.

[211] Levi suggests that Russolo composed and performed four compositions for these concerts: *The Awakening of a City, Dinner on the Terrace of the Kursaal Diana, Meeting of Automobiles and Airplanes*, and *Skirmish in an Oasis*. However, the posters for the Milan Teatro del Verme concert list only three compositions: *Risveglio di una città*, *Si pranza sulla terraza del Kursaal*, and *Convegno d'aeroplani e d'automobili*. Erik Levi, "Futurist Influences upon Early Twentieth-Century Music" in *International Futurism in the Arts and Literature*, ed. Günter Berghaus (Berlin: de Gruyter: 2000), 326.

[212] Levi, 325. All dates and performance venues from Berghaus, *Italian Futurist Theatre 1909-1944*, 325.

performances that Piet Mondrian and László Moholy-Nagy first experienced the *intonarumori*—

which, as I will discuss in chapter 3, introduced the direct use of the projector as a noise instrument

for the production of abstract sound. Russolo continued to develop noise instruments throughout

the 1920s, completing the *rumorarmonio* (noise harmonium) in 1924, which allowed for a multitude of

different noises to be generated from within a single machine, and an enharmonic bow, which

allowed for the production of new soundings of traditional string instruments.[213]

2.4.2 Reconstruction

Like the abstract cinema of Ginna and Corra, none of Russolo's original noise instruments

survived past World War II. However, unlike for Ginna and Corra's work, there is an abundance of

historical documentation on Russolo's noise instruments, including photographs, written

descriptions, patents, and sound recordings. While I have already professed my dissatisfaction with

the history of the Futurists available to English reading people, Russolo described his instruments in

such detail in his manifesto "The Art of Noises", his book of the same title is one of the Futurists'

most famous and readily translated texts. Through Russolo's descriptions and supplemented by the

historical research of Günter Berghaus, Barclay Brown and the reconstructive research-creation of

Stefania Serafin and Amalia de Götzen[214], we can conceive of a pretty clear picture of what the

intonuramori were like. Less information is available on the *rumorarmonio* and the enharmonic bow.

---

[213] Brown, 7.

[214] While the historical research of Serafin and Götzen presented in their paper "An Enactive
Approach to the Preservation of Musical Instruments: Reconstructing Russolo's Intonarumori," is very
informative, I take issue with their proposition that the digitization of the internal components of Russolo's
instruments will "illustrate and enhance their playability," because, by modifying the schematics of Russolo's
instruments, they were *changing* the original instruments. In archiving, this goes against the prime directive of
reconstructing or recreating a work of art: the point of the reconstruction is to re-present the material in as
close to the original form as possible. The considerable changes Serafin and Götzen made to the instruments
meant, if anything, that the pair was creating a new kind of instrument influenced by the *intonarumori*, but
these creations were not a reconstruction. See Serafin and Götzen, "An Enactive Approach to the
preservation of Musical Instruments: Reconstructing Russolo's *Intonarumori*," *Journal of New Music Research* Vol.
38, No. 3 (1999): 231-239.

However, as previously mentioned, the *intonarumori* bare the closest resemblance to the Cinématographe.

As previously mentioned, in 1913, Russolo had produced four different families of *intonarumori: the scoppiatori* (bursters), the *crepitatori* (cracklers), the *ronzatore* (buzzer) and the *stopicciatore* (rubber). Three years after the publication of "The Art of Noises" and after that first public presentation, in 1916, Russolo claimed to have made 22 different *intonarumori*, but really had 22 machines which produced varied pitches of 8 different noises: three *ululatori* (howlers); three *rombatori* (roarers); four *crepitatori* (cracklers); three *stropicciatori* (rubbers); four *scoppiatori* (bursters); two different categories of burster, the first two sounding, as previously stated, like automobile engines, and the second two (sounding like shattering dishes or pottery; two *gorgoliatori* (gurglers); one *ronzatore* (buzzer); and, finally, one *sibilatore* (whistler).[215] Brown adds that Russolo mentions the completion of two additional kinds of *intonarumori*—a hisser and a croaker, the former generating "a hissing or roaring noise like that produced by heavy rain" and the latter "a noise like the croaking of frogs"— in a letter to Pratella dated August 19, 1921, where he also claims to have combined the *ronzatore* and the *gorgoliatori*.[216]

For the comparison between the *intonarumori* and the Cinématographe, the categories of noise the instruments produced are not as important as their mechanical construction. From Russolo's own accounts and historical images of the *intonarumori*, we know the noise instruments were made to look practically identical, using the same basic model for their external construction: each was made of a wooden, rectangular box with a horn shaped amplification tube either in front or on top (see figure 2.14). The boxes varied in size, from 1½ to 4 feet long, tall and/or wide.

---

[215] The poster for the 1914 concert at the Teatro de Verme in Milan listed 18 *intonarumori*: three *rombatori*, one *gorgogilatore*, three *crepitatori*, three *ululatori*, two *scoppiatori*, one *scrosciatore*, three *stropicciatori, one sibilatore*, and one *ronzatore*. Levi, 326.

[216] Brown, 12-15. However, I think the instrument Brown refers to as "the hisser" is actually a variation of the *sibilatore* (whistler) or the *gorgoloatori* (gurgler) because of the descriptions Russolo provides in *The Art of Noises*.

Although not always visible in photographs, Stefania Serafin and Amalia de Götzen have observed that each instrument was also outfitted with a hand-crank (which operated as a motor and determined the speed of the internal mechanisms, like the Cinématographe) and at least one lever, sometimes two (that varied the tone produced by the instrument). As Russolo points out in chapter "The Noise Instruments" of his book *The Art of Noises*, some of the *intonarumori* were electric. The motion generated through the hand-crank on one these models was replaced with an on/off button that "produced [motion] electrically by means of a small current of 4-5 volts provided by a pile battery or storage battery."[217] The horn, or what Russolo called the "trumpet," was intended to help amplify and direct the noise like the horn of the phonograph and/or gramophone. But when looking at an *intonaumore*, the horn to me resembles the lens of the Cinématographe in the way horn is positioned to shoot (blow away) whatever is directly in front it, in its lack of ornamentation. Even the relation between the box and the horn are much more indicative of the Cinématographe *(*see figures 3.15 and 3.16) than a gramophone of the same time period (see figures 3.17 and 3.18).[218]

Russolo was more secretive about the inner operations of each instrument. As his arsenal of noise instruments grew, so did his concealment of his schematics. From the first hand account of an anonymous correspondent for the London *Pall Mall Gazette* who had been present at that first public performance where Russolo actually opened his machines for the audience to see, the inners of the *scoppiatore* consisted of "drum skins, wooden disks, brass plates or bagpipes, all set into motion by handspikes."[219] What the reporter describes corroborates and explicates photographic and written accounts provided in patents and in historical documentation. Russolo seems to have used similar internal mechanisms to create a number of *intonarumori*, including the *scoppiatori* (bursters), the

---

[217] Russolo, 76.

[218] Early models of the Berliner gramophone (figure 2.19) are the closest to matching the *intonarumori*, and the resemblance is nowhere near that of the Cinématographe.

[219] Brown, 5. Brown's research has been criticized by John C.J. Waterhouse for the lack of hard scholarly resources. For my postgraduate work, I would like to perform a more thorough investigation of the remaining archival information on the *intonarumori*, with funding, and after learning Italian.

ululatori (howlers) and the *gracidatori* (croakers). Each of these designs contained a diaphragm between the connection of the horn and the box, which acted like a diaphragm on a speaker. A metal string was attached to the center of this diaphragm and to a lever on the outside of the box, which was used by the musician to direct the pitch of generated noise. The hand-crank controlled a long spindle, which had a wooden or metal disk attached to it. This disk had teeth or indentations (like the blades of a circular saw), which, when rotated, plucked the string and activated the diaphragm. It could be that some of these "disks" were made of pipes welded together in the shape of a catherine's wheel—this might be what the reporter meant by bagpipes. Changing the details of these basic components allowed Russolo to produce a variety of different noises, as for instance the noise of a wooden disk versus a metal disk against the string. The size of the indentations on the disk would likewise change the rhythm with which they hit the string, as well as the timbre, and create also different noises. The use of a metal string versus a cloth string would produce different noises as well.

Unlike the Cinématographe, for which the handcrank changed position from behind the machine to the side to allow for the projectionist to turn the crank less awkwardly while avoiding the interruption of the light beam from the magic lantern by the hand of the projectionist, the position of the handcrank on the *intonarumori* affected the production of sound. Where the handcrank was positioned on the box dictated the position of the disk in the guts of the machine. Take, for instance, the *crepitatori* (cracklers): the handcrank for this *intonarumori* was positioned at the side. When turned, the connected wooden or metal disk would hit a string that ran parallel to the diaphragm. This string would vibrate against a second string, attached to the diaphragm and connected to a tension lever.[220] The noises produced by the *crepitatori* were generated by the two

---

[220] While, through their own reconstructions of the machines, Serafin and de Götzen stipulate that the crackler was made using this double string configuration, Brown thinks that its guts consisted of the

strings hitting each other. The *crepitatori* also possessed a lever which controlled the tension of the diaphragm, and thus changed the pitch of noise emitted by the instrument. According to Serafin and de Götzen, the *stroppicciatori* (scraper) adopted the same internal mechanisms (with, one must assume, some kind of differentiation in the width of the strings and/or the indentations of the disk). Brown's research has suggested that the variations on the disks used could manipulate the produced noises. As Brown describes:

> Experiments in reconstructing the instruments show that a wooden disk with an even but roughened rim, turning against the wire that connects with the drumskin, produces a sound much like that which Russolo describes for the howler. A wooden disk with indentations produces a noise similarly matched to the description of the roarer. A metal disk with teeth like those of a ratchet makes a noise like that of the crackler. A metal disk with shallow indentations produces a sound like the rubber.[221]

It is likely that Russolo used these slight variations of this diaphragm/string/lever and handcrank/disk system for most of his early *intonarumori*.[222]

While there was no string or diaphragm on the Cinématographe, the internal mechanisms were similar in principle. The diaphragm, the platform from which the sound was amplified, in optical terms, is analogous to the condenser lens on the projector. The disk, turned by the handcrank, was similar in size and function to the shutter of the projector. The Cinématographe through the 1920s had an external shutter (see figure 2.20 in which the shutter is the circular apparatus attached in front of the lens, which was used to divide the projected frame as to give the illusion of perpetual movement with less flicker). Like the disk described in Russolo's *scoppiatori*, the

---

single string model using a metal disk with small, ratchet-like teeth (Brown, "The Noise Instruments of Luigi Russolo," 45).

[221] Barclay Brown, Introduction in *The Art of Noises*, trans. Barclay Brown (New York: Pendragon Press, 1986), 13.

[222] Serafin and de Götzen stipulate that the *scoppiatori* (bursters), the *sibilatori* (whistlers) and the *gorgogliatori* (gurglers) also used this diaphragm/string/lever and handcrank/disk model. Serafin and de Götzen, 231-232.

shutter was necessary for the production of the amplified image.[223] However, the Cinématographe was a much more sophisticated machine than the *intonarumori:* the handcrank controlled much more than just the shutter because it was the generative power for the Geneva Drive that produced the intermittent motion of the projector (by powering the claw, the driving sprocket, and the pressure plate of the projector's gate). That said, the act of hand-cranking the *intonarumori* positioned it closer to the Cinématographe than the gramophone or phonograph in two important ways: first, the gramophone and phonograph were both spring-loaded by this point and as such the physical engagement of the musician (and the audience through observing the musician) was more in line with the projectionist and the Cinématographe than the automatic sound production of the gramophone and phonograph, and second, the *action of cranking* was directly tied to the *production of the noises.* The Cinématographe, like the *intonarumori* was an instrument for the productive creation of new, synthetic phenomena.

Much like the reconstruction of Corra and Ginna's first abstract films did not match my preconceived idea of what they would look like, Russolo's descriptions of the noises produced by the *intonarumori* do not match my experience when listening to the archival recordings. This may be a question of material history, for my experience of the world is much different than his would have been, for as Zielinski, among others, has suggested, it is impossible to go back in time and experience the way something sounds in that socio-historic space. There are recordings that have survived of Russolo *gorgogliatore* (gurglers), *ronzatore* (buzzers), *ululatori* (hooters), and *crepitatori* (cracklers), yet my experience of the instruments differs dramatically from how Russolo described them in *The Art of Noises.* For example, Russolo described the *gorgogliatore* (gurglers) as:

---

[223] Because the Cinematographe model was one of the, if not the, most popular in camera/projector in France and Italy in the first decade of the nineteenth century, and because the mechanics of the machine were so obvious to whomever was using or observing the apparatus, I believe that Russolo would have knowledge of this mechanical construction. I think that it was the projector's shutter that inspired the idea of accelerating disc in the *intonarumori.*

…produc[ing] a complex timbre, like water running through a rain gutter, with its metallic and curious rhythm. By means of a stop, it can make as hissing noise of rain. Although it has an apparently weak timbre, it is one of the instruments most easily distinguished in loud passages. It may even be heard better at a distance than nearby – and least of all by the performer who stands behind the trumpet. This last effect, common to all the noise instruments, is the most pronounced in the gurglers. The gurglers have a group of harmonics that correspond in a certain way to the minor tonality. The interesting contrast that is heard between this minor tonality and the curious rhythm makes up a complexity of its noise.[224]

However, to me, with my contemporary ears, the *gorgogliatore* (gurglers) has a sound more like a thumb piano, than running water or the "noise of rain." Similarly, Russolo described the *ronzatore* (buzzer) as having

…a sweetly harmonious noise-sound, full of fascination and recalling the humming of dynamos and electric motors, whose curious sound fills the great electrical centers and is always associated in our minds with the vision of great, gleaming, very modern and marvelous factories. The timber of the hummer [buzzer] includes some very charming harmonics, the fifth above, the octave, and its third, over the fundamental.[225]

To me, the recordings of the *ronzatore* (buzzer) sounds like a 16mm film projector, and while the passage is quite poetic, the recording does not exhibit the harmonics Russolo outlined. My experience of the *ululatori* (howler) also does not match Russolo's account:

The HOWLERS (*Ululatori*) are the most musical of the noise instruments. The howling that they produce is almost human; and while they recall the siren to some extent, they are also a little like the sounds of the string bass, the cello, and the violin. In a certain sense, they could be substituted for each other, the low howler for the string bass, the medium for the cello and the high for the violin.

In addition, they have an advantage over their brother instruments in the traditional orchestra, being able to hold a note as long as desired without a change of bow, which produces not only a suspension (or better, modification) or timbre but also a rhythmic renewal in the held note.

The howler is a mysterious, suggestive instrument that takes on an intense expressiveness in various enharmonic passages and offers many resources, being capable of the most perfect intonation.[226]

---

[224] Russolo, 78-80.
[225] Russolo, 79.
[226] Russolo, 78.

Unfortunately, my ears do not perceive the same range of noise as described by Russolo. I hear a blender or distant lawnmower, but nothing reminiscent of the human voice, and only a siren insofar as the pitch of the noise gradually elevates. The final surviving recording is of the *crepitotore* (crackler), which, Russolo offers,

> …produce a metallic crackling for which it is difficult to find an analogy. They have a great intensity, easy and perfect intonation, and a timbre rich in harmonic sounds, offering very great resources, especially in the variations of intensity in the high cracklers, which can produce a high-pitched grunting like a pig being skinned, or just as well, a very sweet and controlled tinkling, staccato and silvery.
>
> The high crackler lends itself magnificently to the very effective solo passages. It is perhaps the instrument on which the greatest virtuosity is possible.
>
> The low ones, however, produce an effect like the clashing of metal shaken with confusion and speed, or a clarity and dryness that is truly crackling.[227]

To me, the *crepitotore*, sounded like a loose muffler scraping the pavement—that is to say quite beautiful and spirited, but nothing like the "grunting like a pig being skinned" (which is a sound, as an urbanite of the twenty-first century, that I am happy to say I have never heard). Suffice to say, the *intonarumori* produced sounds like no other historical musical instruments or sound inventions of Russolo's period.

2.4.3 Nitty Gritty

Ginna and Corra used the Cinématographe to produce abstract visual noises (although in that production, the Cinématographe-as-instrument also produced mechanical noises that the brothers neither concealed nor embraced). Russolo similarly wanted to produce abstract acoustic noises. That Russolo's instruments engendered indexical experiences to the noises of known objects suggests one of the more problematic concerns in his art of noise: the issue of abstraction and representation. Mondrian in his critique of Futurist music notes that while Russolo and his noise

---

[227] Russolo, 78.

instruments took the first step towards a noise-music, they did not operate within the realm of pure abstract expressionism. Mondrian, however, felt similarly that all Futurist artistic endeavors were the first step, but did not go far enough, and that they did not achieve the goals his "new plasticism" (which bore a similar definition to Boccioni's view of plasticism, but emphasized the "pure expression of the equilibrium" between the individual and the universe by *abstracting what most is outwardly and by determining (or crystallizing) what is most inward*."[228] Mondrian's theory of Neo-Plasticism demanded a more conceptual, less representation-based expression than the more perceptually driven expression (visualizing one's experience over time) put forward by Boccioni. Most of Russolo historians have not addressed the impact of Boccioni on the *intonarumori*, but, as Kahn has discussed, Russolo's definition of noise was based on the idea of *continuity*, as the acoustic signifier of Boccioni's reading of duration. The noise generated by the *intonarumori* was continuous; there were no breaks in the articulation or measured notes in time. Instead, as apparent in Russolo's notation system, the progression of sound was built on shifts of timbre (see figure 2.21).

Russolo wanted to bring in the noises of everyday life, of the modern urban experience, while at the same time avoiding imitation of worldly sounds. He attempted to achieve this by producing (not reproducing) a sound that was indexical, but not exact, to recognizable sound, but then to shift this indexicality through manipulating time, pitch and timbre. The *intonarumori*, in this sense, manipulated the experience of the aural object by deregulating its representation in time, i.e., by taking the sound away from its natural sign and natural significance. This experience of noise through the *intonarumori*, then, produces an indexical space much like that Mary Ann Doane ascribes to cinema. Doane has suggested that "the indexicality of the cinematic sign appears as the guarantee of its status of a record of temporality outside itself—a pure time or duration which would not be

---

[228] Piet Mondrian, "The Manifestation of Neo-Plasticism in Music and the Italian Futurists' *Bruiteurs* (1921)" in *The New Art—The New Life: the Collectives Writings of Piet Mondrian*, ed. Harry Holtzman and Martin S. James (Boston: G.K. Hall, 1986), 150.

that of its own functioning."[229] The noises of the *intonarumori* operate in the same way by *producing*

the acoustic sign outside of its natural time and place. What Doane misses in her otherwise

impressive analysis of cinematic time is the *performativity* and *liveness* of the experience of cinema

which differs from the tension of presence and instantaneity (which are focuses in the screen space

and *narrative* time of the representation). For Russolo, like Ginna and Corra, the *liveness* of the

production of noise was paramount to the experience.

Russolo *could have* employed recording and manipulated their content if he had wanted. The

technology was available in the form of phonographs, gramophones and even music boxes and

player pianos. Any of these devices could have been modified to manipulate the recorded sound, in

the vein what is now known as DJ culture. But for Russolo, the *liveness* of the *production* of noise was

just as important as the noise itself. It is not only *continuity* that was emphasized in Russolo's

intonarumori—it was also the *performativity* of the event itself. Russolo's *intonarumori* produced live,

original noises, much like the innovative use of the projector did for Ginna and Corra. In both cases,

the artwork was not a mechanical reproduction of a recorded thing but existed only in the *performance*

of the mechanical instrument. By focusing on the noises of the material body of their instruments,

Ginna and Corra and Russolo were transforming the experience of the machines from one that

generated and was generated from an indexical relationship to time and the (acoustic or visual)

object to one that was produced from the live experience within the performative space of the

instrument. This shift in perspective is a major deviation from the standardized experience of

cinema (and/or a technology of reproduction in general) as derivative from the screen space, which

isolates and amplifies the inscribed content of the camera representing another place and time.

Instead, by using their instruments as generative tools as means of creation not representation,

---

[229] Mary Ann Doane, *The Emergence of Cinematic Time* (Cambridge, Massachusetts: Harvard University Press, 2002), 23.

Ginna and Corra and Russolo were engaging in a production of space based on the new ideas of *duration* and *abstraction* that emerged at the turn of the century.

2.5 Conclusion

This chapter has discussed the innovative use of the projector's noises by the Italian Futurists in order to explain how the noisiness of the projector's body was employed to focus the production of cinematic space on the *liveness* and *performativity* of the mechanical instrument. The Cinématographe for Ginna and Corra was not a machine for reproduction or representation; it was an instrument for the production of new sensations and visual possibilities. The *intonarumori*, similar in design to the Cinématographe, was for Russolo also not a machine for reproduction or representation; it was an instrument for the production of pure noise. The noise of these two instruments similarly spatialized the audience's body within the liveness of the experience, creating an alternative to the experience of traditional cinema that negated the lived body for an *image-inary* experience represented on the screen, and championed the value of noise as an aesthetic form. From this position highlighting *liveness* and *performativity* through noise as the noisiness produced by the projector's body, the next generation of artists was inspired to use the productive elements of the projector to create new forms of noises through experimental cinematic processes—specifically using the projector's noises to produce synthetic sounds—which I explore in the next chapter. While Ginna and Corra's projector performances situated the projector as a visual noise instrument (and may have influenced Russolo), Russolo's theory of noise and his *intonarumori* performances directly led to the conception of optical synthetic sound composition and to the use of the *projector* as an *acoustic noise instrument*.

Chapter 3

Synthetic Noise Film:
The Rise of the Projector's Voice with the Transition to Sound-on-Film Technology

3.1 Introduction

The second transitional moment in this history of the projector's noise that I will be looking at follows the introduction of optical sound-on-film technology in the 1920s. While in chapter 2, I examined how the Cinématographe was used as a noise instrument by Corra and Ginna as a means of expressing their ideas about abstract art and producing new and original content through the new medium of cinema, in this chapter I concentrate on the synthetic noises produced by the projector's voice (i.e. the original noises produced *by* the projector without external referent) as a consequence of the development of optical sound-on-film technology. In relation to my larger argument about the *liveness* and *performativity* of cinema, this chapter is perhaps the most difficult to ground because the process is less visible to the audience. Even though the projector is performing these noises, the audience is not necessarily aware that the noises are inherent products of the projector's live performance, or that there exists no external referent to the noises, only that they—the noises— sound strange (at least this has been my experience of how audiences react to synthetic sound film). While chapters 2 and 4 look at the use of the projector-as-noise-instrument *in front* of the audience, in this chapter, the projector operates away from the audience's lived environment and (perhaps) conscious knowledge. In this chapter, the projector has become a concealed instrument in the cinematic apparatus. As such, the experience of immersive cinematic space in synthetic noise film is more complicated than in instances where the projector is present in the environment of the audience and/or where the projector's voice is complemented by its bodily noises. This chapter deals with more abstract concepts relating to the projected arts and the role of the projector-as-noise-instrument.

The goal of this chapter is to explain how the projector's voice gave rise to "synthetic sound film," i.e., synthetic and original sound achieved by drawing images directly onto the soundtrack of a filmstrip that produce, through the projector, acoustic noise. In this chapter, I establish a history of the use of the projector as an instrument for the production of new synthetic noises outside the establishment of representation. First, I discuss the work of synthetic sound filmmakers who specifically employed this technique in order to produce original *noises* rather than mimic representational and/or reproduced sounds: Oskar Fischinger and László Moholy-Nagy (both pioneers in the creation of synthetic sound film), as well as Peter Kubelka (because of his emphasis on the projector's voice in the production of cinema) and my own work (because of my expansion on the earlier ideas about the projector's voices as an expressive language). This chapter serves to introduce how, through the projector's noise, even when concealed from the audience, the *performance* of the projector helps to engendered a liveness to (the experience of) cinema.

3.2 A History of the Projector's Voice

By the 1920s, the noisy body of the projector had been removed from many exhibition spaces and, as such, the conscious imprint of the cinema-going audience.[230] Ironically, in this concealment, away from the audience, the projector gained its voice—in a very literal sense. The late-1920s brought the film projectors the ability to read and amplify recorded sound through optical sound-on-film technology.[231] With this technological innovation, the *projector was given a voice*. And

---

[230] It should be noted that, while in the commercial arena, the projector became further removed from the experience of film, within avant-garde and non-theatrical film practices (i.e., within alternative screening sites) the projector was often still within the lived environment of the audience. As related in chapter 2, Russolo's noise instruments were often used to accompany early avant-garde films throughout the 1920s. In these performances the projector along with the *intonarumori* were present to the audience during the film's performance. Small gauge projectors, starting in the 1910s and 1920s, were also being marketed for home viewing.

[231] In the late 1910s and early 1920s, Lee de Forest (inventor of the audion tube, an instrumental part of radio technology—which also negatively affected the movie going audience with the popularity of radio

with this new voice, the projector came to provide the acoustic content of cinema. However, in

commercial practices, where the projector was considered a playback machine, the voice it was

granted was not given its own identity or agency. The projector spoke someone else's words, sang

someone else's tunes, and screamed of a time now past (insofar as the projector *reproduced* sounds

previously recorded without interjection, originality and/or providing anything "new"). As such,

even with this voice, the projector's labour and its role in the production of cinema became

increasingly invisible.

However, during this transitional phase, artists came to use the projector's voice as a means

of producing new and original sounds and noises, and in the process, not only re-established the

projector's role in the production of cinematic space, but the liveness and immersiveness of cinema.

Although I argued in chapter 1 that the *presence* of the projector in the lived environment of the

audience helped to engender a liveness and embodied experience of cinematic space, the removal

and the concealment of the projector did not necessarily negate this experience. Before optical

sound-on film technology, live musicians (from piano players in small-to-mid-sized movie houses to

live orchestras in the pits of grand theatres) provided acoustic accompaniment for the moving

---

dramas and the rise of mass entertainment at home) and Theodore Case (inventor of the Thallofide light sensitive vacuum tube) started to work on a method for recording sound onto the celluloid filmstrip. Triggering the end of their professional relationship, de Forrest released a system under the name Phonofilm, giving no credit to Case. Case retaliated by teaming up with the Fox Film Corporation and branding his own sound-on-film system—Movietone. Both systems relied on the same principles still used for optical soundtracks: sound was transcribed into light and recorded into the emulsion on specific region of the filmstrip. After the film was processed, a visible soundwave would be present. That soundwave could then be read by a photocell (placed within the film projector itself), and translated back into an audible phenomenon. This method for achieving optical soundtrack is still used as a basic sound-on-film technology. See Douglas Gomery, *The Coming of Sound: A History* (New York: Routledge, 2005). Contemporary filmstrips can carry up to four different forms of recorded sound: an optical soundtrack in the area between the frame and the sprocket holes, a Dolby Digital soundtrack covering the celluloid between the sprocket holes, a Sony Dynamic Digital Sound (SDDS) soundtrack between the sprocket holes and the edge of the filmstrip, and a DTS timecode that triggers a paired external recording of the soundtrack (either on CD, DVD, CD-ROM or on a hard drive).

images.[232] The live performance of music engendered a sense of *liveness* to the experience of cinema. However, as movies became less popular (partly due to the rise in popularity of radio), movie theatre owners and film producers sought for a new way to draw in crowds and to cut costs.[233] Live musicians were expensive. Studios began investing more heavily on the development of synchronized recorded sound, culminating in the release of *The Jazz Singer* in 1928 (the first film with an entirely recorded soundtrack and sync dialogue).[234] What differentiated optical sound-on-film technology from other technologies of sound reproduction for film was that optical sound-on-film technology allowed for the perfect synchronization of sound and image, which, in turn allowed for dialogue and diegetic sound. Optical sound-on-film technology, as such, gave birth to the Talkies. Recorded voice displaced live music as the dominant soundtrack of cinema.

As I will establish, not only was the filmstrip and the projected image given voice with optical sound-on-film technology, so too was the projector. For my exploration of the projector's noises, this is key: with optical sound-on-film technology came the ability of the projector to create new and original sounds. While the projector's voice was primarily used to *reproduce* sounds, this ability to *speak* also gave the projector the ability to *produce* synthetic sounds (sounds that only existed as a product of the projector as a noise instrument, through act of projection). The projector could

---

[232] Again, Rick Altman's work on the myth of "silent cinema" should be consulted for further reference on this subject.

[233] This desire to re-invigorate the audience for commercial theatres is not unlike similar moves motivated by the rise of new communication technology, like the rise of television and the development of Cinerama and Todd-AO, or the rise of online streaming and the (re)development of 3D movies.

[234] To be clear, *The Jazz Singer* was not the first film to employ recorded sound technology, but the first to have an entirely recorded soundtrack that included a lot of dialogue. Different companies from the 1900s to the 1920s in order to try and capture recorded sound to accompany the recorded images of cinema marketed a bevy of different machines. From approximately 1888 to 1915, Edison and his associates were actively pursuing a system that would marry the phonograph and motion picture called the Kineto-Phonograph. Leon Gaumont demonstrated a similar device called the Chronophone to the Sociétè Française de Photographie in 1902, but, according to Gomery, had abandoned the device by 1908. These hybrids were followed by the Cameraphone, the Cinephone, the Vitaphone, before Edison first released his talking Kinetoscope in 1913. Gomery, *The Coming of Sound: A History*, 24-28. These apparatuses consisted of a gramophone synced up to a projection through a system of belts and gears. These devices were difficult to keep in sync, which meant that sequences with extended dialogue were not possible because they could not be successful exhibited in sync.

now read, translate and speak any visual symbol, or rather anything at all placed on the soundtrack that blocked light. This added another level to the potential of the projector to be a noise machine. Not only did the projector's body generate noises, but also now artists could use the projector to generate optically-based electro-acoustic music.[235] For the avant-garde, this technological innovation had the potential to be a game changer.

Within the projector's voice (specifically its *synthetic* voice) existed the potential for relating the *liveness* of the event, by indicating, through the production of new noises, the active *performance* of projection (i.e., the projector's labour in the cinematic event). Optical sound-on-film technology affected the temporality of the cinematic event by standardizing exhibition practices insofar as the projector had to run as a specific speed for the optical (re)presentation of both visual and acoustic content. This standardized speed—twenty-four frames per second—would mark the mechanical rhythm of sound film for the next century, for it was the best, most realistic speed to allow for an accurate amplification of both visual and acoustic content simultaneously read from the same filmstrip).[236] With the standardization of the act of projection, the liveness of the cinematic event became (perhaps) more apparent in the minutiae—through the *noises* that reminded the audience of the material conditions of their experience. For example, anything that obstructed this standardized aesthetic of projection would now be more noticeable. In both the visual and acoustic fields, scratches, dirt, dust and even splices/splicing tape disrupt the illusion of the screen space and refer the audience back to the materiality of the filmstrip and the live labour of the projector. The referential quality of these expressive noises provided the necessary critical distance required for an awareness of the immersive potential of cinema (i.e., a conscious understanding of the tension between the lived experience in the theatre and the imagined screen space). The noises on the

---

[235] In a sense, the projector became a sort of *intonarumori*.

[236] The silent speed of cinema, sixteen frames per second, was too fast for a natural sounding reproduction of sound and/or voice. Twenty-four frames per second offered the best compromise for an adequate amplification for a projected image that did not flicker and a soundtrack that did not warble.

soundtrack disrupted the illusion of the screen space and potentially returned the audience to the *idea* of cinema as a projected art.

Turning back to my history of the artists who exploited these potentials, I will show how the projector's newly developed voice offered a new means of imagining film and producing film, specifically as a noise instrument and as a producer (rather than as a mechanism of reproduction) by considering the projector for *productive creation*. As discussed in my introduction, according to Moholy-Nagy's definition, whereas *reproduction* refers to the mimetic replication of an external reality (i.e., "reiterat[es]…relationships that already exist"), productive creation refers to "art practice[s] that employ technology to actively create new relationships."[237] This chapter specifically explores artists who have employed the projector's noises for the productive creation of synthetic noise films. It was the ability of the projector to read and translate any visual script into an acoustic representation that first attracted Fischinger, Moholy-Nagy and myself to synthetic sound film. As I will soon explore, Fischinger realized that synthetic sound film could release what he called the "sound spirit" of a visual object. Similarly, Moholy-Nagy realized that he could further develop his idea of "groove-script" using this new technology and expand his ideas on using technologies of reproduction for production creation. For Kubelka, synthetic noise was a way to illustrate the language of cinema. I became interested in the technique because it offered a means of "reading" the written word as a visual symbol rather than an abstract signifier. In each of our approaches, however, the materiality of the medium is highlighted, either through the direct objectness of the filmstrip, or in the material reading of an abstract signifier (like written language and meaning). With regard to the acoustic phenomenon of synthetic noise, the technique through which it is produced can also be understood as the exteriorization of internalized space—the translation of the formal essence (understood as the

---

[237] Michael William Jennings, "The Production, Reproduction and Reception of the Work of Art," in *The Work of Art in the Age of Its Technological Reproducibility and Other Writings on Media*, eds. Michael William Jennings, Brigid Doherty and Thomas Y. Levin (Cambridge, Massachusetts: Harvard University Press, 2008), 11.

spirit, rhythm and/or energy) of the material object into pure sound, that is sound with no material or referential origin in nature.

3.3 Synthetic Noise

I have chosen to create a new term—*synthetic noise film*—in order to better describe a type of synthetic sound film that deals specifically with the production of noise. As I explained in my introductory chapter, synthetic sound film refers to any film that uses the technique of transcribing sound (that has not been recorded) directly onto the soundtrack of the filmstrip. This can include any kind of "image" or "symbol" created by hand (or sometimes by machine)[238] as long as the transcribed sound was not recorded and mechanically reproduced onto the soundtrack. Historically, the technique has been referred to as either synthetic sound or animated sound. The term animated sound places emphasis on the labour of the filmmaker and the field of inscription, while synthetic sound suggests the labour and expressive quality generated through the performance of the projector.

While the acoustic phenomena produced through synthetic sound film were *new* and *original* productions by definition, artists often employed the technique to achieve naturalist and/or representational sounds (i.e. to simulate music and/or musical sounds). As such, my criterion for choosing artists was based on the *intentionality* in their use of the technique. For example, artists like Rudolf Pfenninger and Norman McLaren (who were both intrinsic to the development and

---

[238] The use of machines for the production of synthetic sound is highly controversial. Purists believe that synthetic sound *should be created by hand*. The argument is tricky. Some, like Levin, feel that Pfenninger is the primary example of a synthetic sound artist, because of his hand-drawn practice and the extent of the sounds he could produce. But Pfenninger *traced* the mechanically recorded and reproduced soundtracks of other films to produce his acquired sound library. So his sounds were hand-drawn, but originated from recordings. Fischinger, on the other hand, hand-drew graphic symbols, which he then rephotographed onto the soundtrack (which Levin insinuates is less authentic then Pfenninger's method). I use a computer and a printer to create stickers which I then place by hand on the soundtrack. I am of the mind that anything that is not a reproduction of recorded sound should be considered synthetic sound (which does mean that I am somewhat apprehensive about Pfenninger's work).

176

proliferation of the synthetic sound film) have used this technique not for the production of new

synthetic noises, but as an inexpensive means of reproducing and/or emulating recorded sound.[239]

Pfenninger, who is believed to be the first to experiment with exact notation in animated sound,

isolated the sounds he desired for his films on the optical soundtrack of commercial filmstrips,

traced their waveform, and reproduced the shape on his own filmstrips.[240] Pfenninger was not

interested in producing synthetic noise; instead he used the animated sound technique to recreate

representational sounds. Similarly, McLaren, who often combined synthetic and recorded sound for

his films, was less interested in *noise* per se, than the potential to recreate known, palatable and

pleasing tones through the technique.[241] However, artists like Fischinger, Moholy-Nagy and myself

have taken a more theoretical approach to synthetic sound film, and used the technique to produce

new synthetic noises as a type of research-creation (putting our theories about the correlation of

sound and image production into practice while challenging the reproductive nature of film

technology). Because of this nuanced distinction, I feel it necessary to create a term (i.e., synthetic

noise film) that refers specifically to synthetic noises (as opposed to sounds or voices) in order to

---

[239] Recorded sound, in traditional film practices, is transferred into an optical waveform that is then printed on the soundtrack of the filmstrip. The process for transferring and printing the sound on the filmstrip is very expensive, and the technique of synthetic sound film was employed to reduce costs. Another example of the use of this synthetic sound technique for non-noise or artistic purposes is E.A. Humphries's use of it in 1931 to change the name of a character in an early "talkie." In the Humphries case, a studio-made narrative film used the name of a powerful aristocratic family in a disparaging way, and, in order to avoid embarrassing said family, the studio forced the name change in the film. Instead of re-recording the entire soundtrack, Humphries used the soundwave of the new name to trace over the old on the optical soundtrack. This was a taxing, but effective way of sound editing. See Thomas Y. Levin, "Tones from out of Nowhere," in *New Media, Old Media: A History and Theory Reader*, eds. Wendy Hui Kyong Chun and Thomas Keenan (New York: Routledge, 2006), 45-46.

[240] See Levin's "Tones Out of Nowhere" for a comprehensive history of Pfenninger's practice. Moholy-Nagy also attributed the origins of precise notation in animated sound to Pfenninger. However, Moholy-Nagy claims that he was the first to think and promote of "synthetic music production" in his articles in "*De Stijl*" (July 1922) and "*Der Sturm*" (November 1922), as written in *Vision in Motion*: 277.

[241] The decision to not look at McLaren's work was difficult, for he is the most prolific synthetic sound artist of the twentieth century. But McLaren felt strongly that his work should appeal to the widest audience possible. As a filmmaker at the NFB, his position was supplemented by tax dollars, and he felt an obligation to his funders, the people of Canada. For this reason, while his technical prowess was extraordinary, his work veered from the categorization of *noise*. It was much more accessible.

more accurately describe the practice and to more precisely distinguish the intentionality between

sound and noise production.

The mythology surrounding the first synthetic noise film is thick and the history is decidedly

murky. Thomas Y. Levin's well-researched "Tones from out of Nowhere" definitively situates

Pfenninger as the first person to create a synthetic sound film although Moholy-Nagy was the first

to *imagine* and *theorize* its potential. Moholy-Nagy began writing about the idea of synthetic noise in

the early 1920s, with the publication of his essays "Production – Reproduction" (1922) and "New

Form in Music: Potentials of the Phonograph" (1923). Fischinger also wrote a manifesto on

synthetic sound, "Klingende Ornamente" ("Sounding Ornaments") first published in *Kraft Und Stoff,*

Deutsche Allgemeine Zeitung on July 28, 1932. Levin suggests that Fischinger made and screened

Ornament Sound Experiment (first screened in the summer of 1932) before Moholy-Nagy made and

screened *Tönendes ABC* (first screened in 1933). Very little documentation currently exists on

Moholy-Nagy's film (the film itself has been lost or destroyed), but common mythology among

most contemporary avant-garde filmmakers holds it as the quintessential synthetic noise film.

Conversely, *Ornament Sound Experiment* still exists (in fact, the Center For Visual Music is currently

preserving it). However, while Moholy-Nagy was seemingly open about his practices, Fischinger was

less than forthcoming about his film methods, to the extent that he disguised his techniques for

synthetic sound from the public to the extent that he staged a newspaper photograph showing huge

scrolls of "synthetic sound patterns" complete with a fake work force when he never used this

specific method or workforce for producing his synthetic soundtracks.[242] Without looking at the

filmstrip, I cannot say for certain if the reports given by Fischinger about *Ornament Sound Experiment*

were in fact accurate. Whatever the case, there is enough written documentation to produce

imagined reconstruction of both these seminal works—to reconstruct in our imaginations how they

---

[242] William Moritz, *Optical Poetry: The Life and Work of Oskar Fischinger* (Bloomington, Indiana; Indiana University Press, 2004), 43-44.

may have sounded. And, while my exploration does not hinge on pinpointing precisely the order of things but serves instead to outline the historical moment in which the practice was conceived, both films were created around the same time: 1932 (a short four years after the commercial standardization of optical sound-on-film technology).

3.4 Synthetic Noise Film: Oskar Fischinger

I cannot definitely state that Fischinger himself *viewed* the projector as a noise instrument. However, Fischinger inspired a revolution in the conception of noise-as-music through his relationship with John Cage, and through his exploration of the materiality of sound through synthetic noise film. Fischinger's experiments with synthetic sound production grew out of his ideas on the essence of objects. Fischinger believed that every object had a "sound spirit" (a theory I will expand on shortly). He shared this idea with Cage, who years later became one of the most important American sound theorists of the twentieth century. As I will shortly discuss, in "The Future of Music: Credo" (1958), Cage would take Fischinger's idea and theorized the potential of the projector as a noise instrument *because* of its ability to *play* synthetic noises. For this reason alone, on top of his (likely) moniker as first creator of the noise-driven synthetic sound film, Fischinger is an important person in my analysis of the projector as a noise instrument because he was one of the first to really appreciate the potential of the projector's noises.

As a filmmaker Fischinger was extremely interested in the musicality of film, and specifically in the potential of cinema as visual music. Yet he refers to his synthetic sound film as "ornamental," not as music. This distinction deserves attention. While in "Sounding Ornaments," Fischinger never refers to noise or the noisiness of the sounds he generates through the projector, he begins his essay by distinguishing between his projector noise practice and traditional music. As he states:

> Between ornament and music persist direct connections, which means that
> Ornaments are Music. If you look at a strip of film from my experiments with

179

synthetic sound, you will see along one edge a thin stripe of jagged ornamental patterns. These ornaments are drawn music—they are sound: when run through a projector, these graphic sounds broadcast tones of a hitherto unheard of purity, and thus, quite obviously, fantastic possibilities open up for the composition of music in the future.[243]

As ornaments (which he defines as embellishment and decoration to a musical structure), the sounds created could be considered within the musical spectrum, but not necessarily as music in and of themselves. In this statement, Fischinger makes it clear that he is imagining his synthetic noise practice as an absolute art form—similar to the theory behind Ginna and Corra's use of the projector explored in chapter 2. The synthetic noises he produced, to his mind, were the translation of pure energy (which is why they could produce "tones of a hitherto unheard of purity").[244] The filmstrip became the conduit, and the projector the instrument which read and transformed the object into energy and then that energy into sound. It is unclear if Fischinger ever intended to explore the potential of his ornamental soundings as a form of music. The only synthetic noise film he made, *Ornament Sound Experiment*, was just that—an experiment or first step towards what he described as the future of music.

In *Ornament Sound Experiment*, Fischinger photographed strings of hand-drawn patterns onto the soundtrack of a filmstrip.[245] Neither Fischinger, nor the theorists who have written on this work, have analyzed the placement and structure of the graphics on his filmstrip, which would have affected the sound production. Did he simply place these visual patterns onto the soundtrack one after the other? Where they combined in an intentional way? How were the patterns spaced (this would affect the tonality as well as the rhythm)? These technical questions are crucial to the

---

[243] Oskar Fischinger, "*Klingende Ornamente*/Sounding Ornaments," in *Kraft Und Stoff, Deutsche Allgemeine Zeitung*, No. 30 (July 28, 1932), accessed October 9, 2012, http://www.centerforvisualmusic.org/Fischinger/SoundOrnaments.htm.

[244] Fischinger, "*Klingende Ornamente*/Sounding Ornaments."

[245] For an example of these visual patterns, please look at the photograph posted on the Center for Visual Music's website, accessed October 9, 2012, http://www.centerforvisualmusic.org/Fischinger/SoundOrnaments.htm.

reconstruction and/or imagining of his film. However, in "Sounding Ornaments," Fischinger does

describe a key component of his process, which has been overlooked. He describes his process as

follows:

> In reference to the general physical properties of drawn sounds, we can note that flat
> and shallow figures produce soft or distant-sounding tones, while moderate
> triangulation give an ordinary volume, and sharply-pointed shapes with deep troughs
> create the loudest volume. Shades of grey can also play a significant role in drawn
> music-ornaments. High-contrast definition of the wave form decisively creates the
> prevalent sound effect, but as long as one places such a "positive" (well-defined)
> wave somewhere in the foreground, one can simply overlay other wave patterns
> simultaneously by using grey shades for the secondary sound effects.[246]

According to his description, Fischinger combined the two different formats of optical soundtracks:

variable area soundtracks (where sound is recorded as a highly contrasted optical visualization that

looks similar to a soundwave) and variable density soundtracks (where sound is recorded as

greyscale "bars" on the soundtrack that look similar to a barcode, if a barcode contained not only

black and white, but also shades of grey). Both sound formats were read using the same technology.

The means of expression were the same, but the methods of inscription differed.[247] Fischinger seems

to be suggesting that, through synthetic sound film, by combining both formats one could produce

more complex sound compositions, an exciting proposal that I am fairly certain has never been

attempted elsewhere.[248]

---

[246] Oskar Fischinger, "Klingende Ornamente /Sounding Ornaments."

[247] In Europe (where he lived at the time) variable density soundtracks were the standard optical film soundtrack format, whereas in North America variable area soundtracks were the norm. Variable density soundtracks look like small, repeated rectangles of various shades of clear, grey and black. Variable area soundtracks look like soundwaves running along the entire length of the filmstrip and use only a contrast between a clear soundwave on a black background. Greyscale, however, is only a determinant in variable density sound (i.e., greyscale is not used in variable area optical sound). This disparity was inspired by the socio-technological and economic struggle between American and European commercial film studios (the Europeans did not want to rely on a technology owned and licensed by and American company, and vice versa). Eventually, variable area soundtracks won out, primarily because of their ability to produce clearer treble tones (typical of recorded dialogue).

[248] Alfred Hitchcock did use both variable area and variable density formats in *Blackmail* (1929), but not simultaneously. He did it to highlight the screeching cries in the knife scene (variable density produces better low tones, while variable area provides better treble at the expense of bass). He did not use variable

While much of Fischinger's structure and technique is unknown, his theoretical viewpoint on synthetic sound film is well documented. Fischinger's interest in these sounds came from a desire to understand the relationship between visual and acoustic phenomena. His focus was on the *translation* of the visual or graphic form into a sounding. Unlike Pfenninger, he was not interested in the production of a particular sound, but in how that particular graphic form would sound. In "Sounding Ornaments," he also makes clear that the goal of his experimentation was, like Ginna and Corra's, to create a new absolute art form through film:

> These music artists [synthetic sound filmmakers] must also be concerned with combining their musical compositions created in this new manner together with appropriate optical imagery. This should result in the potential for combination of sounding ornaments with visible filmic, spatial forms and movements. With that union, the unity of all the arts is definitively, finally achieved, and has become unquestionable fact.[249]

For Fischinger, the marriage of music and film would result in this absolute art form. In my view, this marriage is more akin to what Zielinski categorizes as technology of audiovision, which expands on the relationship between technology and perception, time and space, as much as sound and image. Fischinger's interest was first and foremost based on the potential of creating a *visual music* through the interrelation between music and film as temporal phenomena. Synthetic noise film was a short stop on his larger trajectory (as the name "Fischinger" would come to be almost synonymous with a genre of avant-garde film labeled "visual music"). However, in essence, at that moment in time, Fischinger was using the projector as an optical sound synthesizer, generating new tones that were *produced* by the projector from *visual* stimuli and had no natural or worldly acoustic referent— thereby concentrating on the role of the projector for acoustic production and rather than visual projection, and not specifically as an instrument for what has come to be thought of as visual music (which concentrates on the projector's visual production).

---

area and variable density simultaneously, but sequentially, one after the other. I am eager to research this point further, but would need to gain access to his original material.

[249] Fischinger, "*Klingende Ornamente* /Sounding Ornaments."

While Fischinger understood the novelty of this performative act of the projector, he was not inherently interested in the production of these new noises. Rather, he was interested in *what the noises represented.* Fischinger believed that synthetic sound film had the potential to release what he termed the "sound spirit" of objects. Every object had a distinct sound spirit based on its form and inherent energy. As such every object *sounded* differently. The projector, with its ability to translate optical shapes and forms and translate then into sounds, could release these sound spirits from their visual containers. According to Fischinger's wife, Elfriede Fischinger, Oskar first thought of the idea of sound spirits "when he was lying down in a darkened room [and] she dropped a key in the adjacent room; he recognized the sound as that specifically of a key, not a coin or a spoon or some other metal object – so might the form of the key correspond to a distinct sound?"[250] From this experience, Fischinger surmised that every object had an essential sound that could be released through energy transfer (by dropping, hitting rubbing, etc. the object). With the invention of optical sound film, Fischinger soon realized that the projector's newly acquired voice could provide a means of releasing, or at least translating, the spirit sounds of objects that were represented as images on the filmstrip.

The materiality of sound production, expressed through his experiments in synthetic sound film, led Fischinger to question if "the shape of a birch or elm leaf make different sounds, not only when the wind whistled around them" but also when read by the projector?[251] However, there is no evidence that Fischinger actually photographed *objects* on the soundtrack of his films (like leaves or profiles), which would have coincided with his original inspiration of releasing sound spirits from

---

[250] Moritz, 43.

[251] Moritz, 42. In this quote, Moritz asks if the leaf would sound the same "under the camera eye" when it was actually the projector that created the sounding, not the camera. Fischinger typically photographed his graphic drawings using a motion picture camera. However, while camera technology may have been used to record the ornamental soundings, it was the projector that generated the sound, not the camera.

their representational forms.[252] Instead, Fischinger worked exclusively with strings of abstract, geometrical patterns on the soundtrack, which he had photographed (and enlarged) in the image frame of the filmstrip in order to provide the audience with the simultaneous experience of the visual image and its accompanying sound. Because Fischinger dealt with repeated strings of his abstract geometrical patterns, the material issue of sound and image disjuncture on the filmstrip (the twenty-six frame physical difference necessary for sync sound in 16mm film and twenty-one frame disjunction in 35mm film) did not necessarily distract from his intention. Because of the design of projectors (and because the sound component was a later addition to an earlier design) the optical sound reader is 26 frames away from the projection gate in a 16mm projector and 21 frames away in a 35mm projector. This means that the frame which contains the sound information (in the soundtrack area of the filmstrip) is located approximately one second before the frame with the corresponding visual content. With Fischinger's repetitive patterns, while the graphic presented in the image portion of the frame may have differed slightly in position to the one in the sound frame, the visual and acoustic articulation of the form would have been almost identical and was, for all intents and purposes, accurately represented through the act of projection.

Fischinger relayed his idea of the sound spirit of objects to Cage, whom a mutual friend (Galka Scheyer) suggested might be capable of composing "challenging, modern music" for one of

---

[252] Later, filmmakers would use the principles of animated sound in order to generate a single image that formed the visual and sonic content of the cinematic experience. Examples of this can be seen in Lis Rhodes's *Light Music* (1975-1977), where the images (horizontal bands of light) were photographed to the edge of the filmstrip – thus generating both the visual field and sound field of the film, and Steve Farrer's *Ten Drawings* (1976), for which a filmstrip was cut into strips which were laid side-by-side so that the filmmaker could draw a graphic image onto them as if they were a piece of paper. The filmstrip was then reconstructed into its linear form and performed through a projector. See Nicky Hamlyn, "Frameless Film," in *The Undercut Reader* (London: Wallflower Press, 2003), 163-168. Similarly, in David Gatten's film series *What the Water Said Nos. 1-3* (1997-98) and *Nos. 3-6* (2007), the soundtrack and image field were created simultaneously – by recording the inflections and marks the Atlantic Ocean on lengths of submerged undeveloped/unexposed filmstock. However, in both of these examples, the sound and image would NOT be in sync.

Oskar's films.[253] Fischinger wanted to make sure Cage understood *film* before attempting to write a

musical piece for one of his films. Cage has stated that this relationship would inspire his own

expanded theory of music which was grounded in everyday sounds, noises and silence.[254] Cage was

brought in to help Fischinger make *Optical Poem* (completed in 1938). The film was a frame-by-frame

animation of a three-dimensional miniature, paper-based set. The myth of the encounter states that

after a few days of tedious work, Oskar, while smoking a cigar, fell asleep on set. The cigar dropped

onto the set, which consequently caught on fire. Cage procured a bucket of water to put out the fire,

but also managed to drench Fischinger's set and motion picture camera in the process. This ended

Cage's apprenticeship.[255] However, it is likely there was never a fire. Elfriede has stated that Oskar

would not have fallen asleep while working, nor would he have been smoking a cigar while working

on a film, since in 1938 they were still using nitrate filmstock.[256] During the apprenticeship Cage

recalls that "[Fischinger] said that everything in the world has a spirit which is released by its sound,

and that set me on fire, so to speak."[257] This statement may have been misconstrued to help

construct the myth.

Through Cage, Fischinger gained a place in the history of sound art. Cage's theories of

synthetic sound film (rather than Fischinger's) are often referenced by filmmakers and theorists as

the inspiration for later works.[258] While Fischinger was not himself inherently interested in noise,

---

[253] Moritz, 78.

[254] See John Cage's seminal book *Silence*, and his groundbreaking sound piece, "4'33" (1952).

[255] This story has been retold in many books including Kenneth Silverman, *Begin Again: A Biography of John Cage* (Evanstan, Illinois: Northwestern University Press, 2012), 24-25; R. Bruce Elder, *Harmony and Dissent: Film and Avant-Garde Art Movements in the Early Twentieth Century* (Waterloo, Ontario: Wilfred Laurier University Press, 2008), 26.

[256] Larry Janiak and Dave Daruszka, "Oskar Fischinger: An Interview with Elfriede FIschinger," in *Zoetrope: The Publication of Commercial and Experimental Media*, 3, (March 1979), accessed October 9, 2012 http://www.oskarfischinger.org/EFZoetrope.htm.

[257] John Cage quoted in Thomas Hines, "Then Not Yet 'Cage," in *John Cage: Composed in America*, eds. Marjorie Perloff and Charles Junkerman (Chicago, Illinois: University of Chicago Press, 1994), 91.

[258] For example, projector performer Bruce McClure who is discussed in chapter 4, acknowledges Cage's influence on his work, but does not discuss Fischinger in his history of noise. I have also referred to

Cage used noise as a platform to expanded upon Fischinger's ideas of synthetic sound. Cage's "The Future of Music: Credo" is almost universally quoted when discussing synthetic sound film. Yet, many of the ideas in "The Future of Music: Credo" were previously written in Fischinger's "Sounding Ornaments" (1932), including the potential of synthetic sound film to be as the future of music. Cage's passage reads:

> It is now possible for composers to make music directly, without the assistance of intermediary performers. Any design repeated often enough on a sound track is audible. Two hundred and eighty circles per second on a sound track will produce one sound, whereas the portrait of Beethoven repeated fifty times per second on a soundtrack will have not only a different pitch but a different sound quality.[259]

Fischinger's 1932 essay gives the same authority to the composer and proposes the same creative potential for synthetic sound film:

> A combination of any chosen sound-images is readily imaginable. The potential in this area is unlimited. But there are also other possible uses for graphic sound ornaments… The new methods introduced here offer new, fruitful stimulation that should be provocative to the whole musical world. Perhaps through the development explained here, the creative artist, the composer, will not only find a completely new way of working, but also he himself can simultaneously produce his creative expression in an indelible direct graphic which will be definitive in that he shall not be dependent on any reproduction by foreign hands, since his creation, his work, can speak for itself directly through the film projector.[260]

While Fischinger may not have specified the potential of noise, he recognized that the projector as a sound instrument offers the potential to produce any sound imaginable. He also recognized unimaginable *sounds*—those generated by the projector's reading of a visual sign translated into synthetic sounds—were noises particular to the projector that cannot be created by another instrument. Cage expanded on Fischinger's uses of the projector as an instrument to include the

---

Cage, though omitting his relationship to Fischinger, in my past research, specifically my Master of Arts thesis "The Site of Sound: An Exploration of the E/Affects of Intermedia Texts through Animated Sound Film."

[259] Cage, *Silence: Lectures and Writings* (1961; repr., Middletown, Connecticut: Wesleyan University Press, 1973), 4.

[260] Oskar Fischinger, "*Klingende Ornamente* /Sounding Ornaments."

production of new noises (which fit in well with his theory on sound, which expanded the range of "musical sounds" to include silence and noises).

Fischinger's interest in the soundings of visual symbols was criticized by Levin in "Tones From Out of Nowhere," where he suggests an argument antithetical to mine which elevates Pfenninger's work in synthetic sound while devaluing Fischinger's and Moholy-Nagy's. Levin suggests that Fischinger's exploration of synthetic sound was based on visual rather than acoustic production insofar as he was primarily interested in "the relationship between given graphic forms and their acoustic correlation."[261] According to Levin, this adherence to the visual produced *ornamental* soundings (i.e., sounds without inherent significance—a point that Fischinger himself would agree with), which, while interesting gimmicks, were not musical or inherently interesting to as sounds. In this sense, Fischinger was overlooking the potential for synthetic sound production as musical composition. For Levin, Fischinger was too focused on the visual to the detriment of the acoustic, while Pfenninger's work, which Levin supported, was more concerned with the acoustic result rather than the translation of visual or graphic imagery. According to Levin, Pfenninger's methodology and practice should be considered a form of electro-acoustic music played with the projector, while Fischinger's an accidental production of non-organized sounds. Levin continues by suggesting that Pfenninger's method of creating graphic representation *of* sounds "effectively *destroyed the logic of acoustic indexicality* that was the basis of all prior recorded sound" because "prior to Pfenninger all recorded sound was always a recording *of* something—a voice, an instrument, a chance sound" while Pfenninger "produces sounds out of nowhere."[262]

For me, Levin is both missing the point and diminishing the value of acoustic markers. While Pfenninger's sounds may not have had specific *material* referents, Pfenninger was simulating *meaningful* acoustic signs (notes, sounds, voices). Which is to say that, while synthetic sound film may

---

[261] Levin, 67.
[262] Ibid.

offer the semiotic rupture Levin describes, Pfenninger was producing acoustic indexicality through his simulation of the optical representation of an acoustic sign. Through graphic translation, he was transforming the shape of the material referents into new visual symbols for the production of *known* and *meaningful* acoustic values. Pfenninger was simply transcribing an "illiterate" signifer (i.e., a signifier that humans had not learned to read) from a literal signifier (a sound that signified an object). With regard to noise production, I find Levin's criticism of Fischinger problematic insofar as Pfenninger, while focused on acoustics, aimed to reproduce *known sounds* and adhere to standard forms of musical structure, while Fischinger probed the potential of the projector's voicing and/or translation of visual objects without assigned acoustic values. Fischinger was exploring the means of producing unimaginable sounds through graphic forms. Fischinger wanted to know how specific graphic representations (without a known accompanying acoustic signifier) *sounded*. This exploration (translating, shifting and re-appropriating meaning) seems to me more indicative of "*destroy[ing] the logic of acoustic indexicality*"[263] and restructuring/rupturing semiotic systems. To me, a dog's bark is as equal a signifier of the idea of "dog" as is a photograph of the animal. Levin's logic, however, suggests that the dog's bark, when *isolated* as a visual representation in the form of an abstract soundwave (an "illiterate signifier" to us), is somehow less indexical of "dog." At the same time, Levin is suggesting that an image of a dog or the word dog written on the soundtrack would produce a *more* indexical sound to "dog" (even though the projector's reading of the visual symbol produces in sounding that in no way indicates "dog") than a hand-drawn abstract soundwave that reproduces a dog's bark. For this reason, Fischinger's experiments were, in fact *more* grounded in abstract sound production (causing this rupture of signification) than Pfenninger's. Further, Fischinger's graphic translations were a better showcase for the expressive potential of the

---

[263] Levin, 67.

projector's noises insofar as the noises are evidence of the liveness of the projector's expression, which is to say of its labour as an instrument.

With regard to the meaning of synthetic sound, Levin also criticizes Fischinger's articulation of the technique, arguing that Pfenninger created his soundtrack using "discrete units" of hand-drawn sound. Levin stipulates that this again was more conducive for the production of a musical language, suggesting that Pfenninger was actually inventing a new system of notation of musical grammar.[264] Fischinger's use of continuous strings of repeated graphic figures produced "arbitrary" noises. As Levin states, "[t]o the extent that Fischinger's ornaments function semiotically, they do so as 'motivated signs,' whereas Pfenninger's curves depend, strictly speaking, on only the particular—and in the last analysis, arbitrary—properties of the selenium cell that is the basis of the particular optical cinema sound system he used to produce his sonic graphematics."[265] First, technically Levin is incorrect in his analysis with regards to temporality, continuity and the appearance of sound on the filmstrip; unlike the visual frame, the soundtrack of a filmstrip is not divided into discrete units. In fact, such a division on the soundtrack would be *heard* as an acoustic noise.[266] Although sounds are articulated as distinct units in a recording, on the optical soundtrack every distinct unit is held together, literally, by a continuous line (so as not to produce a jarring *noise*). Here, it seems to me that Levin is again placing too much value on Ferdinand de Saussure's concept of *langue* (the social language structures which govern the use of language that tends to privilege the written word over the spoken word) while diminishing the respective value of acoustic symbols as signs and *parole* (as an acoustic phenomenon and speech act). To me, both spoken and written symbols are equally weighted as signifiers. Levin seems to think that simply because it is not *visual*, it does not have a

---

[264] Levin, 68.
[265] Ibid., 69.
[266] For example, in my film *c: won eyed jail* (2005) the frame lines of the photographic images, along with the splices between still negatives, create an audible sound that marks sections of the film when projected.

natural or material value. Levin's emphasis on discrete units is symptomatic of his adherence to

known language structures, as it follows in the "proper" construction of sentences and linear, logical

meaning through this articulation of discrete units. By contrast, Fischinger's continuous strings of

graphic symbols would produce a continuous noise, without any spaces between sounds, which

could be considered as a more progressive exploration of filmic time, and more directly in line with

the Futurists exploration of duration (discussed in chapter 2).

The second concern Levin raises relates to the question of *authenticity* with regard to the

photographic representation of the graphic symbols on the soundtrack of a film as opposed to hand-

drawn soundtracks. He suggests that Pfenninger's method of hand-drawing his notation on the

soundtrack more authentic than Fischinger's photographic representation of graphic symbols. Levin

raises the same concern about Moholy-Nagy's film, specifying that Moholy-Nagy was careful to

adhere to the sound-image correlation on the print by placing the corresponding sound the

necessary frames ahead of the corresponding image.[267] The question of authenticity falls into the

larger discourse on technologies of reproduction in general, but again Levin's argument seems

shortsighted insofar as Pfenninger was attempting to produce a reproduction—to simulate a

recorded sound through his system of notation (he started by looking at a recorded representation

on a filmstrip, and then hand-drew that pattern on his own keeping a score card of that notation for

future use).

Fischinger and Moholy-Nagy, in contrast, were transforming the projector from an

instrument of *reproduction* to one of *production* by allowing it to *produce original and new sounds*. While the

sounds Fischinger and Moholy-Nagy created through the projector were tied to the visual object

inscribed on the film's soundtrack, the sounds themselves existed outside our language system—

they were not *understood* as referring to or indexical of the shapes they represented. In this sense,

---

[267] Levin, 71.

whether the images themes were photographed or hand-drawn, the *sounds* produced by the projector were not *reproductions*. Levin's definition of the authority of the artist in the making of the soundtrack (i.e., privileging the artist's hand in the production of the soundtrack over a photographic representation, even if a photograph of something hand-drawn), therefore, seems to miss the point of Fischinger's innovative use of the technology and *why* he was exploring synthetic film in the first place. Fischinger's use of the technique not only highlighted the performance of the projector but also brought the projector *into* the production of art by recognizing that the projector's labour could produce new abstracted sounds out of any graphic image. In this sense, the projector as an instrument *became* the technological extension *of* the artist's body. Levin does not recognize that Pfenninger's practice is also mediated, only not by a camera, but by a pen or a paintbrush. Instead of on the inscriptive nature of the camera, Fischinger brought focus to the projector as a noise instrument (as a productive creator) through his exploration of the sound-spirits of graphic symbols. For this reason he is an important part of this history of cinema through the projector. But it was Moholy-Nagy who took this argument into the discourse of film technology and who specifically discussed the use of the projector as a noise instrument for the production of synthetic noise.

3.5 Synthetic Noise Film: Moholy-Nagy

      For Moholy-Nagy, it was precisely the issue of reproduction that first attracted him to the projector-as-noise-instrument. A contemporary of Mondrian at Bauhaus in Germany, Moholy-Nagy first began researching the potential use of new media (specifically technology of mechanical reproduction) in innovative and non-traditional ways to produce new perceptual experiences in the 1920s. In turn, his interest in the projector, and its potential as a noise instrument, came out of this interest in new media. His interest in new media stemmed form his research on art, perception and the production of meaning. Moholy-Nagy, like McLuhan, believed that the role of the artist was to

train us how to understand the socio-technological potential of new media as extension of our

bodies, and thus, as means of negotiating our spatio-temporal surroundings. As he states:

> Man as construct is the synthesis of all his functional apparatuses, i.e., man will be most perfect in his own time if the functional apparatuses of which he is composed—his cells as well as the most sophisticated organs—are conscious and trained to the limit of their capacity.
>
> Art actually performs such a training—and this is one of its most important tasks, since the whole complex of effects depends on the degree of perfection of the receptive organs—by trying to bring about the most far-reaching *new* contacts between familiar and the as yet unknown optical, acoustical and other functional phenomena and by forcing the functional apparatuses to receive them. It is a specifically human characteristic that man's functional apparatuses can never be saturated; they crave ever new impressions following each new reception. This accounts for the permanent necessity for new experiments. *From this perspective, creative activities are useful only if they produce new, so far unknown relations.* In other words, in specific regard to creation, reproduction (reiterations of already existing relations) can be regarded for the most part as mere virtuosity.[268]

As such, for Moholy-Nagy, media and technology were part of the larger rubric of "functional

apparatus." Through artmaking, the artist was able to eke out new relationships between our bodies

and our lived environments and to explore how new technologies inform new relationships between

the experience of space and the production of meaning. The projector in this sense was capable of

producing new relationships of time and space, but also could be used to actively produce synthetic

experiences and synthetic artworks.

The connection between new media and perception, and art as a training device for sensory

learning, lead Moholy-Nagy to believe that "since it is primarily production (productive creation)

that serves human construction, we must strive to turn the apparatus (instruments) used so far only

for reproductive purposes into ones that can be used for productive purposes as well."[269] In order to

do so, he suggests that we pose three fundamental questions about any new medium (which are

---

[268] Moholy-Nagy, "Production—Reproduction," in *Moholy-Nagy*, ed. Krisztina Passuth, trans. Éva Grusz et al. (London: Thames and Hudson Ltd., 1985), 289.
[269] Moholy-Nagy, "Production – Reproduction," 289.

highly pertinent to my research, but also can be applied to the examination of any current new media, like the internet and/or virtual reality):

> What is this apparatus (instrument) good for?
> What is the essence of its function?
> Are we able, and if so to what end, to extend the apparatus's use so that it can serve production as well?[270]

From these three fundamental questions, he believed that we could explicate how to best employ an instrument for *productive creation*. As these questions illustrate, Moholy-Nagy takes a materialist and/or socio-technological approach to media studies, with a specific *role for the artist* in unlocking media's potential uses and applications. With regard to the application of productive creation in film, Moholy-Nagy imagined the essence of cinema through the projector—as a technology that mediated the cinematic experience. As such, within his analysis of cinema, Moholy-Nagy articulates a distinct socio-technological break between the silent projector and the sound projector. While the silent projector was capable of producing "kinetic relationships of projected light,"[271] with the advent of optical-sound-on-film technology, Moholy-Nagy revised the function of the projector to one for the *productive creation* of synthetic noises. Moholy-Nagy realized immediately the potential of projector as a *noise* instrument, capable of producing new, otherwise unheard-of synthetic noises.

While Fischinger was interested in the idea of absolute art and the possibility of creating a visual music (which, as I previously discussed, he held in higher regard than his experiments in "ornamental soundings"), Moholy-Nagy, through his sound-script, was *not* trying to create something musical or based within the framework of musical composition. Rather, he used the projector's noise as a means of developing something entirely original, yet simultaneous in form, structure and voice. In this sense, Moholy-Nagy's exploration of synthetic sound differed greatly

---

[270] Ibid.

[271] Ibid*.,* 290. Moholy-Nagy also recognized the potential of the apparatus for the simultaneous creation of musical colours (giving the example of visual music of Walter Ruttman and the Clavilux of Thomas Wilfred).

from Fischinger's. In fact, Moholy-Nagy came to synthetic noise film through his noise experiments with another new medium of the period, the phonograph. The projector-as-noise-instrument was an extension of Moholy-Nagy's previous experiments with the phonograph as a mechanism for *productive creation* and, I believe, from his work as a typographer wherein he explored the materiality of the letter as a visual image. Through the exploration of phonography, Moholy-Nagy had previously developed a process-based practice for producing "groove-script" (what he described as a new language, based on the materiality of the medium, that allowed for the production of synthetic noises). Whereas Fischinger was focused on the *expression* of "sound spirits," Moholy-Nagy engaged more with the process through which the artwork was produced, and the ability, through that process, to produce noises with no external mimetic acoustic referent. The tension between reproduction and production was the theme that ran throughout his writing on technology.

Inspired by Russolo's *intonarumori*, Moholy-Nagy began to explore the potential of the phonograph for the productive creation of new synthetic noises in the early 1920s.[272] This experimentation centered on his concept of "groove-scripts" in which the grooves in a wax phonograph record were manipulated by hand in order to produce not only "a new means of expression" but also a "sound phenomenon…which carried no prior acoustic message, by the

---

[272] Along with Mondrian, Moholy-Nagy attended Russolo's 1921 concert series in Paris (discussed in chapter 2). In "New Form in Music: Potentials of the Phonograph," Moholy-Nagy specifically addresses this linage, referring also to Mondrian's critique of what he termed "Bruitism" (which, as far as my research suggests, the Futurists themselves never adopted) "New Form of Music and the Italian Bruitists" where Mondrian suggests that Russolo's noise instruments are not truly abstract or representative *enough* of the plastic arts. But Moholy-Nagy focuses on Mondrian's analysis and celebration of productive creation of "noises" in new music, quoting Mondrian's statement in "New Form of Music and the Italian Bruitists": "Music cannot develop through enrichment in terms of sounds or through refinement, but trough the abolition of the duality of the individual and the universe, the natural and the spiritual; in other words, the achievement of human equilibrium is the aim of all creation…Noises in nature result from simultaneous and continual fusion. By having partly destroyed this fusion and continuum, the music of the past has derived from this noise certain sounds which it has arranged in a certain harmony. In order to achieve a more universal mode of creation, the new music will have to attempt a new order of sounds and non-sounds (certain noises)." Mondrian quoted in *Moholy-Nagy*, in "New Form in Music: Potentials of the Phonograph," in *Moholy-Nagy,* ed. Krisztina Passuth, trans. Éva Grusz et al., (London: Thames and Hudson Ltd., 1985.): 291.

incision of groove script-lines as required."[273] He described his "groove scripts" as a language, which

must be fleshed out through the development of a material "alphabet" through which new

grammatical structures could be imagined and pursued. He viewed this new language as apocalyptic:

> By establishing a groove-script alphabet an overall instrument is created which
> supersedes all instruments used so far…Graphic symbols will permit the establishing
> of a new graphic and mechanical scale, that is, the creation of a new mechanical
> harmony, whereby the individual graphic symbols will be examined and their
> relations formulated with a rule. (We may allude here to an idea that sounds rather
> utopian as yet; namely the transposing of graphic designs into music on the basis of
> strict regularities of relationships).[274]

It was the marriage of the graphic and material nature of the groove-script against the unimaginable

phonetic results that really excited Moholy-Nagy. And this "groove-script" could be translated from

the phonograph to the sound projector—perhaps even more so, since the sound projector would

allow for the direct reading of the graphic symbol as an acoustics noise.[275] It is the way that Moholy-

Nagy imagines his groove-script as much as its material practice that is important to my exploration

of the projector's noises.

A close reading of "Production—Reproduction" establishes that Moholy-Nagy's strategy for

approaching the new media of mechanical reproduction for productive creation (i.e. the production

and/or creation of something new) was based on eliminating technologies of inscription from

production process—thereby providing more "human agency" (his words) to the production of the

artwork. In the essay, he discusses three technologies of reproduction: phonography, photography

and film. Moholy-Nagy suggests how to develop a phonograph art by manipulating the grooves of

wax plates by hand "without any external mechanical means, which then produce sound effects

---

[273] Moholy-Nagy, "New Form in Music: Potentialities of the Phonograph," 291.

[274] Ibid.

[275] While I am not addressing this issue here, the shift from phonograph to projector did have one
negative effect: the production of the groove-script on the record, as an exercise in graphic design, demanded
a *spatial* relationship between the material symbols and the ability to view the object as a larger design made
up of parts, whereas the projector turned the process into a visual exercise where the sound-scripts could only
be created as parts of a larger entity without necessarily seeing the whole picture.

which would signify—without new instruments and without an orchestra—a fundamental

innovation in sound production (of new, hitherto unknown sounds and tonal relations) both in

composition and in musical performance."[276] Similarly, with regard to photography, Moholy-Nagy

describes the photogram process as the productive creation alternative to the reproduction of the

camera and the use of our bodies to control the light that hits the sensitized paper. His final example

is film, but, at the time he wrote the essay, the projector had not yet gained its voice. As such, he

suggests that film is a medium for the "kinetic relationship of projected light" which would be best

served when the movement and motion of the projector instead of content within the recorded

images is highlighted. He refers to the abstract films of Viking Eggeling and Hans Richter (both of

which were shot, but showcase the movement of abstract forms) as well as the visual symphonies of

Walter Ruttmann (which were shot, but referred back to the musicality and performance of the

projector) and the Clavilus (colour organ) of Thomas Wilfred as examples of the potential of cinema

as productive creation.[277] In each of these descriptions, the *liveness* and *performativity* of the

technologies is emphasized.

This interest in movement was not overturned with the invention of optical sound-on-film

technology, but the discovery of the projector's voice shifted Moholy-Nagy's thinking about film

from a visual technology to an audiovision (a technology that marries visual and acoustic

phenomena, like television and cinema). In "Problems of the Modern Film," written from 1928-

1930 in the waking hours of the technological innovation of optical sound film, he stipulates that

> The sound film is one of the most important inventions of our time. It will enlarge
> not merely the visual and acoustic capabilities of mankind but also his consciousness.
> But the sound film I have in mind has nothing to do with the reproduction of the
> usual dramatic dialogue and sound sequences. Nor will its sole function be to
> provide a documentary record of acoustic reality.[278]

---

[276] Moholy-Nagy, "Production—Reproduction," 289.
[277] Moholy-Nagy, "Production—Reproduction," 289-290.
[278] Moholy-Nagy, "Problems of the Modern Film," 313.

As an early voice in the theory of sound film, Moholy-Nagy's position anticipates Sergei Eisenstein's writing on the need for the sound and image to work together to create a more complex and compelling composition, rather than simply mirror each other (which would distract from artistry of the film).[279] Sound film, according to Moholy-Nagy, should be considered "an entirely new vehicle of expression" which needs to combine acoustic and visual content "as mutually inter-dependent components of an indivisible whole."[280] As I will soon discuss, this emphasis on audiovision influenced the aesthetic of Moholy-Nagy's only synthetic sound film, *Tönendes ABC* (1932).[281]

Moholy-Nagy envisioned the potential of the projector (as well as the phonograph) to allow for a direct relationship between the composer and the audience. Like Fischinger, Moholy-Nagy viewed the liveness and agency of the musician as problematic. In his view, the composer, armed with the knowledge of the new notation system for direct sound production, could then compose and re-present his work without being "dependent on the absolute knowledge of the interpretive artist" whom, he complains, is "able to smuggle his own spiritual experience into the composition written in note form."[282] The possibility for technologies of mechanical reproduction to *express* the intentions of the artist in an unimpeded, unbiased and unmediated way impressed Moholy-Nagy as an interesting development in the production of art. But liveness of the event was not completely derailed by the removal of the musician from the production of music. Through the *playing* of the projector, a new relationship between the audience and the artist could be engendered. Further, the

[279] See Sergei Eisenstein, *The Sense of Film*. Adorno and Eisler make a similar argument in *Composing for the Sound Film* insofar as they insist most films slap music onto the visual composition (without considering the formal structures of the musical piece and/or the way the music and the images interact) to the detriment of the musical artwork.

[280] Moholy-Nagy, "Problems of the Modern Film," 313.

[281] The date of this film is somewhat contested. Gregory Zinman, in "Painting with Light" for the Museum of the Moving Image, suggests that the film was created in 1932 (Zinman, "Painting with Light," Museum of the Moving Image Moving Image Source, entry posted November 19, 2009, http://www.movingimagesource.us/articles/painting-with-light-20091119 [accessed October 9, 2012]). Levin states that the film was first screened in the UK in 1933, noting that this was after both Fischinger and Pfenninger had publicly screened their synthetic sound films (Levin, 72).

[282] Moholy-Nagy, "New Forms in Music: The Potential of the Phonograph," 291.

liveness of the production of sound (i.e., the fact that the sound could only be experienced and produced through the playing of the technology) also impressed a sense of *performativity* and originality to the act of amplification through the projector.

Moholy-Nagy immediately recognized the potential of optical sound-on-film technology for the production of a new relationship between technology, perception and meaning, as we can see from his only synthetic noise film, *Tönendes ABC*. Unfortunately, while Fischinger's work has been preserved (and photographic documentation of the work is widely available online), Moholy-Nagy's film has been lost and there is little documentation about its formal execution and/or the experience of the film. We can only imagine the film through vague descriptions provided primarily by Moholy-Nagy himself. In describing *Tönendes ABC*, Moholy-Nagy states:

> In an experiment, *the Sound ABC*, I used all types of signs, symbols, even the letters of the alphabet, and my own finger prints. Each visual pattern on the soundtrack produced a sound which had the character of whistling or other noises. I had especially good results with profiles of persons.[283]

While this description provides a window into the visual content used to produce the synthetic noise of the film, it does not illustrate *how* the graphic symbols were arranged on the filmstrip. In synthetic sound, the composition of the images, the way in which they are laid out on the filmstrip, is as important to the eventual sound production as the images themselves. The size and shape of the image object determines the pitch and tone of the sounding. Repetition of a similar shape is key for the production of a sustained tone. While Fischinger, we know, made sure to repeat the same graphic a number of times, Moholy-Nagy does not provide any information about how he structured his graphics, only suggesting that his experiments with synthetic noise produced "surprising acoustic effects."[284]

---

[283] Moholy-Nagy, *Vision in Motion* (1947; repr. Chicago: Paul Theobald and Company, 1965), 277.
[284] "The Present Problem in the Sound Film (1930)," *Moholy-Nagy, 314*. It is interesting to note that Moholy-Nagy discussed the use of *profiles* on the soundtracks—something that Fischinger never commented on, but that Cage also discussed in "The Music of the Future: Credo." It is also noteworthy that Moholy-

Moholy-Nagy's methodology mirrored Fischinger's insofar as he rephotographed the same graphic symbols in the image track and soundtrack of the filmstrip. Levin suggest that Moholy-Nagy was motivated to rephotograph the graphic symbols because he wanted to perfectly synchronize the two elements so that the audience could simultaneously perceive them during the film's projection.[285] The reason for this level of synchronicity was, as Moholy-Nagy theorized, if the sound and image were presented simultaneously, perhaps they would engender a new mechanical language. Ironically, with regard to phonography and cinema, Moholy-Nagy refers to the new mechanical language as a sound-script (the term he used post-sound film to refer to not only his phonograph language but also his sound-on-film language).[286] Within Moholy-Nagy's writing on typography there are keys to understanding his theory of sound-scripts. Moholy-Nagy was a typographer, and it is likely that, for this reason, he actively experimented with written letters as visual symbols on his optical sound-on-film. His ideas about the objectness of language and the subjective nature of language's material form could be better explored through the projector's noises than the phonograph's touch-based sound reader.

Language, specifically the meaning *expressed* through visual and/or graphic symbols, was fascinating to Moholy-Nagy. Through new media, Moholy-Nagy wanted to explore the potential for

Nagy specifically names the "profiles of persons" as one of the most effective images he used. Cage mentions the same graphic symbol in his description of synthetic noise in ""The Music of the Future: Credo," stating that "the portrait of Beethoven repeated fifty times per second" will have a different tone and pitch than that of one hundred and eighty circles (Cage, *Silence: Lectures and Writings* [1961; repr. Middletown, Connecticut: Wesleyan University Press, 1973], 4). Kahn suggest that Cage referenced Beethoven's head specifically as a dig at the tradition of western music, that the use of the "masthead of the symphonic repertoire was obviously parodic." Kahn continues: "A line drawing makes a poor death mask, especially for Beethoven, sine it fails to show where the bones and ears were removed during the autopsy to determine the cause of his deafness" but that "for Cage, the singular genius humbly assumes a position within the avant-garde musical materiality as on pitch and tone-color among an infinity of others" (Douglas Kahn, *Noise Water Meat*, 98-99). But too many artists used the same symbol for this to be a definitive explanation. The sounding of the profile was also explored by Boris Yankovsky in the 1930s in the USSR. It is curious that so many different artists gravitate to the same symbol, perhaps in an effort to humanize the synthetic noises of the projector, to return the voice of the reproduced image, in accordance with Adorno and Eisler's critic of the projected image? Was it an attempt to lay claim and/or agency over the mechanical production of the synthetic noises?

[285] Levin, 71.
[286] Moholy-Nagy, *Vision in Motion*, 277.

"the development of a mechanical language phonetically best suited to such instruments."[287] This

mechanical language, he imagined, would be read through "phonetic-mechanical" means rather than

"optical-typographical," comparing this shift to the effect of Gutenberg's printing press and the

perpetuation and impact of the written word on development of modern society.[288] Moholy-Nagy

speculated that this new mechanical language was a turning point in our collective histories that

signified the shift in economies of power from the book to the film/record. However, he also

suggests that, rather than "kill" print, the revolution caused by new media could inform the practice

of typography—that typography could be understood anew though the lens of new media (much

like this dissertation serves to re-present the film projector). He calls to make the practice of

typography more *pictorial*. He states:

> In the typographical material used so far (object-like) as an instrument only, there are
> now potential effects of their own (subject-like) existence to be recognized, i.e., it
> was taken into consideration that form, size, colour and layout of the typographic
> material (letters, symbols) may exercise a strong visual effect. The organization of
> these possible visual effects provides the content of communication with a visual
> validity; in other words, by means of printing, the content will be recorded pictorially
> as well. To support, strengthen, emphasize and, above all, *represent* this, is the actual
> task in creative visual-typographical work.[289]

As such, according to Moholy-Nagy, the written word would have to take on the properties of the

picture and/or graphic symbol to stay relevant in the twentieth century. Similarly, in reference to

Kurt Schwitters's sound poetry, Moholy-Nagy suggests that the only way for poetry to stay relevant

was to "to return to the elements of poetry, to noise and articulated sound, which are fundamental

---

[287] Moholy-Nagy. "Contemporary Typography—Aims, Practice, Criticism," in *Moholy-Nagy*, ed. Krisztina Passuth, trans. Éva Grusz et al. (London: Thames and Hudson Ltd., 1985), 293.

[288] Moholy-Nagy. "Contemporary Typography—Aims, Practice, Criticism," 293.While I am not sure that I would agree with Moholy-Nagy about technologies of mechanical reproduction leading to a more acoustic-based language system, I would say that modern technology has significantly changed the *visual* signification of meaning. For example, texting has had a vexing effect on the younger generation's ability to spell, to construct sentences, and to think about language as a formal system. Although still technically "written," text speak *is* much more phonetically based than formal written language. And typography, through text speak and electronic communication, has changed as well, perhaps most strongly by the invention of the emoticon.

[289] Moholy-Nagy. "Contemporary Typography—Aims, Practice, Criticism," 294-295.

to all languages."[290] *Tönendes ABC* can be looked at as an attempt to combine written language and the literary into a pictorial language through the material structure of the filmstrip. The film can be understood as an attempt at translating typography from the static position of the page into the dynamic movement of the filmstrip when performed through the projector. If noise was a fundamental element of all language, then it certainly served to explore Moholy-Nagy's intermedia experimentation.

In many ways, Moholy-Nagy and Fischinger had similar views of the *potential* of the projector as noise instrument: both spoke of the potential of new technologies to allow composers to become the "masters" of their work by (with Fischinger) avoiding the interference of musicians and (with Moholy-Nagy) avoiding the process of recording.[291] But Moholy-Nagy stresses the role of synthetic noise as an extension of *writing.* As Moholy-Nagy states:

> To develop creative possibilities of the sound film, the acoustic alphabet of sound writing will have to be mastered; in other words, we must learn to write acoustic sequences on the sound track without having to record real sound. The sound film composer must be able to compose music from a counterpoint of unheard or even nonexistent sound values, merely by means of opto-acoustic notation… The first sound film worthy of the name will be made by the artist who succeeds in discovering new types of acoustic expression which are convincingly appropriate both to the objects and the events, selected for the composition because of their relationships to one another.[292]

As this passage indicates, Moholy-Nagy's emphasis was on process, on engaging with the technology to create experiences otherwise unimaginable, only possible through the performance of the projector, but also the articulation of synthetic noise as a mechanical language. This language was

---

[290] Moholy-Nagy quoted in O.B. Hardison Jr., *Poetics and Praxis, Understanding and Imagination* (Athens, Georgia: University of Georgia Press, 1997), 273.
[291] This difference also implies a fracture in their thoughts about synthetic sound: for Fischinger and Cage, the end object of synthetic sound was the act of expression and the *performativity* of the process (i.e. the live *playing* of the composition) and for Moholy-Nagy it was the act of inscription (i.e., production of the original score).
[292] Moholy-Nagy, *Vision in Motion*, 277.

made possible only through the projector's voice—the projector's acoustic reading of the visual "signs, symbols, even the letters of the alphabet, and my own finger prints" as noise.[293]

After Fischinger's and Moholy-Nagy's first experiments, other artists followed suit (like Norman McLaren, Barry Spinello, Robert Russett, Richard Reeves, and myself) but synthetic noise film never really became and established technique or genre of the avant-garde cinema. Surprisingly, to this day, the unusual noises produced by the technique have not become understood, significant and/or familiar. My synthetic noises still generate nervous snickers from the audience, unaware of how to react to and how to process the synthetic noises they are hearing. Before describing my own synthetic noise filmwork, I need to introduce the work of Peter Kubelka into the trajectory of synthetic noise film, for he brings with him one of the loudest voices in support of the projector as noise instrument.

3.6 Synthetic Noise Film: Peter Kubelka

Kubelka is not often placed in the history of synthetic sound film, but the soundtrack of *Arnulf Rainer* (1958-1960) is one of the best examples of both visual and acoustic synthetic noise and the inherent noises of the projector of the twentieth century. Kubelka describes *Arnulf Rainer* as an absolute film, which for him implies that the work refers back to the formal structures and properties of cinema and the cinematic apparatus:

> I wanted to put cinema where it can stand with every musician and every painter. I wanted to be able to count cinema as a force which competes with these arts. Also, I wanted to get to the absolute basis of my medium, and to handle it as purely as was possible.[294]

Arnulf Rainer returns to the basic elements of filmmaking (the absence and presence of light) through its material construction as an articulation between black and clear leader (creating what P. Adams

---

[293] Moholy-Nagy, *Vision in Motion*, 277.
[294] Peter Kubelka, "The Theory of a Metrical Film," in *The Avant-Garde Film: A Reader of Theory and Criticism*, ed. P. Adams Sitney (New York: New York University Press, 1978), 156.

Sitney describes as "the alpha and omega, which both defines and brackets the art").[295] The black and white leader reflects the two extremes of cinema as a projected art: the black leader produces an absence of light when projected and the clear leader produces a maximum presence of light when projected. Although constructed using a recorded magnetic soundtrack, the structure of the film's sound mirrors the film's visuals. Kubelka used two acoustic extremes: the absence of sound (a completely "empty" piece of magnetic soundtrack, with no embedded signal) and the absolute presence of sound (a "continuous sound…called white sound [that] consists of all oscillations…I mean all frequencies, that is 10, 20, 30, or whatever comes out of the speaker.")[296] The reading of the soundtrack offers the same material extremes: the production of silence (black leader) and white noise (clear leader). It is unclear *why* Kubelka used a magnetic soundtrack when the same effect (with a more cohesive theoretical underpinning) could have been achieved using optical sound-on-film technology (i.e., having the projector read and amplify the black and clear leader in order to *produce* both the image and the sound). In all likelihood, Kubelka was accustomed to working with magnetic sound rather than optical sound (as the former was the more customary mode of sound inscription in Europe at that time) and he naturally gravitated to the use of that technology. He does specify that the "white noise" on the magnetic soundtrack was the "acoustic equivalent of the colour band of white light."[297] I would have done it differently, but I am not Kubelka, and there are currently different technical conditions that influence contemporary work (like the digital transition I will discuss in chapter 4 and the discontinuation of many filmstocks).

Unlike Fischinger and Moholy-Nagy, Kubelka was not interested in synthetic noise produced by translating a visual image or graphic symbol into a corresponding noise *through* the

---

[295] P. Adams Sitney, *Visionary Film: The American Avant-Garde, 1943-2000*. Third Edition (1974; repr. New York: Oxford University Press, 2002), 288.

[296] Peter Kubelka, "The Theory of a Metrical Film," in *The Avant-Garde Film: A Reader of Theory and Criticism*, ed. P. Adams Sitney (New York: New York University Press, 1978), 159.

[297] Peter Kubelka, "The Theory of a Metrical Film," 159.

projector's voice. Instead, Kubelka was much more interested in the projector itself as the producer

of the "essence of cinema," and in voicing the projector's inherent rhythms and noises, especially

the *visual noise* inherent to the projector's performance. Kubelka's theory of cinema, which he labeled

"metrical or metric film," was in fact based around the *performativity of the projector*. What is unique

about metrical cinema is how it emphasizes the labour of the projector and the projector's noises. In

fact, the two grounding ideas of metrical cinema are based on the projector's noise and the

performativity of the act of projection: first, that the base rhythm of is the product of the projector

(which carries an acoustic noise), and second, that the language of cinema is a product of the

projector's synthetic (visual) noises.

Kubelka's theory of the rhythm of cinema takes the analysis of motion and rhythm away

from the screen space and towards the projector, the projector's labour and the technology of

projection. As he explains:

> …when you let the projector run empty, you hear the rhythm. There is a basic
> rhythm in cinema. I think very few film makers—if there ever was one, I don't
> know—have departed from making films from this feeling of the basic rhythm, these
> twenty-four impulses on the screen—brrhumm—it's a very metric rhythm… You
> know what I mean by metric? It's the German expression "Metrisches System." The
> classic music, for instance has whole notes, and half notes, and quarter notes. Not
> frames as notes but time sections that I have in my films. I mean, I have no
> seventeenth and no thirteenths, but I have sixteen frames, and eight frames, and four
> frames, and six frames—it's a metric rhythm.[298]

According to Kubelka, the rhythm of film is *determined* by the speed of the projector—twenty-four

frames per second—from which the "timing" of the filmstrip can be measured.[299] This projector-

---

[298] Peter Kubelka, "The Theory of Metrical Film," 139-140.

[299] Kubelka's division, while mathematically logical, actually does not equate to *musical* time. By Kubelka's logic, as explained in the above quote, a twenty-four frame section of the filmstrip should be considered analogous to a whole note, wherein other musical times can be established (i.e., a half note would equal twelve frames, a quarter note would equal six frames, etc.). But the musical *timing* of a whole notes last longer than a second (and can shift depending on the speed of the musical piece). Which is to say, that musical time is less fixed than filmic time (the performance of the projector), and that to be analogous with musical time, the filmmaker must think about the filmstrip outside of the twenty-four frame per second base rhythm of the projector. That said, the abstract idea of the projector's mechanical rhythm as a divisible unit of

centric idea is accurate—for the speed of the projection is the one element in film that is constant.

The speed of the recorded image is altered by the technology of inscription (i.e., the camera, the

printer or digital effects in post-production). The exhibition of sound film is always *performed* at the

same speed. As previously described, what Kubelka calls the base rhythm of cinema, this twenty-

four frames per second beat, was a design characteristic of sound-on-film technology (because it was

the best, most realistic speed to allow for an accurate reproduction of both visual and acoustic

content simultaneously read from the same filmstrip). But for Kubelka, this expressive rhythm

should govern the conception and construction of the film, for it was the projector's rhythm that

brought the film to life. According to Kubelka, the filmmaker needs to use the projector's rhythm to

create a work of art.

The projector's rhythm for Kubelka was not necessarily an acoustic phenomenon, nor was it

irrevocably linked to musicality. Instead, for Kubelka, the projector's rhythm was translated to the

audience as a visual noise—a temporal disturbance—perceivable not in the illusion of motion, but in

the space between the frame. As Kubelka poetically phrases it, "*it's between the frames where cinema

speaks.*"[300] The noise—the product of the projector's labour—was indexical of the space between the

frames, which articulates the material rhythm of cinema. Noise, in this sense, is the synthetic product

of the articulation of cinema insofar as it is the *product* of the illusion of movement and the

projection of light in time. As Kubelka states:

> Cinema is not movement. This is the first thing. Cinema is not movement. Cinema is
> the projection of stills—which means images which do not move—in a very quick
> rhythm. And you can give the illusion of movement, of course, but this is a special
> case, and the film was invented originally for this special case. But as it often
> happens, people invent something, and, then, they create quite a different thing.
> They have created something else. *Cinema is not movement. It can give the illusion of
> movement.* Cinema is the quick projection of light impulses. These light impulses can

time offers an interesting approach to the understanding and production of cinematic time, and the
temporality of the experience of a film. It just is not a *literal* translation of a musical notation system.

[300] Kubelka quoted in Jonas Mekas, "Interview with Peter Kubelka," in *Structural Film Anthology*, ed.
Peter Gidal (1976; repr. London: British Film Institute, 1978), 99.

be shaped when you put the film before the lamp—on the screen you can shape it. I am talking now about silent film. *You have the possibility to give light a dimension in time.*[301]

It was not necessarily the act of the projector's light beam hitting the screen, but the articulation of that beam, the division of it into sections, that generated this temporal experience. This "breakdown" of the beam was produced by the intermittent mechanism of the projector (i.e., the mechanism which pulls down and holds each individual frame in place, in front of the light beam, and which operates at a rate of twenty-four frames per second). The intermittent mechanism controls the movement of the frame; it controls the space between the frames more so than the physical filmstrip. A frameless film, when projected, is "framed" by this mechanism of the projector. Although Kubelka does not say it overtly, it is the projector that *produces* the space between the frames. In this sense, it was Kubelka's theory of cinema as "happening" between the frames that grounded his idea of the projector as a noise instrument.

For Kubelka, the linearity of this temporality, which has been interpreted as the language of cinema, was an aspect of the *live performance* of the filmstrip. The meaning of a film was produced *through* the projection. As Kubelka explains:

> Where does film become articulate? When does language become articulate? Language becomes articulation when you put one word in front of another word. One word alone is one word alone, but when you put two words, it's between the two words, so to speak, that is your articulation. And when you put three words, it's between one and two, and between two and three, and then there is also relations between one and three, but two is in between… Where is, then, the articulation of cinema? Eisenstein, for example said it's the collision of two shots [montage]. But it's very strange that nobody ever said that *it's not between shots but between frames*. It's between frames where cinema speaks.[302]

The relation between the frames only becomes clear when the film is projected. Yet, the act of projection produces noises. Can it be deduced that these noises are inherent to the essence of cinema? The projector's visual noise was the essential ingredient in the invention of flicker film

---

[301] Ibid.
[302] Peter Kubelka, "The Theory of Metrical Film," 140-141.

which Noël Carroll and P. Adams Sitney both attribute to Kubelka.[303] In flicker film, the noise between the frames is given a synthetic form (as a colour, shape, visual effect) that does not materially exist anywhere but within the act of projection. However, Kubelka has only made two films that, in the strictest sense, can be considered flicker films: *Arnulf Rainer* (1958-1960) and *Antiphon* (2012). *Arnulf Rainer* and *Antiphon* not only share the same fundamental relationship between the articulations of frames; they are *articulations* of the same film. *Antiphon* is a direct print of *Arnulf Rainer*. As Kubelka explains:

> *Antiphon* is constituted by the same 4 basic elements of cinema, light and darkness, sound and silence, as is my film *Arnulf Rainer* but it has the opposite form. Negative becomes positive, positive becomes negative, silence becomes sound, sound becomes silence.[304]

In their ideal exhibition, the two films would be projected one after the other, then performed side-by-side, and finally shown in a single frame on top of one another. In this last configuration, not only would, theoretically, the simultaneity of the projected inverted images negate each other (creating a constant white screen), but so too would the noise of the filmstrips (created out of the aural articulation between the black and clear frames, which would provide a consistent white noise).

In order to understand this articulation between the films, we first have to understand the structure of the original film and its production of synthetic noise. *Arnulf Rainer* is perhaps one of the most complex films to describe, not because of its content or reception, but because it obliterates standard ideas about film. *Arnulf Rainer* exists as a three dimensional sculptural object (a tapestry made entirely of filmstrips that hangs on a wall, as well as a linear filmstrip that can be experienced as visual pulsations through the projection of the absence and absolute presence of the

---

303 Noël Carroll, "Defining the Moving Image," in *Philosophy of Film and Motion Pictures*, eds. Noël Carroll and Jinhee Choi (Malden, Massachusetts: Blackwell Publishing Ltd, 2006), 115; P. Adams Sitney, "Structural Film," in *Experimental Cinema Reader*, eds. Wheeler Winston Dixon and Gwendolyn Audrey Foster (New York: Routledge, 2002), 228.

304 Kubelka's description of the film *Antiphon* as it appears in the New York Film Festival's website, available online at http://www.filmlinc.com/nyff2012/films/monument-film.

projector's light, and now, as *Antiphon* a film that exists as a perfect opposite of the original filmstrip. When projected, the black and the clear leader serve to regulate the light beam into rhythmic sections, or visual increments, as the absence and presence of light. The synthetic soundtrack could have been produced the same way, for the articulation of black and clear leader translated through the projector's optical sound reader would have synthetically generated the production of silence and the loudest possible visual acoustic representation made by the absolute reading of light.[305] However, Kubelka opted to produce the sound using magnetic stock: editing together silent "empty stock" (the equivalent to the sound of black leader) and what he calls "white sound" (equivalent to the sound of clear leader).[306] He then translated the magnetic soundtrack into a variable area optical sound track (resulting in the visual reproduction of a recording of synthetic noise (produced with a synthesizer, although it has the some tonality and aural quality of synthetic sound film). Kubelka thereby creates a recorded magnetic soundtrack that was mimetic to the synthetic noises the projector would have produced.

The experience of *Arnulf Rainer* and *Antiphon* projected side-by-side would create a mirrored rhythmic pattern: the white frame projected on the screen would flicker from side to side, like watching the beating of a drum with the left screen as the left hand, and the right screen as the right hand. The soundtrack for each film would be amplified from the speaker on the same side of the

---

[305] Kubelka's treatment of the soundtrack has always perplexed me. The soundtrack *sounds* like an optical synthetic noise film. For years I believed it was. I have reproduced the same noises in my own experimentation with the articulated noises of black and clear leader. In watching *Arnulf Rainer*, it becomes obvious that the images and soundtrack are out of sync—more than the 26/21 frame physical disjunction on the filmstrip would produce. The sound and the image in *Arnulf Rainer* should consistently appear slightly out of sync. However, the rhythms between the sound and image are not consistent, producing noticeable different patterns at different times that are not the product of the projector's technical misalignment. The only way I can explain this disparity is that the soundtrack is not the unaltered re-presentation of the visual content—that it has been edited at some point. The idea that the film's soundtrack was edited in post-production is also indicated by the use of a mechanically *recorded* and *reproduced* variable area soundtrack. This *recording* would not be necessary if the soundtrack and the projected image followed the same structure and if he used optical synthetic sound rather than beginning with a magnetic soundtrack.

[306] Kubelka, "The Theory of Metrical Film," 159. He continues to define "white sound" as consisting of all oscillations and/or frequencies of sound, as a parallel to white light.

theatre as he corresponding projection. The audience would be privy to a kind of visual and acoustic assault, barraged by this stroboscopic performance of the projector. However, when projected in a single frame, on top of one another, the films would negate each other. Instead of the stroboscopic performance produced through the articulation between the black and clear leader, the audience would be treated to a constant white frame (the product of always having one of the projectors amplifying pure light while the other "projects" blackness).[307] For both the side-by-side and the single frame/screen performances, the experience of the soundtrack would remain the same. The differences in the experiences of these two films would instill in the audience a sense of the liveness and performativity of the projector even though the projectors themselves would be concealed (in the projection booth) from their view.

While not as obvious a choice for the analysis of synthetic noise produced by the projector as Fischinger and Moholy-Nagy (insofar as they both worked with the acoustic noises), Kubelka was a pioneer in the development of the projector as a visual noise instrument. Kubelka's illustration and/or illumination of the essence of cinema as the noisy space *between* the frames expands our idea of the projector by grounding the potential of the projector as a visual noise instrument. While the projector remains concealed from the audience, the ability to see visual noise and understand its significance as *noisy* may be greater than the projector's acoustic noise. Since so much of our focus on film is on the screen space (an inherently visual space) and film's output as a visual media, Kubelka's addition to the theory and practice of the projector as a noise instrument as well as his emphasis on the liveness and (visual and acoustic) productive creation of the projector's performance, follows in and informs the tradition of synthetic noise film started by Fischinger and Moholy-Nagy.

---

[307] As a sculptural object, when the "tapestries" of *Arnulf Rainer* and Antiphon are mounted together (i.e. the filmstrips of one film on top of the other), they have the opposite effect—instead of a "pure white frame" the combined tapestry become a black mass. The black leader cancels out or blocks the white leader, whereas in the projection, the white leader cancels out the absence of a projected image.

3.7 Synthetic Noise Film: Kelly Egan

My own work in synthetic noise film incorporates the ideas of Fischinger, Moholy-Nagy and Kubelka while expanding on the notion of language and the relationship between the graphic symbol and its accompanying acoustic noise. I was first introduced to synthetic sound film in early 2002 when I enrolled in a workshop on cameraless film taught by Canadian filmmaker Richard Reeves.[308] Before this workshop, I had never heard of synthetic or animated sound film. From the moment that Reeves first mentioned that you could *draw sound* on the optical soundtrack of a filmstrip, my world changed. This technique not only afforded me entry into the world of musical composition—somewhere I had not ventured since middle school—but would also allow me to develop and research some of my ideas about language and translation. Of course, I did not realize the full potential of synthetic sound film at that moment, but I intuitively knew there was something about this technique that spoke to me.

Because this dissertation is a research-creation project, I have completed five films during my doctoral studies, all of which relate to and inform my research on the projector's noises, and should be considered along with this written document: *transparent "c"*(2005), *c: won eyed jail* (2005), *from catalogs: wish list* (2006) with Penelope Umbrico, *A Firefly* (2007) with Souvankham Thammovongsa, and *ransom notes* (2011). I am currently working on a sixth film tentatively titled *(1000 words)*, which, although not completed, I will also discuss because it is pertinent to my argument.

Following in the tradition of Fischinger and Moholy-Nagy, my first experiments followed in the rudimentary interest in translating visual and/or graphic symbols into sounds. I drew shapes, letters, numbers and patterns on the soundtrack. I painted, pasted and scratched, to determine if these different methods of inscribing sound affect the tonality (they do). I tried to create sound

---

[308] Reeves's practice is very much in the tradition of McLaren, although the music he draws is grittier and follows in the tradition of electronic music (whereas McLaren was a disciple of jazz).

compositions, using the minimal amount of knowledge I had accumulated. The results were acceptable, but not extraordinary. I was very good at producing loud noises, clearly defined rhythms, and what sounded like percussive instrumentation. But I was a new filmmaker, having only first made the acquaintance of film production in the fall of 2001.[309] As such, it was hard to maintain my interest in one technique. I was about to leave synthetic sound film when I got the idea to inscribe an entire written narrative on the soundtrack and to use that narrative to guide the image content and structure of the film.[310] I took the inspiration for my first experiment in this method from the e.e. cummings poem "somewhere I have never travelled,gladly beyond," transcribing the words of the poem onto the soundtrack of a clear 16mm filmstrip. cummings's innovative tension between the formal adherence to poetic structure and play with syntax, grammar and punctuation had captivated my interests since my adolescence. "somewhere I have never travelled,gladly beyond" followed the rules of sonnet form, but played within these confines, and this was analogous to the way I wished to approach my film, following in the structural tradition of experimental cinema, but pushing the boundaries of the acceptable "language" of film. I created a system based on cummings's poetic structure and my own knowledge of synthetic sound production. I knew that the articulation of the words (the way they appeared together, and the spaces between each element) was as important to cummings (and to the production of synthetic sounds) as the words themselves. I still remember nervously awaiting the results. I had no clue *what* the words would sound like, how the projector would translate the written word. I still remember nervously crouching behind a chair, waiting with anticipation for the first sound. It hit my ears as the first image hit the screen. It

---

[309] I was first introduced to experimental film—to film production in general—when enrolled in R. Bruce Elder's Experimental Film Processes course in 2001, upon commencing my Masters of Art in the Joint Programme in Communication and Culture between York and Ryerson Universities. R. Bruce Elder opened my eyes not only to the materiality of the medium and the historical grounding of the avant-garde film, but the potential of film as art. For this I will always be grateful.

[310] I developed this process for the final project in a course Language and Narrative in Film Video and Multimedia, taught by Monique Tschofen in the summer of 2002.

sounded like a soft "tap" on a drum. It was the sound of the projector reading the word

"**somewhere**" (in Baskerville bold—the font I still use to this day). That tap was followed quickly

by another. And another. And another. And another, until the projector had "read" the entire poem,

through its own mechanical voice.

These sounds, this acoustic composition only "existed" in the timespace of the projector's

live performance of the film—there were no external referents for the noises. My interest in

synthetic sound was, simply put, to see *how* the projector would read the written word and what this

translation would mean to the audience,[311] a quest that was fundamentally flawed insofar as the

projector's "reading" was dependent on the arbitrary decision of font more than inherent

characteristics of the word and/or the letters themselves. I did understand this shortcoming, and

maintained the same font throughout the film in order to, at the very least, provide a constant

parameter from which the differences between the words themselves could be determined. In the

end, font and the physical length of the word made more of an impact on the sound the projector

produced than material or imagined differences between individual words. But to some extent, that

was part of my point about the arbitrariness of language and of the meanings we attach to words.

What is the alphabet but an abstract set of graphic symbols to which we assign arbitrary

significance? So why consider the arbitrariness of the projector's reading problematic?

In 2005, I made the short film *transparent "c"* in reaction to a few (very vocal) critiques about

the secretive nature of the narrative on my soundtracks. People were upset that they were not

informed of the words, of the story, of what the filmstrip said. I tried to explain that the "story" was

---

[311] Here, I was very much inspired by Stan Brakhage's theory of the material experience of the
spoken word. As Brakhage explains in "Poetry and Film," the rhythms and sounds of a language can carry
more significance, more feeling than the meaning of the words. He explains this theory with the example of a
spoken poem, of how a spoken poem can carry more meaning/feeling when heard in its native language then
when translated into another language. I wondered if the shape of written words and letters as graphic
symbols carried any innate acoustic meaning/feeling. I set out to find out if they did. Brakhage, "Poetry and
Film," in *Essential Brakhage*, ed. Bruce R. McPherson (Kingston, New York: Documentext, 2001), 174-175.

what inspired my decision for imagery and the general mood of the film. But they insisted my process "shut out" the audience from engaging with the film. To this day, I think quite the opposite, that providing the audience with the words, with the story, allows them to fall too far into the screen space, and does not allow for the critical distance necessary to look back at the cinematic apparatus and their position within it. To provide the audience a direct visual narration of the words, I felt, would turn the synthetic noises into a gimmick—a quick fix, like candy, that leaves the system without nurturing growth. *transparent "c"* was made by placing each letter of the alphabet in the image frame and soundtracks of the film so that the audience could simultaneously "see" what they were hearing. While my previous films had produced a fairly monotone percussive noise, to my surprise *transparent "c"* produced musical notes.

With the ability to translate written letters into musical notes, I was confronted with a decision: did I continue exploring the *noisiness* of the projector's reading of written words/narratives as graphic symbols or did I embrace the production of representational musical notes and/or understandable sounds, still using letters, but not words and not adhering to the grammatical properties of a written narrative? While making *transparent "c,"* I was also working on my first 35mm film *c: won eyed jail.* Unlike my previous work, *c: won eyed jail* dealt specifically with the idea of experimental and/or alternative narrative structure—particularly the possibility of feminine narrative and syntax through quilting. *c: won eyed jail* was at once a film and a quilt, which could be exhibited as a three-dimensional sculptural object (i.e., a quilt), or run through a projector and screened as a traditional film. For this project, I decided to expand my synthetic repertoire. I included both written narratives and repeated graphic symbols (traditional patterns used in quilting) on the soundtrack. I composed the soundtrack without knowing how the written words and the graphic symbols would sonically interact. I created the composition *visually* by producing a system based on the overall structure of the quilt itself. For example, if there were hand-stitched filmstrips, I placed words to

213

accompany the visuals. If there were still photographs, I placed graphic symbols. I knew I did not want to leave the "translated narrative" produced through the projector's noisy reading aspect of my film practice, but I also did not want to abandon the tonality and complexity I could now achieve by having the project "read" specific letters and/or shapes. I decided to synthesize the two.

Along with challenging the traditional experience and construction of cinema, *c: won eyed jail* also combine still and motion picture formats. I used still negatives in order to produce, through the projector, the *live* production of a visual collage. The different still images would be animated through the act of projection, melding together as the images hit each other on the screen. After seeing the *c: won eyed jail*, New York photographer Penelope Umbrico approached me to collaborate with her on a project. She wanted me to animate her old still negatives from the installation piece *From Catalogs* (1998). My role in the film truly would be that of a composer. Once I completed the visual composition (the editing of the filmstrip), I proceeded to conceive of and compose a synthetic soundtrack. I decided to try something new: because a large part of Umbrico's original project critiques consumption practices, I thought that the film would be best served if I were to complete a soundtrack using barcodes which were similar in structure and form to the visual representations used in variable density soundtracks (except the former were exclusively black and white, while the later contained grey tones). I had never *played* with variable density soundtracks and had little practice with the process (most of the films I had come in contact with used variable area soundtracks). The film fell flat, partly because the photographs were all of similarly blurred objects of similar colour (which meant there was little dynamic tension in the visual synthesis produced by the projector) and the soundtrack was, admittedly, sloppy. I was surprised at the representational nature of the synthetic noises produced by the barcodes when projected. At one point, I clearly heard car horns honking, traffic, and the noises of an urban soundscape. The representational nature of the sounds confused me. I *liked* the abstract noises produced by the words on my previous

214

soundtracks. I was much less interested in or compelled by this new ability to re-produce "real"

sounds through synthetic means. And I have yet to return to this process of making sounds.

The next major transitional phase in my use of written text in films came in 2007, when I

was commissioned to make *A Firefly* with Toronto-based poet Souvankham Thammovongsa for the

Liason of Independent Filmmakers of Toronto (LIFT) sponsored program "Poetry Projections."

While Thammovongsa was influenced by concrete poetry, and we shared a common interest in the

materiality and visual form of the written word, when making the film, for the first time I felt an

obligation to the words, to present them in a clear and meaningful way to the audience. The words,

as material objects, needed to be given a *liveness* that I knew I could achieve through the performance

of the projector. For the visual field of the film, I set the words in motion, creating what could be

described as a live concrete poem. For the soundtrack, while I did write out the poem for the

projector to read, I also focused on a few letters (the principle cast, if you will) within the poem: f, g

and i. Using these letters, I composed an acoustic score for the film by arranging repeated strings of

each letter directly onto the film's soundtrack. While the projector's acoustic noises (still) confused

the audience, the audience seemed to appreciate the ability to "read along" with the projector—to be

an active participant in the production of meaning by reading and interpreting the projected content

as they were being (acoustically and visually) presented by the projector.

I did not reproduce this active engagement for my next film, *ransom notes* (2011); it would not

have matched the mood of the piece. As I explain in my artist statement:

> "We have your …" The ransom note, in our collective imagination, is an interesting
> entry point to the politics of ownership, freedom and exchange value, made by
> transforming mass media (newspapers) content into a personal message – the re-
> appropriation of language and meaning through the act of collage. *Ransom Notes*
> explores this strange tension as a means of sorting out the filmmaker's experience of
> the hijacking of her city during the Toronto G20 Summit and subsequent riots of
> June 2010. The film combines new and old media (film, newsprint, print-outs of
> twitter feeds), exploring social mobilization through mass media, culminating
> through the structure of a "waltz." The soundtrack of the film is composed by
> placing letters, words and sentences directly on the optical soundtrack—in a sense

the projector is "reading" the words, and the sound that you hear is the language produced by the cinematic apparatus.

The feeling of siege I experienced at the time of the G20 Summit echoed my experience of language (and the written word specifically). I was struggling with my dissertation, with *this* dissertation, stifled by formal language structures and an insurmountable sense of being unable to direct my own words.[312] I wanted to explore the tension between chaos and structure, and achieved this through the visual and acoustic compositions of this film, using the projector's noises to anchor this tension. At the time I was fixated on the arbitrary assignment of letter values to musical notes, which I interpreted as analogous to the colour values assigned to musical notes in early colour organs and theories on synaesthesia. What if I created notes by writing the assigned letter on the soundtrack? Using the structure and notation of Dmitri Shostakovich's Waltz No. 2 from "Suite for Variety Stage Orchestra No. 1," I created a perfectly synchronized representation of the score within the image and soundtrack of my film (which when performed through the projector, sounds nothing like Shostakovich's original piece). In between these transcribed interpretations of Shostakovich's waltz, were noisy, chaotic sections of newsprint and paint, for which the soundtrack was produced by the projector's "reading" of twitter feeds of Toronto people caught up in the G20 riots.

With *ransom notes*, I exploited the acoustic potential offered by 35mm film and produced a stereo soundtrack in order to emphasize the spatial environment of the theatre. When working with 16mm film, as a filmmaker you have the ability to show your work whenever and wherever, as long as you have access to a portable 16mm projector (and a lot of us own 16mm projectors). When working with 35mm, that ability is diminished. Not many people own 35mm projectors—especially

---

[312] As I write this, I realize that in my films I relate the tension between my concept of order and chaos quite literally through the use of frame-by-frame animation and frameless animation techniques, respectively. In this sense, the presentation of the written word, when adhering to the structure of written language and the process of signification, also follows the normative language of cinema (I work within the frame, create visual phrases through syntactic structures, and am more included to produce "notes" on the soundtrack). When working with frameless, or "lawless" animation, I tend towards noisy soundtracks. Both are represented in *ransom notes*.

not 35mm sound projectors. Most 35mm projectors are in movie theatres, in projections booths, away from the audience (and often to the filmmakers as well). Perhaps because I felt that distance from the liveness of the projection, I wanted to generate a sense that the lived experience of the film was dependent on the physical location of the audience's body within the theatre space. The most effective way to do this, I thought, was though the production of two distinct acoustic channels. While the left side of the soundtrack was *playing* one thing, the right side would *play* something completely different. I achieved this by pasting different letters and different words on each side of the soundtrack. Conceptually, this serves as another way of exploring the projector's noises, but the audience would only be aware of *how* through a prior knowledge of my process.

As I complete my doctoral work, I am also in the process of finishing another film that showcases another transition in my work: the combined use of recorded and synthetic sound. I began *(1000 words)* in 2007 as an experiment in language, technology and network systems. I was interested in exploring further some of the more effective elements of my past films: the chance construction of a form-based narrative, the use of words as graphic symbols, and the projector's noisy reading of written language. Through university programme listserves and Facebook, I sent out a request for the donation of words that read as follows:

> i am in the process of making a new film and need your help. i would love it if you could send me a single word that will be incorporated into a film. like my previous work, this project will look at the construction of narrative through nonlinear forms, the pervasiveness and rationale behind ocularcentrism, individualism and the political economy of language, with emphasis on the process of making. (i'm still fleshing this all out).

> this project deals with possible narrative(s) that may emerge through chance operations---more specifically change communication. how will these randomly collected words "fit" together and create amongst themselves. the words will become the "skin" of the film. (i am a materialist filmmaker, meaning i work directly with the filmstrip, sewing, pasting, painting things onto the filmstrip itself). once collected, the one thousand words will be applied directly to the filmstrip, creating its structure, content and shape.

so please, send me your word! (no restrictions on the word, one word per person).
and if you know anyone who may have a word to spare, please pass this on!

My request asked for little information about the provider, but many people were eager to participate and to share their identities. As such, while my ethnographic information is completely uncontrolled, I do know that I received "donations" from Canada, the United States, India, and England. I did try to keep the donations from within my social network, by using my personal contacts for the original request. I catalogued the words as I received them, creating a database in Microsoft Excel, listing the word, the provider and the time/date of the donation.

When I began this project, I was interested in the narrative produced by chance, through the collection of disparate words through the space bending technology of the Internet. I was surprised by the logic of some of the articulations randomly collected, how words that were donated consecutively made "sense" (for instance, "poopy Diaper rash," "succinct create reason" and the beautifully poetic "sad prosthetic fever Solidarity Strength Together listening dog-eared smile"). I was surprised by the choice of words people sent and curious about what this collection said about our sociopolitical culture, about this moment in time. I was left with a rich source of material for this project, and for potentially many more to come.

More so than my previously described works, with *(1000 words)* I wanted to explore the tension between cinema as a technology of mechanical reproduction and an instrument for productive creation. I decided to combine rephotographed images and cameraless collage techniques in the image field, which would in turn combine frame-by-frame rephotographed animation and frameless cameraless animation. The two different techniques give layers of texture to the finished work, while at the same time directing the attention of the audience to the relationship between figure and ground in cinema (i.e., calling attention to the flatness/illusion of the screen space and the materiality of the filmstrip). While continuing to use synthetic sound—and specifically only full words on the soundtrack like in my early films—I also wanted to make sure that the audience could

figure out that what they were hearing was the projector's noisy reading (without spelling it out, like I did in *transparent "c"*). In keeping with the tension between the representational and the abstract, between reproduced and the produced, I decided to *record* a soundtrack featuring the spoken words (out of sync with their respective visual representations in the film). As the film progressed, the recorded/spoken words would be distorted by their written representations (i.e., I place the written words directly over the reproduced visual translation—soundwave—of the recorded sound). The final acoustic effect is that of the projector's reading of the "word" displacing the projector's reading of that word's abstract representation (the soundwave).

All of my films focus on language as well as the relationship between the written word (as a technology) and the production of meaning (as a socio-technological process). At the same time, all of my work looks towards the projector and its noises to inform my understanding of language. When I began working with synthetic sound film, I was not intending to explore the potential of a mechanical language, or to suggest a meta-phonetical sounding to the shape of the written word. Rather, I was interested in the *materiality* of language, in written words as *spatial* and *visual objects* instead of as loaded signifiers. This was inspired by my own critical reflection on the way I read and processed the written word as a dyslexic who visualizes print spatially rather than linearly. When reading printed text on a page, my eyes would process the words out of order randomly selecting words and reordering them while entirely omitting others altogether. The most accurate analogy I can provide for this experience is from McLuhan's Guttenberg Galaxy: he describes the different ways a (projected) film is perceived by members of a visual (literate) culture versus acoustic (non-literate) culture. In McLuhan's example, when presented with a film (as a projected moving image on a screen) members of a non-literate culture did not view the projected image as a whole, but instead focused on discrete parts within the frame. As McLuhan states:

> Literacy gives people the power to focus a little way in front of an image so that we
> take in the whole image or picture at a glance. Non-literate people have no such

acquired habit and do not look at objects in our way. Rather they scan objects and images as we do the printed page, segment by segment. Thus they have no detached point of view. They are wholly *with* the object. They go empathetically into it. The eye is used, not in perspective but tactually, as it were. Euclidean spaces depending on much separation of sight from touch and sound are not known to them.[313]

While I am sensitive to the divisionist language (i.e., the idea of "us" versus "them") within McLuhan's statement, the general idea is that the written word has brought with it a linear, detached, and separated point of view is valid—and exactly what early abstract art reacted against. I perceived the written word as a material object, as something tactile that *played* with the space of the page. Through film, I sought a means of expressing this materiality and objectness of language, which I felt came across through the noisiness of the projector's reading. Written words, through the projector, lost their position as signifiers; the projector read them based on their objectness (on their shape and form). I tried to engender tactility and embodiment to the experience of my films, if by no other means through the unknown and unrecognizable soundings produced by the projector's noisy voice. Through my material use of language in film, I tried to produce an acoustic space where figure and ground collapsed into each other while at the same time were mutually constituted.[314] The projector gave life to the film (which existed only as a static object without the projector's labour), but the film gave the projector the platform from which to express its own voice (which was otherwise charged with the expressing recorded sounds).

---

[313] McLuhan, *Guttenberg Galaxy*, 37.

[314] This idea is grounded in McLuhan's explanation of visual space as having "no basis in experience because it is formed of abstract figures minus any ground, and because it is entirely the side effect of a technology… In acoustic space, which involves the dynamic interaction of a figure as a part of its ground, each thing creates its own space; that is, it reshapes the ground even as it is shaped by the ground" (Marshall and Eric McLuhan, *Laws of Media* [Toronto, Ontario: University of Toronto Press, 1988], 40-41). Again, McLuhan's definition of acoustic space relates to my experience of the written word on the page. Through my films, I am trying to share that experience. By using the projector's noise and the material rhythm of language, I hope to engender an embodied *reaction* from the crowd, an awareness that something is *different* about the performance of my films, something is not being communicated in a linear or logical fashion, even if that feeling is only achieved through discomfort (through the projector's noises as disagreeable).

In this sense, my interest in projector's noises resulted directly from, on the one hand, my experimentation with synthetic sound, and the noises created—and only possible—through the projector, and on the other, my work as a structural, materialist and cameraless filmmaker interested in the role of the projector in the production of cinematic space. Like Fischinger and Moholy-Nagy, my semiotic interest in synthetic noise production came from and offered the option for a rupture in the process of signification through the use of graphic signifiers to produce arbitrary acoustic signifiers (unrelated to our current language system). As a cameraless filmmaker, the projector had also been my primary cinematic instrument. I always considered the projector's material presence when composing my films: the projector's rhythms, the projector's speed as well as the projector's noises. And as a filmmaker sensitive to the overruling structure of cinema with the desire to always point back to the cinematic apparatus, synthetic noise film offered me the potential to reference the projector, and the projector as noise instrument, through the experience of my films.

3.8 Conclusion

As this chapter has shown, the second major transition in the development of the film projector—the introduction of optical sound-on-film technology—offered artists new ways of *producing* noises. With the projector's voice came the potential of synthetic sound filmmaking, which in turn stressed the active role of the projector in the production of cinema. Further, because of the material properties of optical sound, the projector as a noise instrument helps to illustrate new forms of expression by calling into question existing language structures, the production of meaning, and the relationship between sound and image (through the combination of sound and image in film, but also to our understanding of visual and acoustic signifiers). While film had already been recognized as a technology of transformation (insofar as new lived environments could be simulated and explored through cinematic space), the synthetic noises produced through the projector's voice

emphasized the *liveness* of the projector's performance in the production of that cinematic space, and in turn, the *liveness* of the lived experience of the audience. As such, the production of synthetic noise through the projector as a noise instrument helped shift the temporal engagement of the audience.

Chapter 4

Projector Performances and the Noise of the Future: *Performativity* and *Liveness* at the Digital Transition

4.1 Introduction

In this chapter, I return to examine the use of the projector-as-noise-instrument, that is as an instrument for the creative production of visual and acoustic noise and as an instrument for the production of embodied or immersive cinematic space. In many ways, the artists and artworks analyzed in this chapter return to the projector performance experiments of Ginna and Corra (discussed in chapter 2) who considered the projector an extension of the colour organ and as a means of producing *live* abstract visual compositions. The two artists I examine in this chapter, New York filmmaker Bruce McClure and the collaborations of Montreal filmmaker Karl Lemieux and the Canadian independent band Godspeed You! Black Emperor, take the idea of the projector-as-noise-instrument a step further. First, they use the projector as a performative instrument to *playback* a pre-created filmstrip while additionally developing its potential to generate synthetic noises through this act of projection. Second, they exploit the potential of the projector to manipulate the filmstrip and projected image in real-time. McClure and Lemieux literally *play* the projector as if it were a noise instrument. These two examples are by no means the only contemporary instances of artists exploring the *materiality of the projector* and/or *cinema as performative* through the projector. What they share, however, is an emphasis on *noise* production through the projector, and an interest in considering the projector as a live musical instrument. The projector is taken out of the booth, and returned to the audience's lived environment. This placement of the projector (or more accurately multiple projectors) within the viewing space of the audience directs attention back to the projector as a key instrument in the production of cinematic space and to the dialectical tensions within the apparatus of cinema. The use of the projector as a noise instrument, played in the lived environment

of the audience, needs to be understood as a function of dominant cinema's transition to digital. The film projector can return to the viewing space only after it is replaced in the booth by digital cinema projection technology (hereafter D-Cinema). This displacement does not necessarily herald the "death of film," but engenders a need to redefine "film"—something that the projector performances of McClure and Lemieux speak to—and a desire to look at the difference between film and digital media in relation to projections (and to the projector itself) in the production of cinema.

In my Introduction, I discussed the current rhetoric surrounding the "death of cinema" in the digital age as an argument with a great deal of purchase in contemporary film studies that needs to be reexamined with respect to the role of the projector and its noises in the production of cinematic space. The goal of this chapter is look at how the new practices brought about by the transition to digital projection have allowed for a restructuring in the use of the film projector.[315] I aim to show how outside the structures of commercial cinema, since the genesis of video and digital video projection, the film projector was in fact already thought of as an *instrument* for the projected arts. My theory is that in this current period of transition during which D-Cinema is changing our cultural definition of "film," artists are returning to early cinema's mindset of experimentation with technology (predominant from 1895-1910, which culminated, as I have shown in Arnaldo Ginna and Bruno Corra's use of the projector-as-instrument discussed in chapter 2). I suggest that this return is not a nostalgic exercise, but stimulated on a (re)new(ed) conception of "film" based on the materiality and performative practices of the film medium as distinct from "digital." Within this exploration of "what is film," the filmmakers I discuss in this chapter focus on the immersive,

---

[315] When asked if he feared for the future of film, Karl Lemieux poetically suggests that this transitional moment was "like fall—[film is] slowing dying, but something beautiful will come about." Even if the corporate manufacturers stop producing filmstock, someone, somewhere will make emulsion and sell film (much like what happened with Polaroid instant still film). Karl Lemieux, telephone interview with author, September 24, 2012.

embodied, and lived experience of the audience in the cinematic apparatus and the *liveness* of production as opposed to the re-production of past, recorded moments.

Before examining these (re)new(ed) uses for the projector-as-noise-instrument, it is important to first examine the differences in the socio-technological experience of film projection and D-Cinema projection. This exploration provides the background for understanding the shifts in materiality and temporality between these two different modes of exhibition in order to better illustrate why there is a renewed interest in the projector-as-noise-instrument at this time of transition. After this comparison, I then turn to analyze the use of the film projector by McClure and Lemieux in relation to the potential new uses of the projector and the *performativity* that they offer. As digital projection becomes the normative means of cinematic exhibition, the role of the film projector can, and must, evolve as it adapts to the current socio-technological environment by seeking out new ways of exploiting its talents. As such, the projector's labour becomes a critical point of analysis at this period of transition.

4.2 Sounding Off: On Some Difference Between Film and Digital Projectors

As I have demonstrated, the immersive or embodied cinematic space is dependent on an interactive connectivity between the technology and the user as well as on the dialectical tension created by the critical distance of the audience member from the cinematic apparatus and their "emotional involvement in what is happening"[316] on the screen. In cinema, the audience is placed in a dialectical space of "being here" (in the lived space of the theatre) and "being there" (within the content of the screen space). Contemporary theatres are structured as such to maximize the *illusion* of cinema (best exemplified by the maxim suggesting that the audience member "*loses* his/herself in the *story*," i.e., the lived experience of the body is transcended by the imaginary content on the

---

[316] Grau, *Virtual Art: From Illusion to Immersion* (Cambridge, Massachusetts: The MIT Press, 2003), 13.

screen), and minimize "distractions" within moving-going experience. A number of structures

inform the way in which cinematic space is produced and managed: physical structures (the

positions of the chairs, the rows, the size of the screen); social structures (the rules and conventions

of social practice within the theatre, the imposed silence, the lack of interaction between the

audience and the screen or even between audience members); and political economic structures (the

hefty ticket prices, the location of the theatres and accessibility of the underclass). While regulating

our experience of cinema, these material, social and political economic structures also reduce our

ability to critically engage with the media as a technology. The introduction of D-Cinema changes

this insofar as the film projector, previously removed from the lived environment of the theatre and

sequestered into the projection booth, has now been expelled from the booth. Projection booths

have been stripped of the film projectors to make room for the massive D-Cinema projector, servers

and accoutrement (see figure 4.1). And, unlike the history of the film projector, the D-Cinema

projector never shared the same space as the audience; it has always been removed and/or hidden

from the lived space of reception (although its precursors—less powerful and less noisy digital

projectors—have been placed in the theatre space).

In the works of the artists I explore in this chapter, the grounds of cinema are contested.

The projector is brought out of the booth, into the audience's environment. Often, the artists do not

perform in traditional movie theatres, *playing* instead in art spaces (i.e., museums, artist-run centres,

galleries) or music venues (i.e., nightclubs, concert halls), where the projectors are in plain sight of

the audience. The liveness of the *performance* of the projector and the projector's body in the

immediate space of the experience takes precedence over the imagined sense of "being there"

produced inside the projected image (the dominant experience of exhibition that has followed from

film projection into digital projection). The artists explored in this chapter not only return the

projector to the lived space of reception, but also emphasize the *liveness* and *performativity* of the projector's labour through the use of its noises.

In chapters 2 and 3, I analyzed how artists have used the performative aspects of the projector's noises (the noises of its physical mechanical body and the noises produced through its voice) in order to illustrate how the projector helps to produce and define immersive or embodied cinematic space. For the sake of my overall argument about the *performativity* and *liveness* of cinema when considered through the projector, my examples were presented through an imagined idea of "projector noise" as unvarying, despite material differences in the mechanical construction, design and exercise of projectors. In actuality, not all projectors *sound* alike. To the refined ear, projector's noises can be distinct based on numerous mechanical variables including film gauge, mechanical construction, type of threading, light source, type of the shutter, enclosure, etc. For example, a 16mm slot load Elmo projector (see figure 4.2) is far less "noisy" than a 35mm Kineton projector (see figure 4.3) because the Kineton has a stronger light source (thereby requiring a more powerful fan to cool the machine), larger mechanisms (larger gears, larger sprocket wheels, a larger shutter, and a larger intermittent mechanism that all together produce louder noises than their smaller 16mm counterparts), and an open threading picture head (which means the noises of the mechanisms are not muffled by an enclosure as they are for the Elmo). The differences in acoustic noise between projectors are not limited to gauge. The noises of projectors of the same gauge also vary depending on their specific structures and the period in which they were made. For instance, the dominant noises of the original Cinématographe (1895) were generated by its clockwork gears and external shutter, which (when in use at approximately sixteen frames per second) sounded like a cross between a well-oiled coffee grinder and a toy propeller plane (see Appendix B, Track 1). Conversely, the Gaumont three-colour additive projector (circa 1910s) operated using a Maltese cross drive and had three-frame pull down (as opposed to the Cinématographe's single-frame pull down), producing

a much tinnier, albeit lower and louder noise, reminiscent of automatic gunfire (see Appendix B, Track 2). Barrel shutters—a rarity nowadays—sound differently than disk shutters used by the Cinématographe and the Gaumont (see Appendix B, Track 3 for a sound of a barrel shutter projector). However, what does not vary is that the *act of projection*, with any film projector, *produces* noise, and that this noise serves as a persistent reminder of the live action of the projector and the dialectical tension in temporality for the audience between the imagined screen space and the immersive/embodied space of the theatre.

While the film projectors are considered noisy, by contrast digital cinema projectors are imagined as silent (or at least as quieter than their filmic counterparts). However, this imagined quality contradicts any actual experience of these machines. While digital projectors also vary in their production of noise based on their physical construction and intended use, they all produce noises. Most of us will never be in the presence of a D-Cinema projector but we have been in the same environment as prosumer and/or consumer grade digital projectors (in classrooms, conference rooms, etc.). Even the smallest consumer grade digital projector makes noise. While the digital projector lacks the mechanical noises of moving gears, it requires a powerful fan to cool off its internal electronic systems (which, in the case of D-Cinema, includes the computerized projector *and* the computer server system). The "kaaaaaaaahhhh-chhhhhhiiii-kaaaaaaaahhhh-chhhhhhiiiii-kaaaaaaaahhhh-chhhhhhiiiii" of the film projector is replaced by the higher, whirling and more airy "hhhhaaahhhhhhhhhhhhhhhhhhhhhhhhhiiiiiiiiiiiiiiiiiiiiiissssssssssssssssssssssssssssssss" of the digital projector's fan—a sound that could be described as "white noise." More powerful projectors require more powerful computers and electronic components. In turn, more powerful computers/electronics require better exhaust systems and louder fans.

Even though the experience of the mechanical noises of the film projector may measure as "louder," the digital projector's noises are less grounded in our material experience of the world. It is

easier for us to find meaning in the mechanical noise of the film projector, in its mechanical articulation between the sounding and silence that compose the "noise" itself, than in the seemingly consistent and unvaried hiss of the digital projector.[317] The digital projector makes faster noises that are more fixed in tonality. As previously discussed in chapter 1, noises that appear too fast and too fixed (i.e., that lack a comprehensive *articulation*) take on a chaotic, confusing and deafening quality to our ears—as phenomena outside our apprehension of rhythm. The white noise is experienced as an acoustic phenomenon without an apprehendable rhythmic pattern and without inherent meaning. Perhaps, because the noises of the digital projector lie outside our comprehension, we imagine their deafening structure as *silence*, and/or, like we did earlier with the film projector by locking it away in the projection booth, we try to silence the digital projector entirely from our collective memory. The point is, while digital media does not sound "loud" to our imaginations, D-Cinema projectors are, in fact, very noisy. The Barco DP4K projector in Kodak's telecine department at Kodak Park in Rochester has seven different fans to cool off the massive server system that reads the digital information and the projection apparatus that exhibits the Digital Cinema Package (DCP)—six for the sever system and one for the projector itself (see Appendix B, Track 4). The fans run continuously when the machine is powered up, regardless of whether or not it is "playing" anything.[318]

---

[317] I recognize that the fan of the digital projector is, for all intents and purposes, a mechanical device, but because it spins at a much higher rate than the mechanical movements of the film projector, it produces a much higher and seemingly constant noise to the naked ear. The idea of the mechanical articulation being easier for us to "understand" comes from the work of Karin Bijterveld, who suggests that the faster the articulation of the mechanical noise the harder for us to ascertain meaning from it, which also conforms with the general idea of the structural perception of language as articulated (a set of presences and absences, words and spaces, that are equally important to the production and perception of meaning). A sentence is built through the use of words, but also the use of the spaces between those words.

[318] In order to maintain and "playback" the digital content, the projector must store and shuttle the digital files, but this labour does not produce a distinctive sound—the D-Cinema projector produces the same constant hiss regardless of its labour. This is in contrast to the film projector, which sounds differently when it is playing a filmstrip than when at rest, or when "running" without a filmstrip.

Herein lies the major disparity between the noises of film and digital projectors: how they differently express, acoustically and visually, their part in the production and performance of cinema. A major difference in the noises of the film and digital projector lies in their function as laborers, as represented through the noises produced in the act of projection. While there is a distinction between the noise of the film projector at rest (powered up but not running) and at work (when *playing* a filmstrip), the digital projector *always sounds the same* (unless turned off, or, to use colloquial term, "asleep"). This means that while the *performativity* of the film projector is marked by the production of specific and meaningful noises, the digital projector lacks this acoustic signifier—the *liveness* of the event, the *playing* of the digital motion picture, does not manifest a specific noise. This distinction in the noise production of the projector has real consequences for our experience of cinematic space as live and performative. The rhythm of the film projector is related to the audience through the production of acoustic and visual noises. The rhythm of the digital projector, by comparison, does not have an accompanying acoustic sign, although it does produce its own medium-specific visual noise. The lack of acoustic sign makes the experience of digital cinema *feel* removed from the material environment, thereby reducing the opportunity to engender the same kind of immersive or embodied cinematic space.

The rhythm of the film projector is related to the audience through the production of acoustic and visual noises. The rhythm of the digital projector is conveyed primarily through the image, through what might be called a "lack" of noise (i.e., the absence of the mechanical articulation, and absence of distinct noise production when playing). The lack of an acoustic sign in the performance of digital cinema contributes to our imagination of the medium as silent, non-invasive, and immaterial. In order to engage in an interactive way with the digital projector, the audience requires a tactile, material interface (such as a remote control, motion detector, or

interactive media wand).[319] The film projector's bodily noises, meanwhile, provide the audience with the critical distance needed to engage at once with the materiality of the medium, the politics of the apparatus, and the richness of the content.

While the digital projector may lack acoustic noise, it brings with it new phenomena of visual noise. D-Cinema and commercial grade projectors have more intensive standardization than consumer models (although this may change as consumers demand more stable images with higher resolutions).[320] Current consumer grade digital projectors produce a wide variety of visual noises— new issues of noise emerge distinct from those of the film projector, such as problems with resolution, colour space, dead pixels, fluctuations in aspect ratio, soft focus, contrast, etc. All of these new noises can happen *while* projecting a single (unchanged) content. These new noises produced by the digital projector shift certain visual noises from the art object to the technology. For instance, the colour resolution of a *film* is mainly determined by the condition of the print. The projected image changes very minimally because of the *film projector* (and even then, the issue is the light bulb's brightness and colour temperature which can temper the look of the projected image). However, with a digital video, the look of the projection is completely dependent on the colour calibration of the *projector*; the same data source can be read and projected concurrently by two

<hr>

[319] In virtual reality, the technological devices can be considered aids in the production of immersive space. One of the constraints of virtual reality, in function, is the inability to escape the cumbersome technological mediations of space (the head gear, the glasses, the remote controls, etc.). But these devices also allow for the critical distance for reflection necessary in the production of an immersive space. The subject is physically bound to the lived environment through these devices. The desire to minimize or overcome this physicality currently pursued is scary to me, because it will remove the materiality and embodied experience of the event—creating instead an illusionary space where the lived body is displaced in favour of an imaginary visual world.

[320] For an idea of how quickly the environment of digital projectors is changing, one must only look to Giovanna Fossati's recent book *From Grain to Pixel: The Archival Life of Film in Transition* published in 2009 in which she describes the current environment of commercial exhibition at the time of the book's publication. Beyond the operating, maintenance and upgrade costs of D-Cinema, Fossati suggests that "digital projection, as all novel technologies, is unstable and standards have not yet been chosen" (Fossati, *From Grain to Pixel: The Archival Life of Film in Transition* [Amsterdam: Amsterdam University Press, 2009], 56). Over the past year, the Society of Motion Picture and Television Engineers (SMPTE) has instated strict governances over D-Cinema technology, which ensure a standardized and stable projection regardless of brand, make or model of these high-end commercial units.

different devices and have dissimilar colour resolution). The same brand, the same make and model of projector can produce a unique image. T. Marie, an acclaimed American video artist working with the materiality of the digital video medium, has personally voiced her concern to me about this "unknown" aspect of presenting her work. This problem is ubiquitous and apparent to even the untrained eye of the average viewer. With the digital transition, the issue of visual noise control has shifted from an effect of the filmstrip and the lab, to the mechanisms of projection itself.

The visual noise produced by the film projector, aside from the synthetic images discussed in chapters 2 and 3, is primarily due to "damage" done to the filmstrip whereas, as just mentioned, the visual noise produced by the digital projector does not affect the art object itself. Filmstrips, as organically based material objects, have a life. Every time a filmstrip runs through a projector, it bears the mark of that experience. Regardless of how clean and well-maintained the projector, the act of being projected leaves a mark on the filmstrip. Regular play through projectors creates wear on the filmstrip: the emulsion and base of the filmstrip, coming into contact with the hard plastic and metal components of the projector at a rapid speed, become scratched. Theses scratches are either vertical and horizontal scratches, that, when projected, look like white, black or green lines running through the frame depending on the filmstock and if the scratch is on the base or emulsion side of the filmstrip. Dirt and dust in the air or in the projector can attach themselves to the filmstrip (creating little black specs when projected, where the light is blocked from hitting the screen). This noise is often conceived of in terms of damage and death. Paolo Cherchi Usai suggests that inherent in film is an auto-destructive quality: that it "dies while living" (i.e., that the act of projection, over time, "kills" the filmstrip, eventually irrefutably changing it from its original form and destroying its content).[321] But, following my argument, this "damage," this visual noise, adds depth to the experience of cinema. The scratches offer an alternative focal plane which points back to the

---

[321] Paolo Cherchi Usai, *The Death of Cinema* (London: the British Film Institute, 2001), 8-9.

materiality of the filmstrip and the hands-on labour of the projector. Like the acoustic noise of the

film projector's body, the rupture in viewing space created by the scratches engenders that critical

distance necessary for the audience to encounter the dialectical tension between "being here" and

"being there." The scratches, as the material evidence of labour and the cinematic disruption of

time, return the focus of the cinematic experience back to the film projector. As such, the film

scratch returns the focus back to the projector, to its material engagement and rhythmic properties.

Effects have been added to digital videos in an attempt to engender this same materiality—

to refer back to the labour of the film projector in the production of cinema. First, although by no

means a technological necessity, in trying to reproduce the "feeling" of film, D-Cinema specifically is

screened at twenty-four frames per second. But the mimesis of D-Cinema to film extends beyond

projection speed. Efforts are made to add "film noise" (i.e., the visual noise *produced* by the film

projector) to the digital image. To achieve a "filmy" look, scratches are added to the image content

of digital files, as are imaginary dust and dirt particles, and sometimes grain and light flares (the later

two derivative of filmstock and camera noises). I am particularly interested in the addition of

projector noises in order to provide "authenticity" to the content and or give the impression of age

to the footage. The unintentional visual noise of the film projector is purposely added to the digital

video content to emulate the filmic experience. The material traces of the liveness of the

performance (i.e., the scratches, dust and dirt) are added to the digital image content to give the

video a more filmic look but they do not properly exist in the digital realm. The occurrence of

scratches, dirt and dust on a filmstrip is random; each mark is unique in its position and

arrangement. The digital effect that attempts to simulate this visual noise lacks the ability to produce

these random compositions, and the digital "inscriptions" appear repetitive and artificial.[322]

---

[322] The first time I remember seeing film noise emulated digitally was in Eminem's music video "Sing
for the Moment " (2002), where extremely artificial-looking scratches and dusts have been added around an

Filmmakers and video artists have also imposed the acoustic noise of the projector into their original artwork. For example, to highlight the performative nature and the *liveness* of projection (and draw attention to this reframing of the picture through an elaborate arrangement of rear-projection mixed with live action within the screen space), Nicholas Ray added the mechanical noise of the projector into the specific locations in the recorded soundtrack of the *We Can't Go Home Again* (1976). Ray's film is a one of the first single channel film projections to incorporate sliding multiple frames within the screen (a technique similar to the multiframe, single channel film developed by Christopher Chapman in *A Place to Stand* (1967), but different insofar as Ray's multiple frames emphasized the *liveness* of the projection experience, Chapman, meanwhile, was interested in creating a mosaic effect, drawing together the rhythms of the different frames to create a larger whole, and invoking an aesthetic we now associate with video editing (similar to Harry Smith's use of multiple projection for *Mahagonny* (1980)). In the moments of *We Can't Go Home Again* where he uses the projector's noises, Ray also *films* the *projection* of the film. On top of illustrating the *liveness* of the projection itself, Ray's use of the projector, the projected image and the projector's noises within the screen space of his film created an additional tension by bringing the audience to the site of inscription, i.e., the temporal experience of the production of the film and of the act of projection. Ray only uses the projector's noise sporadically in the film, bringing the viewer in and out of this critical space of engagement.

Bruce Nauman also added the sound of the projector to many (if not all) of his works distributed on video but that were originally shot on 16mm film, including *Thighing (Blue)* (1967), *Walking in an Exaggerated Manner Around the Perimeter of a Square* (1967-1968), *Flesh to White to Black to Flesh* (1968), *Pinchneck* (1968), and *Art Make-Up* (1967-1968). The projector noises vary in loudness and in sound quality from video to video; it is likely that Nauman actively sought to have different

---

inner frame. I have noticed similar effects in television commercials, in television documentaries and programs, when attempting to engender a feeling of nostalgia.

projector noises recorded for each video transfer. Nauman never publically discussed his decision to

add the projector's noises to these videos, but these additions aptly reference the tension between

experience of film and video media. Mark Toscano, the lead preservationist for the Nauman videos,

hypothesizes another reason: simply put, Nauman missed the sound.[323] Something was missing in

the experience of these films-as-videos without the noise of the projector. No changes, however,

were made to the image field or the temporal rhythm of the video transfers. The projector's noises

were the only material addition to the transfers.

As D-Cinema becomes the normative form of exhibition, the question of how to project

avant-garde cinema that depends on this noisy materiality also becomes more prominent.[324] The

synthetic noise film discussed in chapter 3 cannot be reproduced through digital media. The finished

products can be *transferred* to video, but the digital projector, which reads content in data files, does

---

[323] When preserving the original 16mm filmstrips, Nauman's decision to distribute the material with a different soundtrack caused archivists pause. Should they re-record the original soundtrack with the addition of the projector, and make prints of the films (to be played on projectors) with recorded projector noises as soundtracks? Should the video (which was how the content was distributed, and therefore seen) or the original film (which was the original product, but was not distributed) be considered the "object" or "objective" for the restoration? The issues regarding the authenticity and authority of the object (i.e., the preservation of source (or pre-print) versus access (or distribution) material, if there are significant differences in their content) will only intensify as film exhibition falls to the wayside in favour of D-Cinema.

[324] This question is also applicable to the way in which avant-garde materialist *film* is preserved. The question is not inherent to the digital transition specifically, but to the larger question of reproducibility. For instance, in Paul Sharits's *S:TREAM:S:SECTION:S:S:ECTIONED* (1968-70) the shot imagery of waterways are disrupted by deep, intentional scratches in the emulsion surface. The materiality of these scratches is important to the experience of the film—a print of the film, in which the scratches are flattened to the same photographic plane as the representational imagery, does not accurately capture the intention of the artist. To abstract the film further away from its original form by projecting it as a digital transfer would be detrimental to the experience of the work (to say the least). That said, whenever that original filmstrip is screened, the process of being projected materially changes it. This tension between access and preservation is a constant struggle that will only be proliferated by the digital turn. Michael Snow perhaps best explained the gist of my argument regarding the true experience of film. On a panel at the Experimental Media Congress of 2010 in Toronto, Ontario, Pip Chodorov pointed out that in excess of 70,000 people had viewed Snow's seminal film *Wavelength* (1967) on youtube.com. Snow simply responded "And they still haven't seen the film." The difference between the experience of the film on film to that of a digital transfer posted on the internet was so great as to merit the assertion that they were not, in fact, the same work. Snow's release of the video *WVLNT (or Wavelength For Those Who Don't Have the Time)* in 2003 plays to this same difference in the experiential nature of film and video. However, at a screening of a new 16mm colour print of *Wavelengths* at TIFF Cinematheque later that same year, Snow expressed nothing but satisfaction with the contemporary photochemical reproduction of his original work.

not translate the source material in the same way, and cannot *create* the synthetic sounds or images

(the synthesis *happens* before the transfer into digital data, as the digital data records the act without

moderation). For animated sound artists, like myself, who are interested in the materiality of

translation of a visual symbol into an acoustic representation, D-Cinema is not an adequate means of

exhibition, for the act or the performance of projector becomes a representation of a past *transfer*.

The instrumentality of the machine and the *liveness* of the cinematic event are lost in translation.

Similarly, flicker film cannot be recreated with the same optical effect as the original through digital

media. Will these forms of avant-garde cinema, dependent on the projector's noises, become lost

treasures that cannot be accessed because they have become products of anachronistic technology?

Or will the importance of the film projector in the productive creations of these works or more

broadly in the production of cinematic space lead to the preservation of the machines alongside the

films? One can only hope, because without the film projectors, the original or intended experience

of the films cannot be recreated.

4.3 A History of the Projector and the Projected Arts

Perhaps because of the digital transition, or in anticipation of it, the history of the projected

arts has begun to be distinguished and compiled. In the mid-1960s, artists began to explore the use

of the film projector outside of the theatre space. This timeframe corresponds loosely with the

development and access to analog video among avant-garde artists, and to the temporal and

implications of video on the aesthetic of moving image art.[325] While film and the filmstrip have been

---

[325] Chrissie Iles's research supports this claim in one of the only books on the projected arts, *Into the Light: The Projected Image in American Art 1964-1977*, but the specific correlation is plainly stated by Maxwell L. Anderson, The Director of the Whitney Museum of American Art at the time of the book's publication. He states: "For this generation of artists, growing up in the 1950s, both these models [which he terms the phenomenology of space and the phenomenology of consciousness] rejected the traditional space of cinema, which had contained their early experiences of popular film. The emergence of the video camera as a tool for artistic experimentation in the late 1960s, alongside the rise of television, coincided with the artists' assertion

considered an art form, the *act of projection* has not. Once it was drawn outside of the projection space

and typically put in plain sight of the audience, the projector was again given agency as an

instrument in the production of space. Filmmakers of the mid-to-late 1960s used the projector and

the act of projection to push the boundaries of what had come to make up the language of cinema.

These films called attention to the *performativity* of the projection (and often included a performative

element), but also to exhibition space, to the problematic of representation, and to the formal

expressive constraints of the cinematic apparatus. For example, in Barbara Rubin's *Christmas on Earth*

(1963), a dual projection with improvised colour added with filters during the projection, and the

projection differs from screening to screening. Rubin's film is one of the first films to be considered

a performance film. Robert Whitman's *Shower* (1964), in which an image of a woman showering is

projected on a shower curtain in a facsimile of a concrete shower (shown within a gallery), plays with

the tension between the performance of the projector in real-time, the imagined potential for

psychodrama in the projected content and representation of a past event.[326] *Prune Flat* (1965),

Whitman's next performative film, combined live theatre and the projected image, insofar as the

actors on the stage interacted with the projected images, and the projected images often coloured in

the space of the stage and played with the tension of the presentation and representation by

engaging in a dance with the actors' bodies—a dance in which the actors' bodies were outlined and

only visible *through* the representation. In Carolee Schneemann's *Plumb Line* (1971), the artist films

her own relationship with a projected image; the final film is a recording of that performance that

culminates in illustrating a "seam" in the screen. This history of film-as-projected art extends back to

Ginna and Corra's experimentation with visual music, but did not gain momentum until video

of the film loop as a device by which the traditional space of cinema could be overturned" (Maxwell L. Anderson, "Foreword," *Into the Light: The Projected Image in American Art 1964-1977*, ed. Chrissie Iles (New York: Whitney Museum of American Art, 2001), 27. While Anderson's claims privilege the filmstrip and the mechanisms of inscription, the basic gist of his statement has merit.

[326] The fact that the film was made no more than four years after Alfred Hitchcock's *Psycho* also informs the *experience* of the piece.

liberated our view of the film projector. Performance film, or film as a projected art, often forces the audience to look at the materiality of cinematic space and their immersive position within it. Perhaps the most successful of performance films at establishing the immersive quality of cinematic space is Anthony McCall's seminal work *Line Describing a Cone* (1973) where, with the help of smoke, the exhibition space is transformed into a three dimensional environment, highlighting the space between the projector and the screen. In *Line Describing a Cone,* the filmstrip is composed of a slow creation of a circle: the filmstrip begins with a clear "dot" on a black background that slowly grows into a clear curved line of light, finally becoming the clear outline of a circle. In the smoke-filled projection space, this dot becomes a piercing line of light physically connecting the projector to the screen; the curved line becomes a shelf that divides the space; and the circle takes on the form of a three-dimensional light cone that fills the room. Within this material representation of the dialectical space between the projector and the screen, the audience is invited to disrupt and/or play within the projection. As Chrissie Iles poetically describes:

> In *Line Describing a Cone* McCall shifts Barthes' imperious film beam, situated above our heads, into a democratic participatory field that almost touches the ground. We are invited to walk through its hollow cone, to lie under it, look into it, stand inside it, move our hands over top of it, and drift through it, disappearing into its volume like mist, only to reappear on the other side, like Alice in Alice Through the Looking Glass…"[327]

Within this performative space produced by the cultivation of an active relationship between the projector, the projected image and the audience, the definition of cinematic space is redefined based on *immersion*—to a way of thinking about and experiencing film before the dominance of narrative cinema and the production of cinematic space as illusory. Many of the films produced as projected arts refer back to pre-cinema experiments in perception discussed in chapter 1, including re-examining the early technology of projection. It is almost as if, in the light of video, artists were able

---

[327] Iles, 45

238

to reengage with the roots of cinema, to reach back and bring forward practices forgotten in the staging of the commercial movie theatre.

However, while many of the examples of film as a projected art showcase the projector, they do not necessarily incorporate the *projector's noises*. Interestingly, the attention to the projector's noise, as a musical instrument, has gained momentum around the same time as digital projection practices become increasingly normative. One of the main differences in the use of the projector's noise examined in chapter 3 and the examples in this chapter is the place of the projector's body in the act of production. While in chapter 3, I discussed the use of the projector's noises in the production of synthetic sound film and flicker film, both genres of avant-garde cinema allowed the projector-as-object to remain concealed. In this next section, I will be looking at the work of two contemporary artists who have brought the projector-as-noise-instrument to centre stage, bringing the instrument out of the booth and into the band.

4.4 Projector Performances in the Twenty-First Century: Bruce McClure

Bruce McClure is possibly the most outspoken and celebrated artist in the field of projector performance, and one of the most pertinent examples of contemporary artists working with the projector-as-noise-instrument. He is also one of only a handful of people working with not only the materiality of the filmstrip but also the mechanics of the projector. McClure has travelled the world, opening for the iconic noise band Throbbing Gristle and performing at the highest institutes of modern art (including the Whitney Biennial, the Walker Art Center, and the Wexner Center for the Arts) as well as the most exclusive avant-garde film festivals (including Rotterdam International Film Festival, the Toronto International Film Festival's "Wavelengths", the New York Film Festival's "Views of the Avant-Garde"). His performances are abrasive, noisy, layered and compelling, flanked by warnings of epileptic seizure and hearing loss. But it is McClure's interest in the projector-as-

noise-instrument (i.e. the projector, not the filmstrip, as a technology for productive creation used in order to produce both visual and acoustic noises) that really sets him apart.

McClure comes to film through architecture, and his ability to imagine two-dimensional fields as three-dimensional spaces is likely inspired by that background. In describing his early relationship to the film medium, he states:

> I went to school when people drew on tracing paper, or something they call vellum… It was a transparent medium, one that could be flipped from right to left or top to bottom. Just as film can be. It's a two-dimensional representation of three-dimensional objects. Just as film is two-dimensional and somehow becomes three-dimensional. Say, if you add a time component to it, or start to project it into a room. It can take on a three-dimensional quality because of its existence on the film plane and then on the plane of the screen.[328]

The optics of cinema was an obvious muse for his early film works, which returned to and expanded on pre-cinema technologies—specifically the phenakistoscope. In the 1990s, McClure was constructing massive "Roto-Optic" devices that consisted of "discs painted with colored patterns and mounted on square floor fans that rotated at about 1,200 rpm; viewed under stroboscopic light, they created apparent three-dimensional images."[329] His inspiration for these devices came from an interest in the optical relations between stroboscopy and the illusion of movement. But, unlike the original Victorian devices, McClure was never interested in producing representational moving images. Instead, he was captivated by the potential of this pre-cinema method of projection to create embodied, optical spaces, where movement and illusion collided and fell apart. With his Roto-Optics instrument, McClure aimed to re-present the moment where movement of the spinning disk and the flashing of the strobe light came together to produce the illusion of stillness (reversals of the first experiments in the illusion of continuous motion preformed by Roget, Plateau and Faraway in

---

[328] Bruce McClure quoted in Brian Frye, "In Conversation: Bruce McClure with Brian Frye," *The Brooklyn Rail: Critical Perspectives on Arts, Politics and Culture* (July-August 2006), http://www.brooklynrail.org/2006/07/film/bruce-mcclure-with-brian-frye (accessed October 9, 2012)

[329] Ed Halter, "Powers of Projection," *Artforum* (January 2010): 183.

the mid-nineteenth century,[330] but also of the interest in movement and the experience of speed revered by the Futurists and discussed in chapter 2).

What distinguishes McClure's performances are his active modification of the *projector* (not just the filmstrip or exhibition space), his relationship with the technology, and his ability to draw attention to the audience's relationship to the projector. McClure truly turned the film projector into a noise instrument reminiscent of Russolo's *intonarumori* (discussed in chapter 2). While most of the productive creation of acoustic noise in McClure's setup occurs outside of the projector (with the "interference" of the effect pedals (akin to guitar pedals) that modulate the source sound before it reaches the ears of the audience), it is this modification of the projector that primarily creates the visual noise. Each projector is modified in a slightly different way, but looks identical from the outside, like Russolo's *intonarumori*. The internal components of each projector are modified in order to produce a specific visual noise, which are further modulated in "real-time" by McClure's "playing" of the projectors/instruments, primarily through the variable transformers, but also through tweaking the focus and depth of field of the projected image. When he began thinking about modifying the components of the projector, McClure literally brought the focus of cinema back to the projector, away from the filmstrip and the screen content, by focusing the lens on the inside edge of the projector's gate—the hole that allows a "frame" of light to pass through it from the projector's lamp house through the filmstrip to the screen—instead of on the frame of the filmstrip as done for the traditional projection of a filmstrip. This simple step reinforces the role of the projector, while literally blurring the image content represented on the filmstrip. But McClure takes this indexicality of the projector a step further, highlighting the mechanical labour of the projector to his audience by focusing on the movement *created* by the machine, by removing the pressure plate from the projector (the mechanism that holds the filmstrip in place as it passes by the

---

[330] For further information on these early optical experiments, please refer to Henry Hopwood, *Living Pictures: Their History, Photo-Production and Practical Working* (1899; repr. New York: Arno Press, 1970), 9.

gate). In the case of his *The Southern Star Passes Without Pressure (*1998), McClure's removal of the

pressure plate serves to further distort the image because, while the intermittent mechanism and

claw/pull down function of the picture head still functioned normally, the filmstrip wiggled and

waved as it passed by the gate. The filmstrip is not held still. For many of his performances, in the

space where the pressure plate attaches to the projector's body, McClure inserts a custom made

metal plate with "a hole punched through it…[that] makes a surprise on the screen, setting off light

as an object in the room."[331] This modification serves to illustrate the fragmented, or in his words

"truncated," nature of viewing in cinematic space. McClure's next modification further emphasizes

the "holes" in the projector (the gate as well as his custom punctured metal plates) as directors of

light. McClure creates small, metal mesh screens, and places them in different angles inside the holes

of the projector, in order to further obstruct and distort the projector's production of beams of

light. McClure's final modulation of the projector is made through using different lenses, with

different focal points, to create overlapping projected image (or frames) of different sizes. For

instance, in *Cong In Our Gregational Pom-Poms* (2009), McClure uses two different lenses, one 70mm

and one 12.5mm, which project different frame sizes and are used to effectively place one frame

inside the other.[332] All of these modification help to create projectors that act as different noise

instruments in McClure's orchestration of visual and acoustic noise.

---

[331] Bruce McClure quoted in Brian Frye, "In Conversation: Bruce McClure with Brian Frye," *The Brooklyn Rail: Critical Perspectives on Arts, Politics and Culture* (July-August 2006), http://www.brooklynrail.org/2006/07/film/bruce-mcclure-with-brian-frye (accessed October 9, 2012). McClure often refers to the pressure plate as a "film shoe," which may confuse some readings of his technological setup. But his use of the term "film shoe" is analogous to the pressure plate. Proof of this comes later in the Frye interview when McClure states: "A big breakthrough for me was noticing that if you take the pressure plate or the film shoe—or whatever you want to call it, that thing that keeps the pressure on the film so that the individual sprocket holes are grabbed by the claw in the film, so the frames are advanced successively—I found it very liberating to take that thing out and just watch the film go through the projector unimpeded" (McClure quoted in Frye, "In Conversation: Bruce McClure with Brian Frye," http://www.brooklynrail.org/2006/07/film/bruce-mcclure-with-brian-frye (accessed October 9, 2012).
[332] Ed Halter, 183.

McClure is best known for his multiple projector performances, typically consisting of two,

three, or four of these modified 16mm slot load projectors, variable transformers (which operate like

dimmer switches to control the projector's lamp house), and an array of guitar effects pedals (to

manipulate the optical soundtrack). McClure acts as the composer, performer and conductor, the

sole agent responsible for the production of light and sound. Instead of reels of film (or pre-

constructed and completed linear compositions),[333] McClure employs short loops of film (each with

different, usually minimal, content). Each projector projects a different loop. During a performance,

McClure modulates the light brightness of the individual projectors, to build and dissolve the image

composition.[334] Using the effects pedals, he modulates his source sound obtained from the filmstrip

though the projector's optical sound reader. Using this collection of audiovisual electronics, McClure

believes to be fulfilling what John Cage described in "The Future of Music: Credo." Before Cage

describes the potential of the projector for the production of synthetic sound (as I discussed in

chapter 3), he *imagines* multiple projector performances:

> With a film phonograph [optical soundtrack/reader] it is now possible to control the
> amplitude and frequency of any one of the sounds [natural and mechanical noises
> traditionally outside of the definition of music] and to give to it rhythms within or

---

[333] In 2004, Stefan Tcherepnin and I created a short performative film based on Johann Sebastian Bach's *Goldberg Variations* "Variation 11." We translated the entire score into two separate filmstrips, one for the treble and one for the bass. Instead of creating a system of translation for specific notes and/or chords, we opted to articulate the entire score using only black and clear leader. In doing so, we *rhythmically* translated the score (our reasoning for this was somewhat practical as, if we tried to use colour to translate notes, the optical reader would not have produced a strong enough differentiated signal, and we wanted to ensure the transitions between the notes were clearly differentiated). We connected the audio outputs of the two slot load Elmo 16mm projectors we were using to Tcherepnin's Serge Analog Synthesizer. As the filmstrip played, we manipulated the base noise of the filmstrip (as our sound source) through the synthesizer. The image, composed of the two projected frames meeting in the corner of the room, produced a basic rhythmic flicker film, with the added visual rhythm of the two complementary melodies of the original score. Unhappy with the detouring from the specific material form of the soundtrack (i.e., creating something more "musical" through the synthesizer than the material itself denoted) and wishing to return to the base rhythm of the composition, I embedded photocells in the screen and connected the raw signal to a set of speakers, so that the projected image could "talk back" to the projector.

[334] In all of the performances I have seen, McClure centers the throw of each projector, but uses a variety of aspect ratios. He also controls which projectors are lit and when, in order to produce a variety of potential visual images within the limits available to him (i.e., by varying the permutations and combinations possible with the four loops).

beyond the reach of imagination. Given four film phonographs, we can compose
and perform a quartet for explosive motor, wind, heartbeat, and landslide.[335]

For Cage, the film projector, with its internal optical sound reader, was already an electronic musical

instrument. And McClure was (likely) the first to orchestrate a "projector band" Cage describes,

which concentrates on the *acoustic* production of the technology while also incorporating visual

elements of the medium.

McClure's insistence on immediacy (of the productive creation of the experience) and

improvisation (within his set of technological variables) are also influenced by Cage's ideas and

writings.[336] For Cage,

The Composer (organizer of sound) will be faced not only with the entire field of
sound but also with the entire field of time. The "frame" or fraction of a second,
following established film technique, will probably be the basic unit in the
measurement of time. No rhythm will be beyond the composer's reach.[337]

While Cage's definition of time translates well into the structure of the filmstrip for synthetic sound

production, Cage's use of "time" in his own work more closely resembled Bergson's idea of duration

than the linear and unrelenting progression common to most narrative film structures. Cage

measured time in terms of "lengths" or "time-brackets" wherein there was a period within which the

musical sound must be played, but not specific direction for how long (within that time frame) or at

what speed the sound should be played. Cage's structural concept easily translated into sections of

filmstrip, where "time" and "timing" can be materially measured and articulated, insofar as the

projector offers a basic stride (of twenty-four frames per second) from which this timing can be

measured. However, unlike Kubelka (and the example of *Arnulf Rainer* analyzed in chapter 3),

McClure used this base rhythm and the slight irregularity in the motors of different projectors to

---

[335] John Cage, "The Future of Music: Credo (1937)," *Silence: Lectures and Writings* (1961; repr. Middletown, Connecticut: Wesleyan University Press, 1973), 3.

[336] According to Ed Halter, in the late 1970s, when McClure started making films, McClure and Cage met regularly to play chess. Cage became one of McClure's primary influences. Halter, 183.

[337] John Cage, The Future of Music: Credo," 5.

generate rhythmic differences in his projector performances. For example, in the two-projector composition *Cong In Our Gregational Pom-Poms* (2009), one projector is outfitted with a film loop (approximately six to eight feet long) with a strict structure of three-frames black (opaque) leader proceeded by one frame of clear leader or slug (remnants of film prints discarded by the film lab); the other projector with a one-to-one flicker of black and clear leader. Because of the different rhythm pattern of the filmstrips, and because no two projectors' internal gears are perfectly synchronized, "the recurring frames of light go in and out of sync in a hypnotic arrhythmic strobe, with still images of scratches and bits of dust lingering for milliseconds in the mind after they hit."[338] Though the loops are prepared in advance, McClure's compositions "happen" in real-time through the *performance* of the film loops. No two performances are exactly alike insofar as the filmstrip may start and stop in different places, the projector's motor may be running at slightly different speeds, but also because of the way in which McClure *plays* his instruments. The sonic compositions, according to his own account, are entirely improvised. The visual compositions depend on the liveness of the projection and on McClure's decisions about mixing images. Further, the variable transformers can modulate what images are projected, when, in what combination and for how long (McClure can shut off power to a specific light bulb or projector, thus affecting the projected visual composition). The compositions are created *live* in the space of the performance.

But the liveness and performativity of the presentation are not the only factors in engendering immersive space during a McClure show. McClure finds that the presence of the projectors in the same space as the audience is a crucial component for his performances because it allows the audience direct access to the technological materials of production. Conversely, by placing the projectors in the same environment as the audience, the artist, who is physically bound to the projector (*because* of his use of the projector-as-instrument, i.e., he needs to be near the instrument

---

338 Halter, 183.

because he has to *play* it) has direct access to the audience, to their reactions to the content and to

the mutually constitute cinematic space of the theatre. In his eyes, his presence in the theatre or

performance space has an embodying effect akin to the artificial smoke that illuminated the three-

dimensionality of the light beam in the performance of McCall's *Line Describing a Cone.* McClure's

presence in the audience's environment calls attention back to the cinematic apparatus. As McClure

states on the topic of his place in the audience's environment:

> I usually call attention to myself as being someone in the room. I'm always grateful
> to have the opportunity to enact something in a room. One of the things I'm
> interested in is being in a room with people who are seeing the work and
> participating in the ushering in of light, in one way or other. Consequently, I do
> various kinds of performances. I usually have things to say that don't necessarily
> have anything to do with the film. I'm creating a haze, you could say, to replace that
> cigarette haze that was once a part of theatres. I like to create a haze of spoken or
> written words. I tend to enjoy writing something that might be called a "film
> treatment," in preparation for a screening and distributing that in addition to saying a
> few words that have something to do with an immediate experience prior to the
> screening. It's an attempt to cloud in order to get more than one picture. I was
> thinking of how in a smoky room you benefit from the beam of light on a wall or a
> screen. And in order to see the beam of light you might throw dust in the air.[339]

In this statement, McClure clearly asserts his emphasis on generating, through various means, an

embodied cinematic space. Through reflecting on his material practice, McClure recognizes that the

dialectical tension necessary for an immersive experience is achieved not only through sensory or

embodied experience, but also through providing intellectual fodder to nurture critical reflection.

Unfortunately, the interaction McClure fosters with his audience sometimes falls flat; and, because

he is such an important part of the performance, instead of inspiring critical engagement, if the

audience disengages with him on a personal level, their emotional response also affects their

participation (or enjoyment) within the immersive or embodied space produced through the

projector's noises.[340]

---

[339] Bruce McClure quoted in Brian Frye, "In Conversation: Bruce McClure with Brian Frye."
[340] In a performance at the Harbourfront Centre in Toronto, for the Images Festival in 2007, McClure appeared onstage only to mumble somewhat incoherently about smoking, about how he wished

McClure's innovative use of the projector-as-noise-instrument can, in many ways, be seen as a return to the performative aspect of cinema explored by Ginna and Corra. Even more so, the popularity of his projector performances is educating new audiences in this new way of experiencing cinema through the projector. The timing of this innovation at the crossroads of digital exhibition technology suggests that possibly the film projector will gain a new life as a noise instrument for productive creation, as their commercial usefulness diminishes. McClure's emphasis on *noise* is key, for many pioneers in projector performances (for instance, the highly underrated Pierre Hébert) have turned to combining digital and analog projections in their performance set-ups. However, a new generation of noise artists is emerging. This interest in embracing the material noises of the projector is also what guides Karl Lemieux's approach to film.

4.5 Projector Performances in the Twenty-First Century: Karl Lemieux

Karl Lemieux, a Montreal-based filmmaker (who trained under Hébert), is leaving his mark in the short histories of film-as-a-projected-art and the projector-as-noise-instrument. Lemieux has performed internationally as a member of Godspeed You! Black Emperor, and on his own at various international film festivals and art spaces, including Toronto International Film Festival, EXiS: Experimental Film and Video Festivalin Seoul, Images Festival in Toronto, and WORM in Rotterdam.[341] Lemieux began his career making traditional single-channel avant-garde films while

---

people could still smoke in theatres. Without contextualizing what he was saying, he gave off the impression as an arrogant burn out (pun intended) who was not invested in the performance and did not care about the audience. This set the mood for his performance, and although many enjoyed the onslaught of noises he produced live in that theatre space, and a consciousness of the awkwardness and disembodiment of the contemporary theatre was related through the performance, it lacked that sense of immersion (the audience, critical of the environment, was distanced from his or her bodily engagement, kept at arms length of the experience thorough this feeling of negativity). Negativity is not noise.

[341] Lemieux is still best known for his collaborations with avant-garde musicians, including Godspeed You! Black Emperor, Jerusalem In My Heart and DJ Nilsen, amongst others. Recently, Lemieux has moved from the clubs to stadiums by doing the visual projection for the Black Keys. The Black Key performances were done using the digital light boxes embedded into stadium walls. Lemieux's original film content was

attending Concordia University. He still makes "films" in addition to his projector performance

practice. His work concentrates on visual noise, with specific interest in the material visual noises

produced through the act of projection (like scratches, burned frames, etc.). Lemieux's definition of

noise is closely related to his experience of abstract art. As he explains:

> When I was in CEGEP, and we went on a class trip to the Musée des Beaux-Arts in
> Montreal, where we saw all this abstract painting. It was the first time I had seen
> abstract painting (laughs), and everyone was talking about shape and colour, but all I
> saw was noise. It was wonderful![342]

This reaction offers a poetic turnabout from Ginna and Corra's first response to the projector's

visual noise as a means for producing *abstract* images. Lemieux's connection to noise is long lived.

Growing up across the street of a Styrofoam factory outside of Victoriaville, Québec, the industrial

noise was so loud that his family often could not open the windows of their house. Lemieux's

relationship to noise falls in direct opposition to Adorno and Eisler's hypothesis about the

discomfort of industrial noise, perhaps because with the shift to an information-based society (as

opposed to an industrial-based society), there is comfort in the soundscapes of the past. If Lemieux

represents a standard subject for a case study, it would seem that his acoustic memory has been

affected by the noisiness of the factory in a positive way:

> Growing up, it was very noisy…I don't know if it was that drone [of the factory], I
> became fascinated by noise. It makes me relaxed. It feels safe. I like it. And I like the
> raw energy. It's like punk rock: full of raw energy and intensity.[343]

However, Lemieux's feelings towards noise, specifically in regard to his relationship to the

projector's noises, are in stark contrast to the fear and subservience described by Adorno and Eisler

regarding the sound of the film projector. But his projector-as-noise-instrument also does not

---

digitized, and broadcast, rather than projected, in these light boxes. The live, performative element was
displaced since Lemieux himself had no hand in the broadcast. As Lemieux states: "It was so different. The
engineer, she pushed a button, and that was it. I prefer the projectors" (Karl Lemieux, telephone interview
with author, September 24, 2012).

[342] Karl Lemieux, telephone interview with author, September 24, 2012.

[343] Ibid.

produce the muted apparitions discussed in chapter 1. The projector's noises are not something to be appeased; rather they are the raw material from which Lemieux forges his compositions. They become part of the material form.

Like Ginna and Cora, through his use of the projector-as-noise-instrument, Lemieux focuses his attention on the production of visual noise But Lemieux is specifically interested in abstracting representational images (shot photographic film) *through* the act of projection. Using the projector as his instrument, Lemieux purposely scratches, burns, bleaches and displaces the shot images *while* the filmstrip is being projected. The immediacy of the event (i.e., this live production of visual noise) interests Lemieux insofar as it allows for musical and improvisational aspects of performance. The techniques Lemieux uses to abstract the representational image are distinct to each performance (i.e., irreproducible). Using approximately ten-foot loops, Lemieux mediates the image by pulling on the filmstrip, forcing a single frame to stay in the position of the projector's gate. When held in the gate, the heat from the lamp house warms the emulsion of the frame. If held long enough, the emulsion will start to bubble, eventually melting the acetate or polyester base of the filmstrip from the centre out. While this heat and melting of the filmstrip *distorts* and/or *destroys* the image, on the other, the act of burning *adds* colour and texture to the picture. For example, the source material for Lemieux's film *Western Sunburn* (a documentation of a performance) is black and white; however, by burning the filmstrip, Lemieux colours the images with burnt browns, ambers and oranges (simulating colours of the sky right before the sun sets). These "burns" produce the look of a beautiful, organic and almost liquefied image when projected (see figure 4.4). Because Lemieux is producing the burns live during his performance, the audience is brought into the space of this slow destruction (or transformation) of the stilled motion picture.

The tension between the stilled frame and the motion of the filmstrip is one of Lemieux's primary interests, perhaps best illustrated through a second technique of slicing the filmstrip as it

runs through the projector. While the burned images are localized within a frame and the visual effect is immediately perceptible to the audience, the cuts (made by scoring the filmstrip with an X-Acto knife) take time before their "noisy" contribution is perceived. The filmstrip, in motion, can only bear so much damage. The force of the projector, the pull of its internal gears eventually splits Lemieux's cuts (vertically positioned in the frame, parallel to the length of the filmstrip) into two distinct ribbons of film. These two halves are eventually pulled out of sync by the projector, creating a split screen effect. Sometimes the ribbons turn and flip, adding further distortion and displacement of the representational picture and/or intended projected image. Both the burning and scoring of the filmstrip engender a sense of the materiality of cinema to his audience, and add a sense of liveness and performativity to the act of projection.

Lemieux's contemplative relationship with the frame and the filmstrip is extended to his view of the projected frame, or screen space, of cinema. With Godspeed You! Black Emperor, using four projectors, Lemieux produced two, side-by-side, projected images. This is the only time he performs using double projection. Left to his own devices, Lemieux prefers the structure of the traditional projected screen—that single rectangle of light. While still using four projectors, Lemieux layers his images to produce a density and complexity to his performance. Much like scoring the filmstrip causes a rupture to the experience of the film, Lemieux uses the dominance of the traditional screen space to draw attention to potential embodied experiences of cinema. Instead of challenging the dominance of the screen by shifting the focal dimension from the filmstrip to the projector (McClure's technique), Lemieux suggestively explodes the light rectangle that has come to represent screen space in the language of cinema. The technique is simple: Lemieux holds a glass or a bowl in front of the lens of the projector, thereby deflecting the beam of light. The effect is powerful: the frame extends, as thick, crystalline shapes of light, across the ceiling, onto the floor, into the audience, reaching out of the frame and into the embodied space of the theatre. At a film

performance festival in San Francisco, Lemieux was the only performer to step outside the *shape* of traditional screen space. "I filled the room," he explains, "while others, they only had that small rectangle."[344]

Unlike McClure, Lemieux does not modify his projectors beyond two practical functions: first, the distance between the projectors and the screen may demand the switching of lenses (but he uses the same lens for each projector), and second, he cuts an automatic shut-off from a single wire (to allow for the pulling and manual stopping of his film loops). He typically uses four identical projectors for each performance (but he has used as few as two and as many as ten to produce his visual compositions, with the ten used only once to produce what he describes as an "immersive space"). He began using Singer auto load projectors because they were cheap, easily replaceable, and could sustain the physical trials he demanded in his performances (i.e., Singers had the flexibility to withstand the force of pulling on the loop in order to burn specific frames much better than other models). Since then, Lemieux has shifted to Eiki slot load projectors, the same models used by McClure.[345] Instead, Lemieux focuses his attention *on the way he plays the filmstrip through the projector* and on addition of external optical tools (such as glasses and bowls) in front of the lens, to further distort and mediate the image. He also physically *moves* his projectors during performances (a feat that anyone who has carried a 16mm projector knows is not easy, especially not while the machine is running). Lemieux explicitly views his projectors as *instruments*, and compares his use of his instruments to the reappropriation of the record player with the rise of turntablism (as an example of a technology of reproduction that was given new life through creative ingenuity):

> You can do anything with these new instruments. Instruments that you make.
> Prepared instruments, like guitars or pianos, what can you do with them? You can

---

[344] Karl Lemieux, transcribed from telephone interview, September 24, 2012.

[345] In conversation, when I point out this similarity, Lemieux remarks, "Well, what can I say, they're sexy projectors. They're bright. They're sturdy. They're good" (Karl Lemieux, telephone interview with author, September 24, 2012).

move them, put them on a table or something, but how can you make them new?
The projector is very exciting. You can do anything with it. It's all new.[346]

This enthusiasm for the projector-as-noise-instrument is reminiscent of Moholy-Nagy's theoretical

study of the gramophone and the projector (examined in chapter 3) as technologies for the

production of new synthetic phenomena. But Lemieux takes the idea of the projector-as-noise-

instrument as step further by transforming the typically isolated labour of the projector into a

collaborative musical environment. Lemieux plays his projectors with a band.

While still interested in immersion and immediacy in the *cinematic* event, Lemieux is also

interested in the idea of an audiovisual art more in line with *musical* practices. Lemieux moves away

from the idea of the projector as an authoritative, isolated and individual "voice" towards the idea of

the projector as an audiovisual component of a larger band (consisting of other, separate

instruments and producing other, separate noises). This collaborative mindset is apparent through

the process of which he and his partners create and interact. His relationship with David Bryant, for

example, with whom Lemieux has worked on numerous projects, reflects this collaborative spirit.

The process of collaboration, whether under the headline of "Karl Lemieux" or "David Bryant"

remains the same: Lemieux and his projectors' visuals relate to the musical elements of the

performance as if each were equally important to the whole, and each an extension of each other.

Lemieux speaks of his relationship to his collaborators, specifically in reference to improvised

performances, as if he were another musician in the band:

You have to listen to what each other is doing. It's like a conversation. You can't all
be talking or its just shit. Listening is a very important part of my practice.[347]

The visuals produced by his projectors are the voices he contributes to the mix. Perhaps because

Lemieux collaborates with musicians, his performances are less about the creative potential of the

projector's *acoustic* noises (although recently with Godspeed You! Black Emperor, the projectors

---

[346] Karl Lemieux, telephone interview with author, September 24, 2012.
[347] Karl Lemieux, telephone interview with author, September 24, 2012.

have been miked and the sound engineer has patched the projector body's noises into the PA system between songs, sometimes even within improvisational musical runs).

There is a historical relationship between live musical performances and projection. Examples include the use of projected backgrounds during concerts as visual aids that are not meant to distract from the musical show, and experimental shorts infamously shown during intermissions at punk shows in New York City in the 1970s). But the relationship between Lemieux's projection and musical performance is somewhat more interwoven. Depending on the venue, the musicians might be the primary draw for the audience, or it may be Lemieux's projection. Unlike McClure, whose act *opens* for Throbbing Gristle, Lemieux *plays with* Godspeed You! Black Emperor, so much so that Wikipedia lists him as a member of the band (labeling his instrument as "film projections"). This description is apt insofar as, like a band member, Lemieux has a proscribed composition that he must play, along with the other band members and their respective instruments, for the productive creation of the live song. There are marks that Lemieux must hit in his visual compositions and cues that he responds to, although there is always room for improvisation during the show. For Lemieux, the *liveness* of the projection is an important function in melding the acoustic and visual content. As Lemieux explains:

> The music brings something to the image, and the image brings something to the sound, and altogether it becomes a piece. Also, I've seen a lot of concerts with extremely sloppy projection. I can remember a couple of instances where the show starts and there's already a Super 8mm loop running. So you've already seen the image, and then the band starts to play a song, the song finishes, and the loop is still running. It doesn't actually bring anything to the music, it's just static: it's a visual accessory. I think there's a way to deal with the projector, to either physically touch the lens, or create a shadow: doing something along with what's going on with the music.[348]

---

[348] Karl Lemieux quoted in Brett Kashmere, "Against the Current: A Two-Part Interview with Karl Lemieux (and Daïchi Saïto)," *Incite Journal of Experimental Media,* Issue 1 (Fall 2008-Spring 2009), accessed October 9, 2012, http://www.incite-online.net/lemieuxone.html.

Here, Lemieux emphasizes again the role of the projector-as-instrument, but also the interrelationship between the different performers (whether musicians or projectionists). His attentiveness to live performance has made him one of the most sought-after projector performers in North America.

However, as Lemieux's star rises, so too does the complexity around his choice of instrument, which further exemplifies how the projector's noises are still contested within more mainstream performative art practices. Recently, Lemieux was asked to perform with a prominent Canadian symphony orchestra. After months of planning from afar, Lemieux mentioned to the conductor the noisiness of the projectors. The conductor was taken aback. *Noise? They couldn't have noise during the performance.* With no feasible way to silence the projectors, the performance was cancelled. At another classical concert in Montreal, for which Lemieux was hired to perform with his projectors, after about twenty minutes an enraged audience member stood up and demanded that he stop the projectors, because they were "noisy" and "annoying." The conductor, who had silenced his orchestra, agreed with the angry audience member. A hostile debate over the projector's noise ensued. Eventually, the show continued, *with* Lemieux's participation. Lemieux laughs, when recounting the story, "It was so embarrassing."

His collaborators within the avant-garde community typically embrace the projector's noises, and audiences are not usually so hostile. At Godspeed You! Black Emperor performances, fans are intrigued by Lemieux's projectors and the noises they produce. Because Lemieux's projectors face the stage (projecting onto and above the band), they are often positioned in the middle of the audience's lived environment. From personal experience, I can attest that you can hear the noisiness of the projectors *over* the music (especially when Lemieux is burning the filmstrip—which causes the projectors to scream in an effort to force the filmstrip forward). This caused me to look back, to observe the projectors and Lemieux's actions, which in turn forced me to contemplate the dialogue

between the projectors and the screen, to "see" the three dimensionality and embodiment of cinematic space (without the addition of McCall's smoke, or McClure's verbal haze). Like McClure, Lemieux views his placement in the lived environment of the audience as an important factor in his performances. "It's a privileged place," Lemieux remarks.[349] The energy of the audience gives his something to respond to, and in this sense, Lemieux considers the audience as his final collaborators in the production of cinematic space.

4.6 Conclusion

This chapter has explored the creative potential of the film projector-as-noise-instrument in the period marked by the commercial transition to digital projection, highlighting not only how the film projector and D-Cinema projector sound differently, but also the disparity in how their noises denote labour and how this engenders a different engagement in the production of cinematic space. Not only are there material differences in the film projector's and D-Cinema projector's noises, but also in the way the two technologies are *imagined.* The very real material differences between these modes of projection are of serious concern for the preservation of film, especially with regard to maintaining the creative uses of the film projector's visual and acoustic noises in the exhibition of the film.

While McClure and Lemieux approach the projector's noises differently (the latter using inherent properties of the projector to modulate visual noise, and the former physically modifying the projector to produce modulated visual and acoustic noises), their art practices emphasize the *performativity* of film, through the projector-as-noise-instrument, and the *liveness* of the film screening and/or film event. Thinking of the projector-as-noise-instrument, of the projector as an instrument rather than a playback machine, McClure and Lemieux challenge the dominant perception of

---

[349] Karl Lemieux, telephone interview with author, September 24, 2012.

cinema; the *liveness* and *performativity* of their respective practices emphasize the lived environment of the audience and the potential cinematic space as embodied and immersive. As previously established through this dissertation, viewing the projector-as-noise-instrument is a return to a past paradigm, and a return to an imagined future of film (starting with the experiments of Ginna and Corra around 1910 through the influence of the projector's noises on Cage's sound theory). This (re)new(ed) approach to film is guided by the film projector, by considering the film projector as a *productive instrument*, and perhaps intelligible after the projector's exile from the booth and from commercial practices. D-Cinema, and the digital transition, for this reason, should not be regarded as "the death of film," but, using Lemieux's metaphor, as the fall of cinema, as a seasonal evolution allowing for winter, spring and summer, each holding a novel and innovative approach to film perhaps only ascertainable from the demise of the season past. Within this new paradigm, the future is bright…and very noisy.

Conclusion

This dissertation has provided a media archaeology of the film projector that has offered a new way of understanding cinema, interpreting cinematic space, and extending the discourse on audiovision in general. By looking towards the projector, I have established that cinema can be seen as a projected art (as an expressive rather than inscriptive medium), as live and as performative. My emphasis on the expressive qualities of the medium is linked to my emphasis throughout the dissertation on the avant-garde and its conceptual and material practices both expanding and testing the parameters of cinema, including the projector as apparatus and practice. By providing an alternative history of cinema based on the projector, I have also shown how we can reconstruct and reimagine past media through the new paradigms engendered by our relationship with new media.

The media archaeology of the projector that I have provided is important not only because it fills out a gap in traditional cameracentric and/or screen-focused approaches to film that dominate Film Studies, but also because it reframes the projector as an instrument and as active producer within the cinematic apparatus. Within Film Studies, the projector has been largely viewed as a mere technology of amplification whose primary function is to benignly and passively "play back" messages previously inscribed on the filmstrip. The projector's role as a productive labourer in the creation of cinematic space has generally been ignored. My work begins from the premise that the projector *produces*: beyond projected light, it produces noises, it produces time; it produces space; and it produces the immersive embodied experience of the audience. I have illustrated how looking at the projector confronts us with a more holistic image of cinema in that supplements cameracentric and screen-focused film theories and complements socio-technological, experiential and phenomenological approaches to the cinema. The projector's noises provide us with a vision of the lived environment of cinema and the materiality of the medium.

As I have shown, in traditional approaches to cinema which focus on the film text and the screen space, the projector's noises have been framed as disruptive and dangerous. However, as I have established in this dissertation, the projector's noises make us aware of:

1. the liveness of the act of projection,

2. the performativity of cinema through the projector's *playing* of the filmstrip, and the performative act of experiencing the film, and

3. the embodied space of cinema and the pedagogic potential of simultaneously experiencing a sensation of "being here" and "being there."

As I have shown, by looking at the projector's *noises*, as phenomena that all projectors—whether digital or analogue—produce, but that have tended to be shut out because they are not seen to convey meaning, we are confronted with a materiality and spatiality to the cinematic event.

Drawing on ideas about the relationship between art, technology, and the production of meaning from Cinema Studies, Media Studies, Modernist Studies, Archival Theory, Art History, and Sound Theory, what I have offered in this media archaeology is a new way of *imagining* the projector that frames cinema as what Zielinski calls a "processual art praxis"—that is, as a time-based art practice that is experienced through the act of production, like live music and sound poetry—by placing emphasis on *liveness* and *performativity* within the mediated experience. As I have demonstrated, the process of imagining also allows us access to works of art that are otherwise unavailable, because they no longer exist or because, in an effort of conservation, they are not accessible to the public. This act of imagination can also grant agency to the audience; we can imagine and consequently analyze what we cannot necessarily examine. I have imagined the projector as what Zielinski terms an "untimely media/apparatus/machines" within cinema—a medium that has come to be defined not based on any inherent or intrinsic properties, but from within a truncated understanding of its potential. The process of imagining allows for a creative

reconstruction of not only the mechanics of the projector and its socio-historical function, but also the idea of cinema before and after its currently allotted lifetime (from 1890s to the present day). Because of D-Cinema, we can now see the film projector's underexplored potential as a noise instrument. Looking back from this present, my dissertation has traced how the projector-as-instrument has been used by the avant-garde to explore the boundaries of cinematic technology and our understanding of the production/meaning of cinematic space. Given that cinema, like any medium, exists with a social paradigm which governs the way we use it and the way we perceive it, this dissertation has looked at moments of technological transition, and at the noise which appears at the seams of the ideological fabrication of meaning to show how the cultural significance of "projector noise" has shifted as the technology has continued to develop.

In re-examining the pre-history of the cinema, I have argued that the camera obscura, the telescope and the magic lantern can be seen as early models of projectors, sharing a common socio-technological practice for engaging with and transforming space. The cinematic space created by these technologies were not necessarily illusory, but ontological insofar as they engendered a virtual, immersive space through which the audience could consider their own subjectivity within (an increasingly questionable) objective natural world. However, what distinguishes the film projector from these early pre-cinema modes of projection is its mechanical noises. Moving forward to the birth of cinema, I have explained through cinema's founding myth how the projector's noises not only had a key role in the production of cinematic space, but also anchored the audience within the lived environment of the theatre and to their sense of being here. The first screening of the Lumière brothers' film has been framed as terrifying, and I have argued that this description can be understood less as a reaction to the visual threat of a train than as a performative response. If anything displaced the audience during that first screening, it was the projector's acoustic noises as

indexical of the individual's subordination and subjectivization to the machine, not the images or apparitions projected on the screen.

By excavating a history of artists who have intentionally used the projector with its noises as an instrument to produce new synthetic acoustic and visual phenomena, I have shown how projector noise can make apparent, on the one hand, the inherent liveness and performativity of the medium, and on the other, the ways in which its audience are brought into the production of cinematic space. Turning to the avant-garde, we have seen how artists have embraced the projector's visual and acoustic noises, and how these noises have produced the idea of the projector as an instrument. I have shown how the Futurists Ginna and Corra embraced the projector as an instrument for the produce abstract imagery (visual noise), which in turn, I argued, led Russolo to develop his *intonarumori* based on similar engineering as the Cinématographe for the production of abstract sound (acoustic noise). Ginna, Corra and Russolo shared a desire to produce new, original, and increasingly non-representational phenomena through their instruments. And while they may not have succeeded (at least not according to Mondrian), their innovative ideas served to inspired the use of the projector as a noise instrument for the production of synthetic phenomena, and where the first steps towards imagining the productive potentiality of technologies of reproduction.

As the visibility of the projector and the potential for engagement with its noises became increasingly concealed from the lived environment of the audience (with the dominance of narrative film and the shifted from immersive, pedagogical and experimental experience to one based on illusory space of the screen), the role of the projector also changed. It was during this time and in service of these cultural uses of the cinema that projectors were enclosed in booths, their noises censored, and along with that, some of the potentials of the medium. With the advent of sound-on film technology, when film could offer representations of human voices and recorded sound, the projector too gained its voice as artists used the film's soundtrack (i.e., the space on the film read by

the projector as sound) to produce synthetic sounds unique to the medium. While the theoretical

foundations which grounded experiments in synthetic noise film differed, Fischinger, Moholy-Nagy,

Kubelka, and I shared a common goal—to explore the potential of the projector as a noise

instrument in order to push the beyond known and meaningful noise. And, as I have shown, by

engaging the projector's voice, synthetic noise film indicated the *liveness* and *performativity* of cinema

even when the projector was concealed from the audience.

Finally, as I have discussed with regard to Bruce McClure's and Karl Lemieux's projector

performances (which, as I have discussed, are occurring at a moment when commercial cinema is

transitioning to digital projection), the analog film projector when used as an instrument in live

performances has been returned to the lived environment of the audience. Within this return to this

lived space, the projector has clearly assumed the role as a noise instrument; it is *played* by the

filmmaker in front of the audience. This placement of the projector (or more accurately multiple

projectors) within the viewing space of the audience directs attention back to the projector as a key

instrument in the production of cinematic space and to the dialectical tensions within the apparatus

of cinema but is only achievable with the return of the film projector to the viewing space after it

has been replaced in the booth by the D-Cinema projector, but is return to the early imagining of

the projector-as-instrument proposed by Ginna and Corra.

By focusing on the projector's noises, this dissertation goes beyond a hermeneutics of noise,

that is the interpretation of noise as a text, to look toward how noise can inform the understanding

cinema and engender embodied cinematic space. Looking toward the projector's noises we can see

the rich interplay between the act of production and the final product: the goal of processual art

praxis. However, as I have shown, the projector's noise also helps us to see the apparatus: the

projector's noises appear at the seams of the hegemonic yet narrowly circumscribed uses of the

cinema; looking at them from a socio-technological framework, we can see the ideological

infrastructure through which the cinematic apparatus operates. Thus, the projector's noises can be understood as pedagogical tools, informing us about our relationship to the technology and the embedded ideology within that use.

Cinema is changing. The means of inscription and expression in cinema have become increasingly digital-based. This new digital future brings the need to reevaluate the past and to reconsider the technological history of the apparatus. Like Lemieux, I do not see this as a fall; instead, I view it as a repositioning. Film will become the stuff of the fine arts and the archive. The projector, like any antiquated instrument (e.g., the harpsichord and the typewriter), will become the prized possession of a few collectors, players and aficionados. It is important at such moments of change that we try to understand the cultural shift we are currently experiencing. This dissertation, this media archaeology of the projector, is a step in that direction. By reimagining the projector and rehistoricizing its position within cinema as a whole at this moment of technological transition, this dissertation serves to eke out a future path for the projector based on its deep time as a media. As a filmmaker, scholar and archivist, film and the film projector will remain important parts of my practice. This is not the end, my friends; this is merely the opening of a new past.

Chapter 1: A Media Archaeology of Cinema Through the Projector
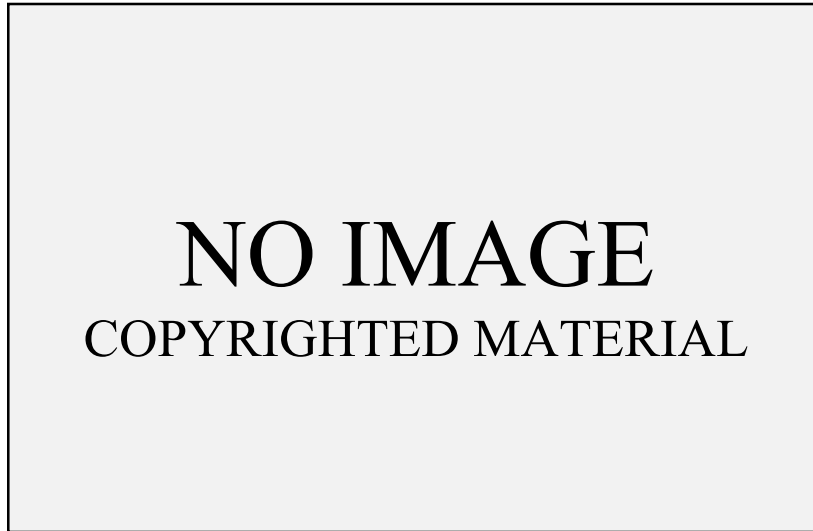
Figure 1.1. Lumière screening at the Salon Indien, circa 1896-1900.
Photograph by unknown. Original source unknown. Copyright unatained. For image of photo, go to http://artnouveaujugendstil.blogspot.ca/2012/02/deux-pionniers-du-cinema-melies-et.html.

Figure 1.2. The Lumière Cinématographe, 1895.
Reproduced with permission from Todd
Gustavson. Stock Photograph © 1999 by
George Eastman House.
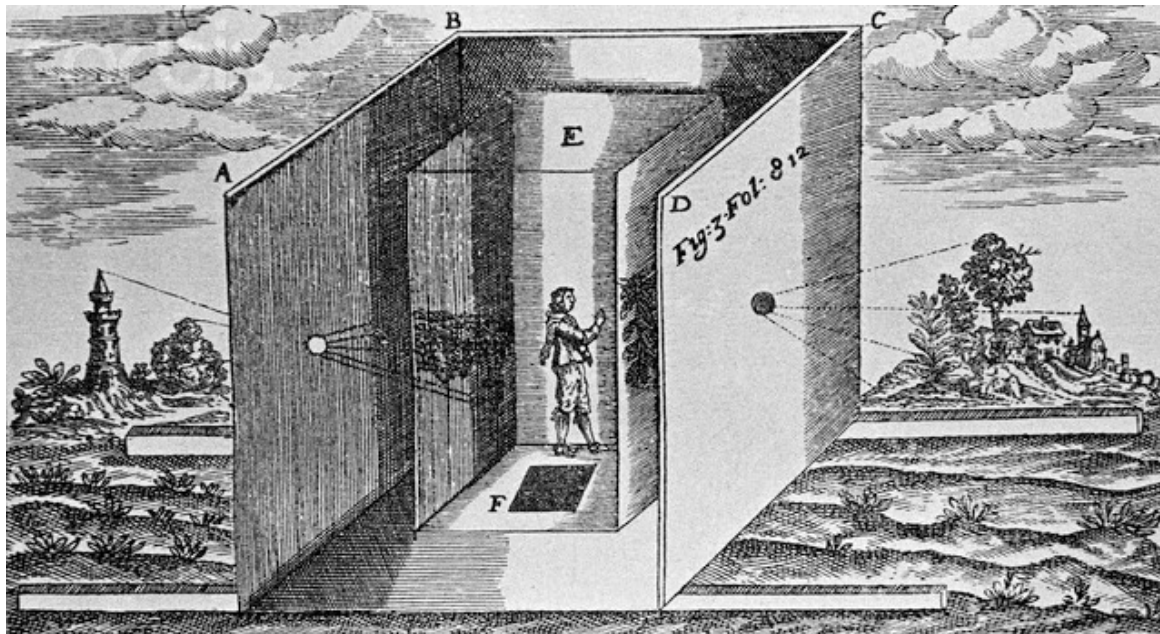
Figure 1.3. Illustration of an embodied camera obscura in Kircher's *Ars magnes lucis et umbtae* , Athanasius Kircher. *Ars magna lucis et umbrae* (Romae, Hermanni Scheus, 1645), 806. Photograph by Kelly Egan. © George Eastman House, Richard and Ronay Menschel Library.
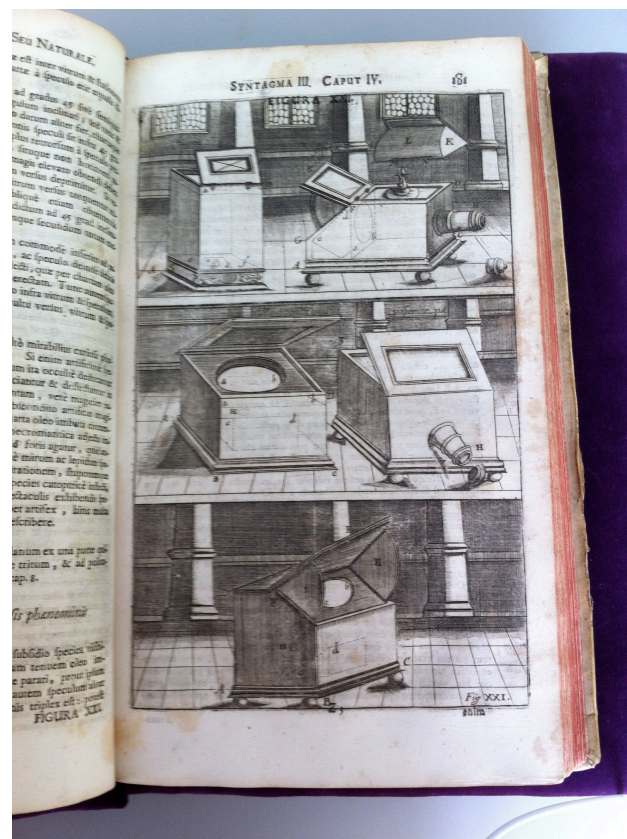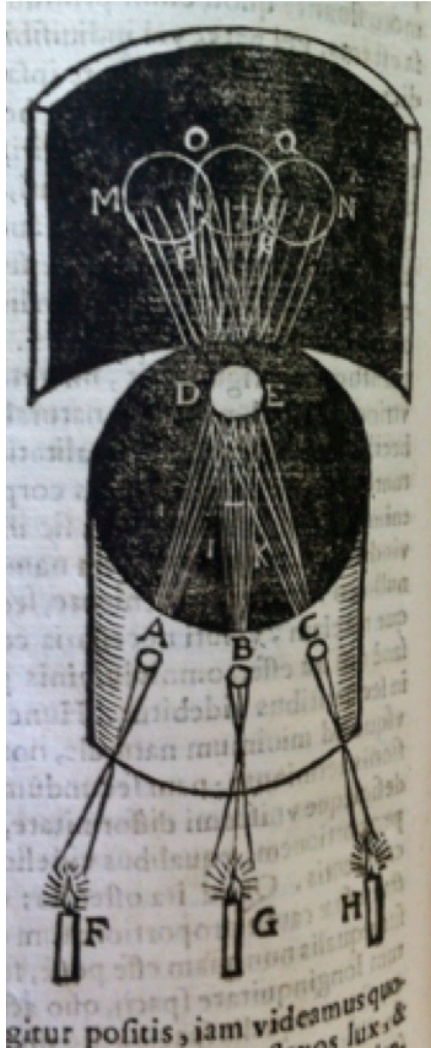

Figure 1.4. Illustration of box model camera obscuras in Johannes Zahn *Oculus artificialis,* (1686). Photograph by Kelly Egan. © George Eastman House, Richard and Ronay Menschel Library.
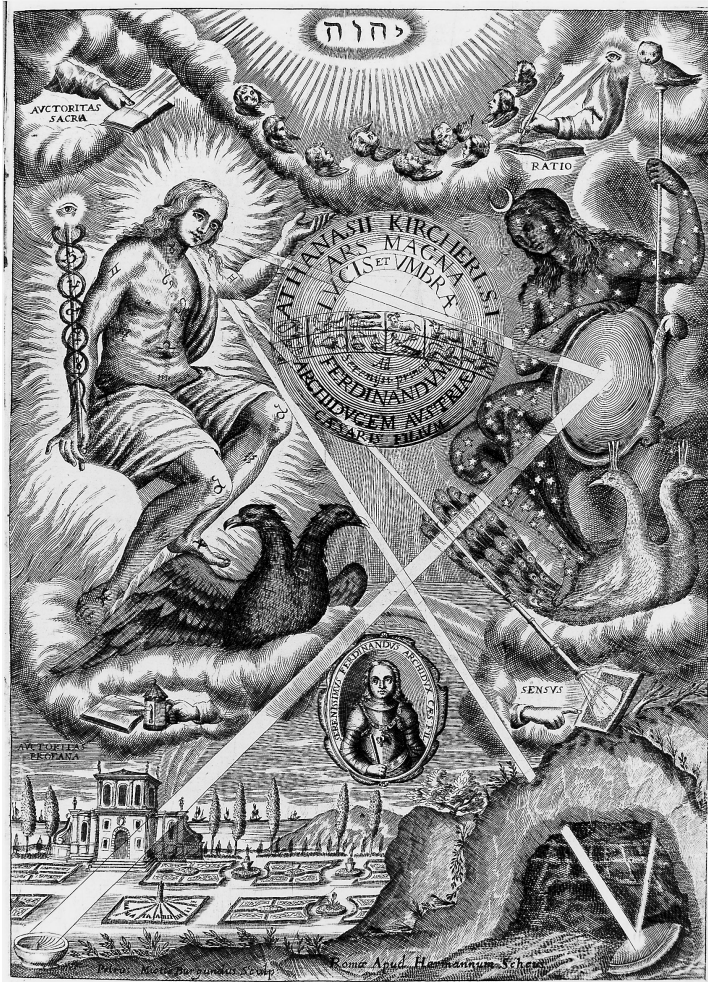
Figure 1.5. Illustration of telescope as projector in Kircher's *Ars magnes lucis et umbtae.* Illustration by Pierre Miotte, frontpiece in Athanasius Kircher, *Ars magna lucis et umbrae* (Romae, Hermanni Scheus, 1645). Photograph by Kelly Egan. © George Eastman House, Richard and Ronay Menschel Library.


Figure 1.6. Close up of telescope as projector in Figure 1.5. Photograph by Kelly Egan © George Eastman House, Richard and Ronay Menschel Library.

Figure 1.7. Image of telescope as projector in Christoph Scheiner's *Rosa Ursina sive sol* (1626-1630), frontpiece. Original source unknown. Copyright unattained. Used without permission For image of photo, go to http://www.princeton.edu/~his291/Scheiner.html.

Figure 1.8. Etienne-Jules Marey, Locomotion (1870). Original source unknown. Copyright unattained. For image of photo, go to http://thenoisyattic.wordpress.com/2010/10/11/locomotion/.

Figure 1.9. The 28mm Pathe Kok (1912), a solid body projector that combined the light source and intermittent mechanism. Photograph by unknown. Original source unknown. Copyright unattained. For image of photo, go to http://www.pathefilm.freeserve.co.uk/twentyeight/28twentyeight.htm.

Figure 1.10. Kircher's catoptric lamp. Kircher, *Ars magna lucis et umbrae* (Romae, Hermanni Scheus, 1645), Photograph by Kelly Egan © George Eastman House, Richard and Ronay Menschel Library.
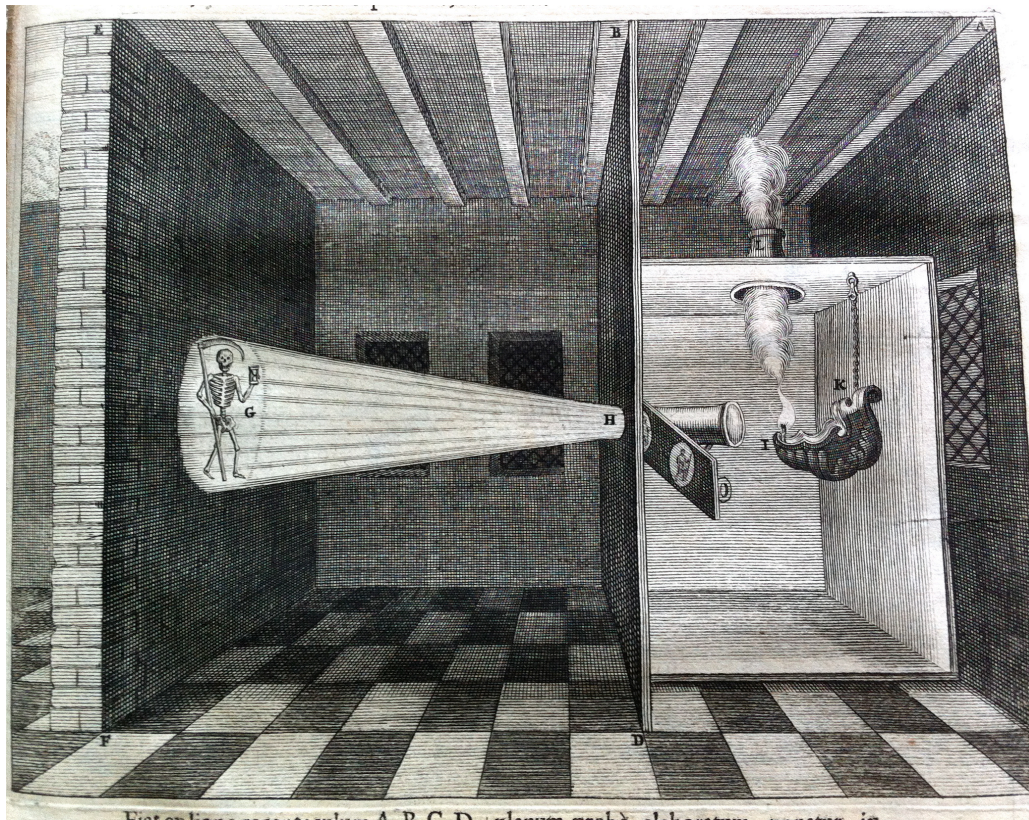
Figure 1.11. Illustration of Kircher's magic lantern show. Kircher, *Ars magna lucis et umbrae* (Romae, Hermanni Scheus, 1671), 769. Photograph by Kelly Egan © George Eastman House, Richard and Ronay Menschel Library.
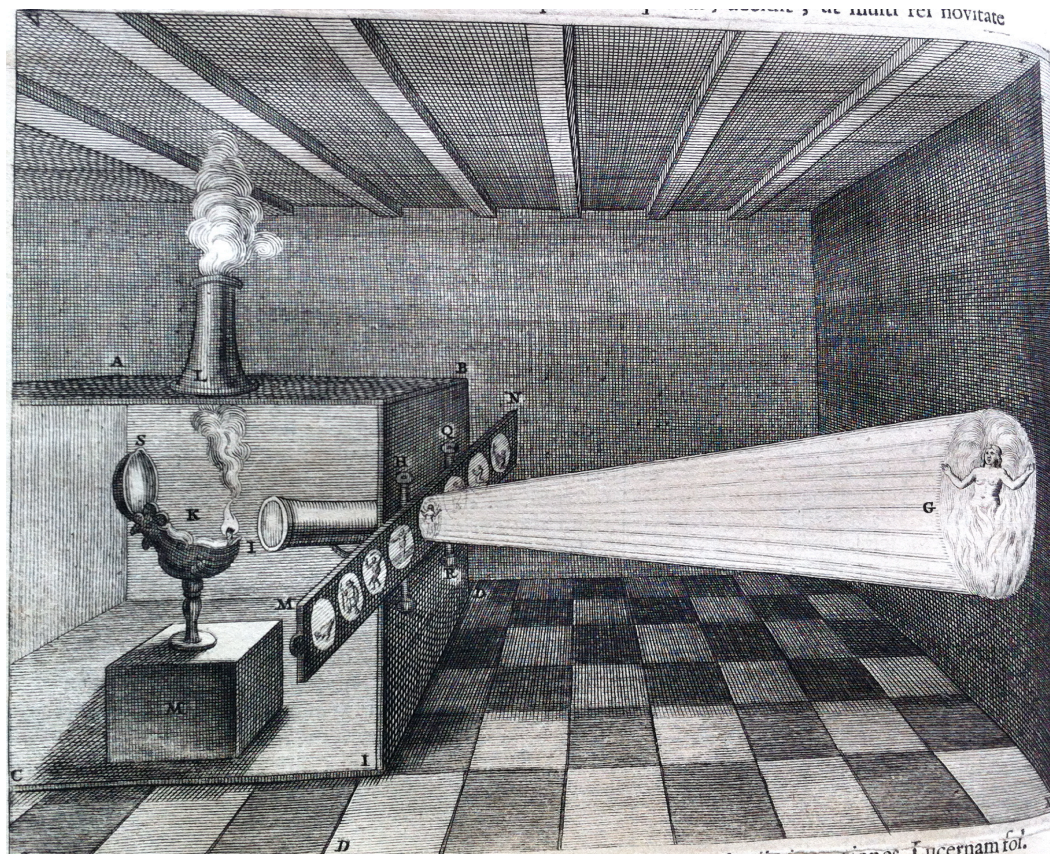
Figure 1.12. Illustration of Kircher's magic lantern show. Kircher, *Ars magna lucis et umbrae* (Romae, Hermanni Scheus, 1671), 768. Kelly Egan © George Eastman House, Richard and Ronay Menschel Library.

Figure 1.13. Illustration of Kircher's concept for multiple projection. Kircher, *Ars magna lucis et umbrae* (Romae, Hermanni Scheus, 1645), 125. Photograph by Kelly Egan © George Eastman House, Richard and Ronay Menschel Library.
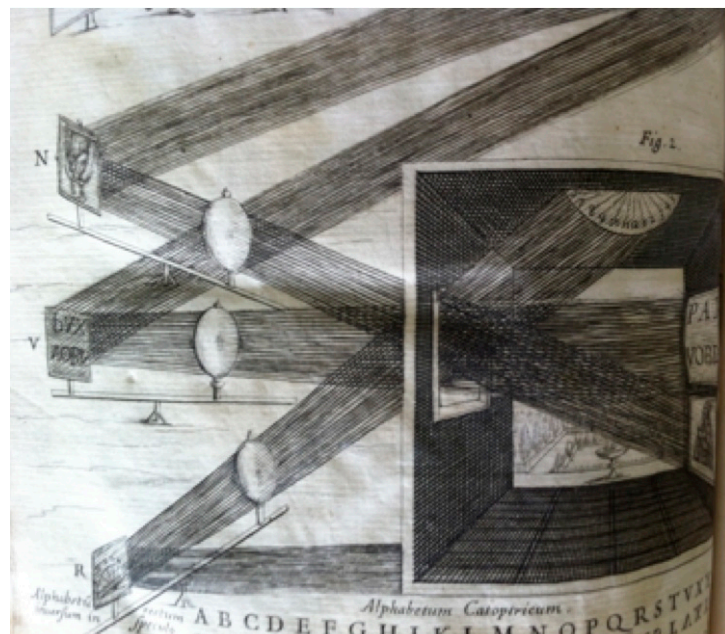
Figure 1.14. Another example of Kircher's ideas for multiple projection. Kelly Egan © George Eastman House, Richard and Ronay Menschel Library.
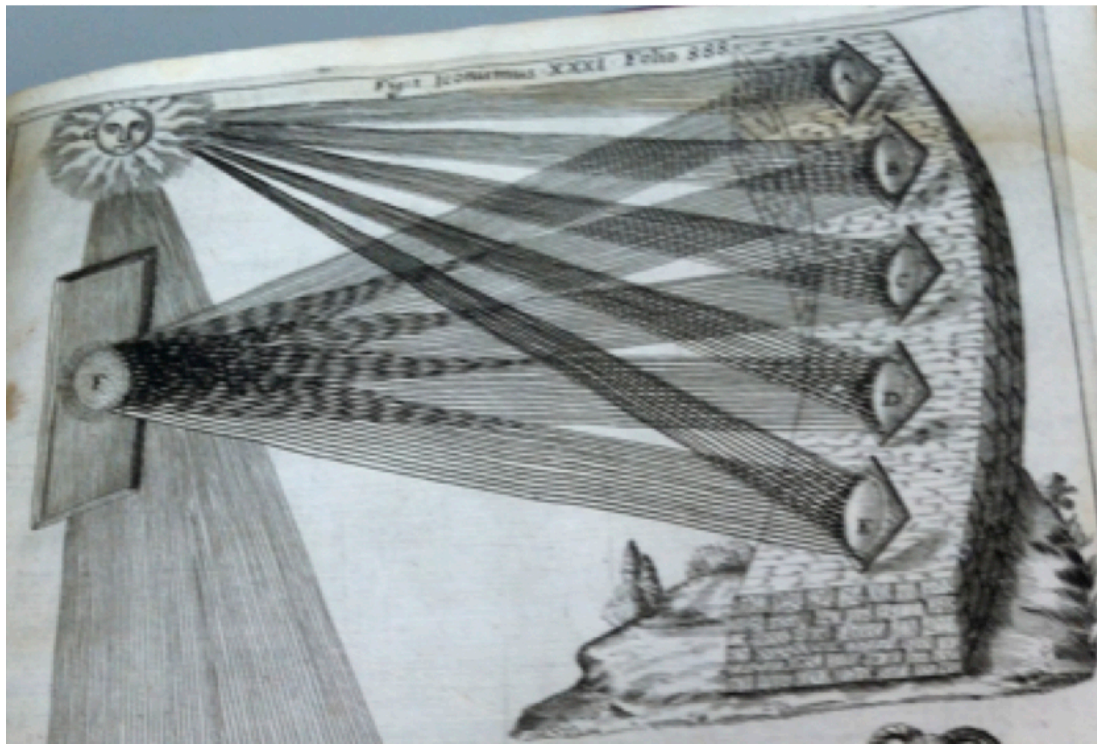
Figure 1.15. Another illustration of Kircher's ideas for multiple projection. Athanasius Kircher. *Ars magna lucis et umbrae* (Romae, Hermanni Scheus, 1671), 889. Kelly Egan © George Eastman House, Richard and Ronay Menschel Library.
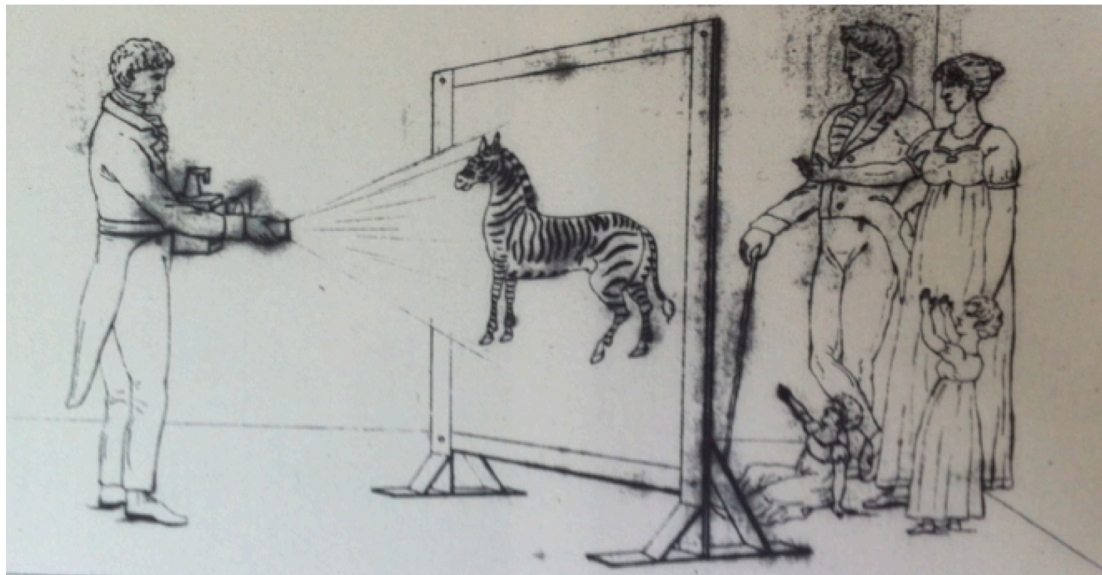
Figure 1.16. Illustration of magic lantern strapped onto lanternist in Philip Carpenter, "A Short Account of the Copper-Plate Sliders, and a Description of the Improved Phantasmagoria," *Elements of Zoology*, (London, 1832), 12. Kelly Egan © George Eastman House, Richard and Ronay Menschel Library.
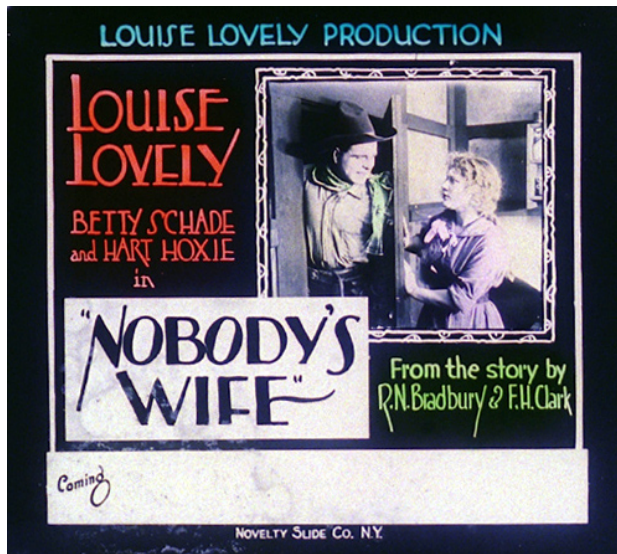
Figure 1.17. Example of "Coming Attractions" magic lantern slide used in movie theatres (this particular one dated 1918). Reproduced with permission from Todd Gustavson. Stock Photograph © 1999 by George Eastman House

Figure 1.18. (Right) Dual lens Biunnial dissolving lantern made by American company Handy, A.D. Reproduced with permission from Todd Gustavson. Stock Photograph © 1999 by George Eastman House.
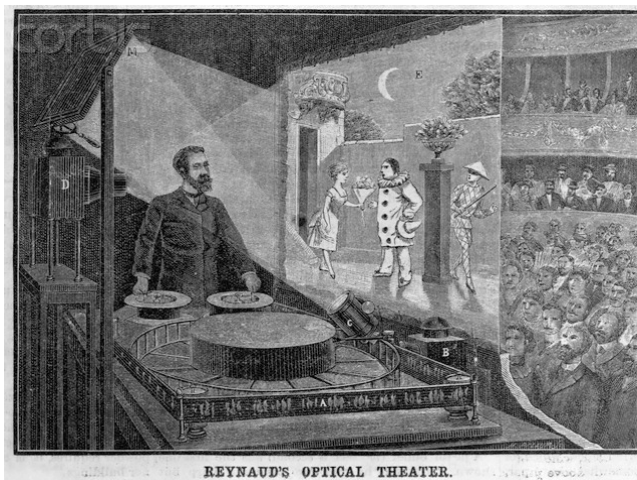
Figure 1.19. (Left) Illustration of Emile Reynaud's Théâtre Optique set up, with rear projection. Stock Photograph © 2010 Wikipedia Commons.
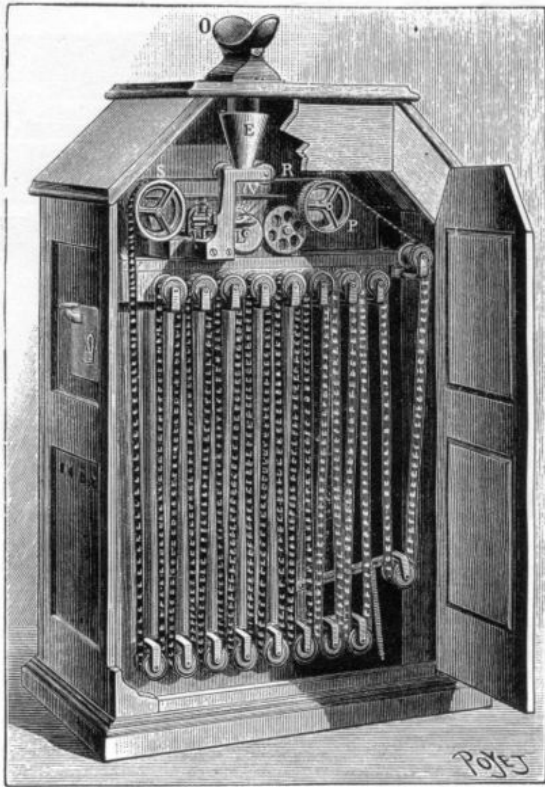
Figure 1.20. Illustration of Edison's Kinetoscope.
Stock Photograph © 2006 by Wikipedia Commons.

Figure 1.21. Photograph of Edison Kinetoscope,
circa 1894. Reproduced with permission from Todd
Gustavson. Stock Photograph © 1999 by George
Eastman House.

Figure 2.1. Image of Arnaldo Ginna's sketch *Poisia dalla terra al cielo*, 1911. Photograph by Peter Zigrossi. Reproduced with permission of Antonio Paolucci. Stock Photography © Vatican Museums.
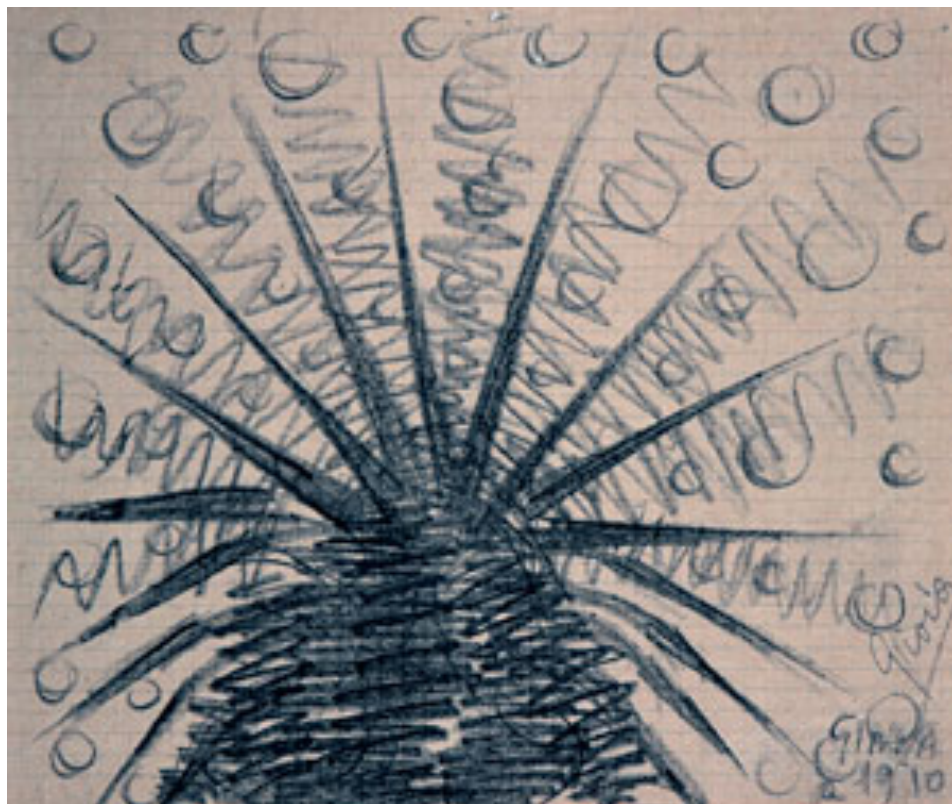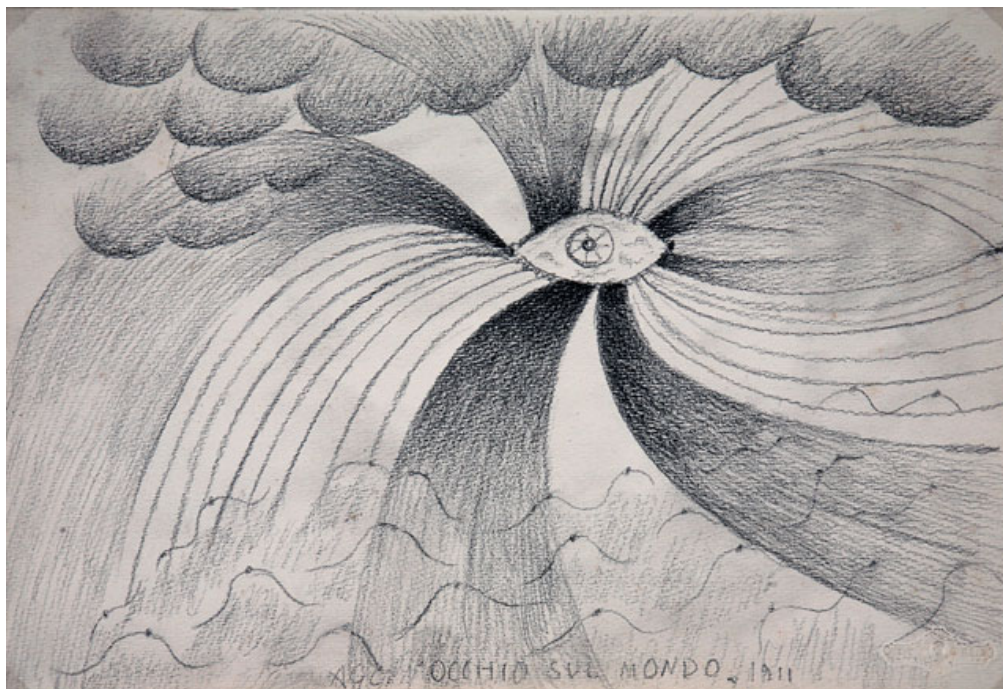

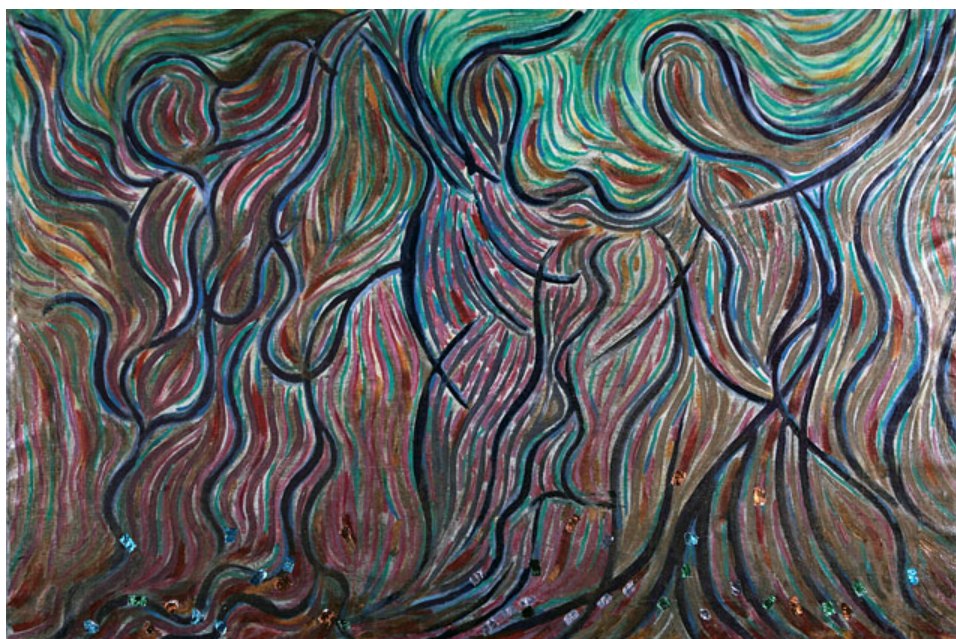Figure 2.2. Image of Arnaldo Ginna's sketch *Gioia intense*, 1910. Photograph by Peter Zigrossi. Reproduced with permission of Antonio Paolucci. Stock Photography © Vatican Museums.

Figure2.3. Image of Arnaldo Ginna's sketch *Studio per ceramiche*, 1919. Photograph by Peter Zigrossi. Reproduced with permission of Antonio Paolucci. Stock Photography © Vatican Museums.

Figure 2.4. Image of Arnaldo Ginn's sketch *Occhio sul mondo*, 1911. Photograph by Peter Zigrossi. Reproduced with permission of Antonio Paolucci. Stock Photography © Vatican Museums.

Figure 2.5. Image of Arnaldo Ginna's drawing *La musica della danza*, 1912. Photograph by Peter Zigrossi. Reproduced with permission of Antonio Paolucci. Stock Photography © Vatican Museums.

Figure 2.6: Image of Arnaldo Ginna's painting *La musica della danza*, 1913. Photograph by Peter Zigrossi. Reproduced with permission of Antonio Paolucci. Stock Photography © Vatican Museums.

Figure 2.7. Image of Arnaldo Ginna's painting *Gioia Serena*, 1940. Photograph by Peter Zigrossi. Reproduced with permission of Antonio Paolucci. Stock Photograph © Vatican Museums.

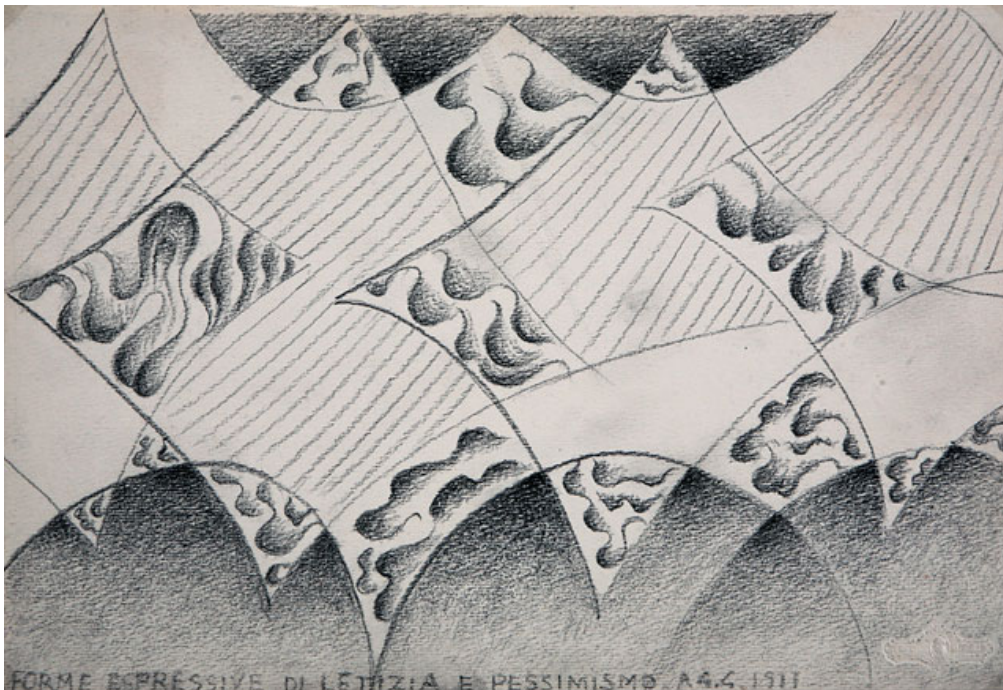Figure 2.8. Image of Arnaldo Ginna's painting *Accordo cromatico*, 1909. Photograph of Peter Zigrossi. Reproduced with permission of Antonio Paolucci. Stock Photograph © Vatican Museums.

Figure 2.9. Image of Arnaldo Ginna's drawing *Musica cromatica - Giove e Venere - Accordo cromatico*, 1967. Photograph by Peter Zigrossi. Reproduced with permission of Antonio Paolucci. Stock Photograph © Vatican Museums.

Figure 2.10. Image of Arnaldo Ginna's painting *Nevrastenia*,1908. Photograph by Peter Zigrossi. Reproduced with permission of Antonio Paolucci. Stock Photograph © Vatican Museums.

Figure 2.11. Arnaldo Ginna's painting *Risveglio a finestra aperta*. 1909. Photograph by Peter Zigrossi. Reproduced with permission of Antonio Paolucci. Stock Photograph © Vatican Museums.

FORME ESPRESSIVE DI LETIZIA E PESSIMISMO A.G. 1911

Figure 2.12. Arnaldo Ginna's sketch *Forme espressive di letizia e pessimismo*, 1911. . Photograph by Peter Zigrossi. Reproduced with permission of Antonio Paolucci. Stock Photograph © Vatican Museums.
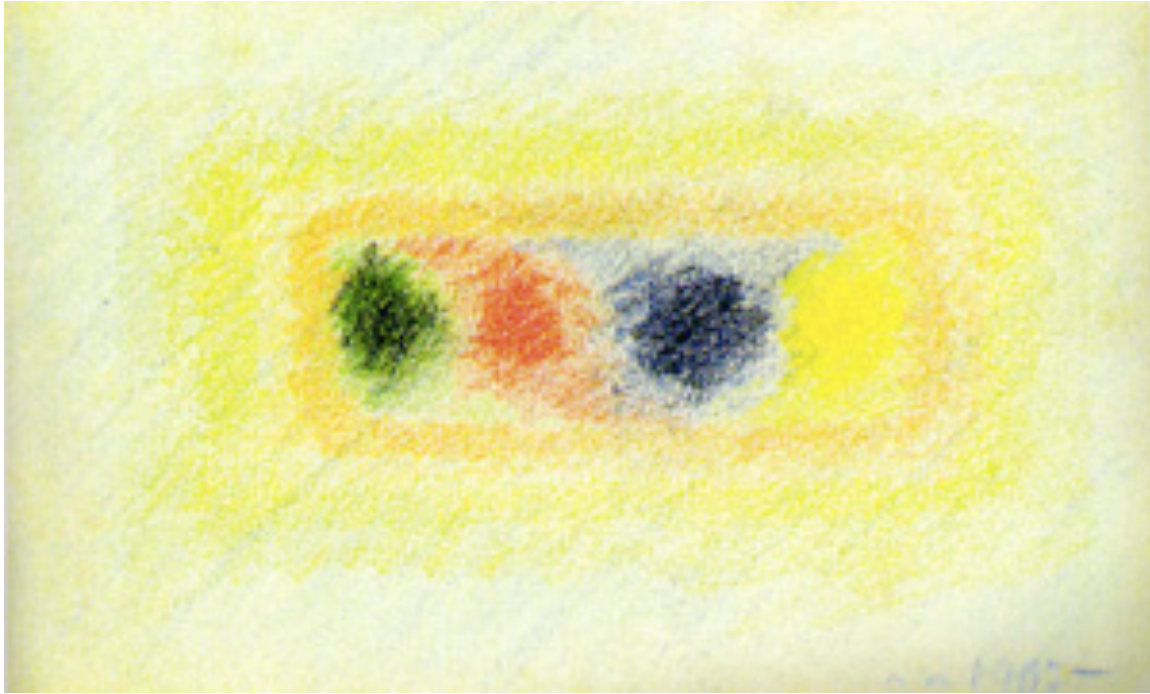
Figure 2.13. Bruno Corra' drawing *Studio di effetti tra quattro colori*, 1907. Photograph by Peter Zigrossi. Reproduced with permission of Antonio Paolucci. Stock Photograph © Vatican Museums.

NO IMAGE
COPYRIGHTED MATERIAL

Figure 2.14. Luigi Russolo and Ugo Piatti with different models of *intonarumori*, circa 1913. Photograph by unknown. Original source unknown. Copyright unattained. For image of photo, go to http://www.unknown.nu/futurism/noises.html.

Figure 2.15. Lumiere Cinématographe set up as projector, circa 1896. Reproduced with permission from Todd Gustavson. Stock photograph © 1999 by George Eastman House.

NO IMAGE
COPYRIGHTED MATERIAL

Figure 2.16: Pathe Cinématographe Renforcé circa 1913. Original source unknown. Copyright unattained. For image of photo, go to http://wichm.home.xs4all.nl/cinelisc.html.

Figure 2.17. Compton Zonophone Gramophone, 1910-1913. Photograph by unknown. Copyright unattained. For image of photo, go to http://www.bankfoothouse.org/collections/.

Figure 2.18. Victor V Phonograph circa 1907. Stock photo © 2006 by Wikipedia Commons. Photographed by Norman Bruderhofer. Wikipedia Commons.
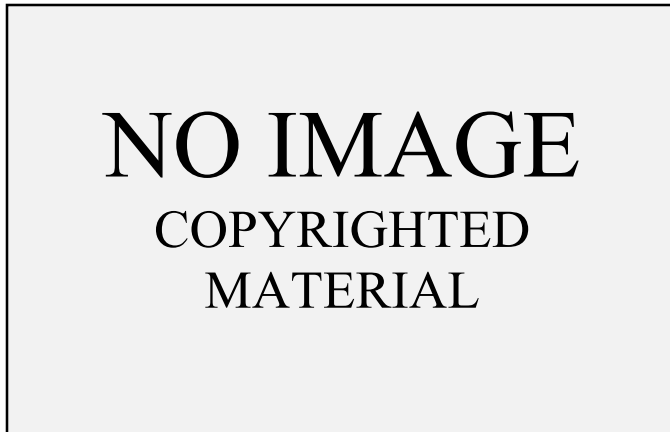
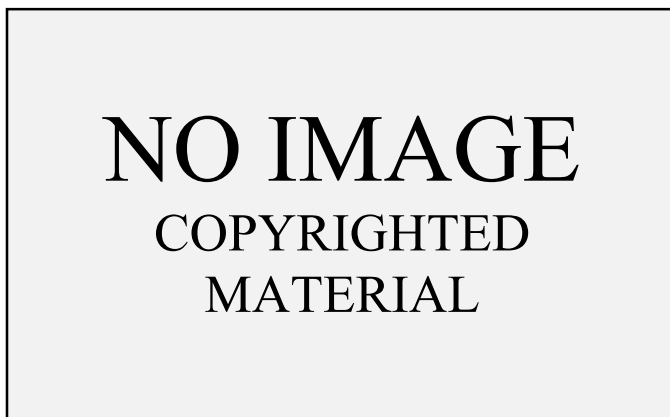Figure 2.19. Berliner A Gramophone, circa 1899. Original source unknown. Copyright unattained. For image of photo, go to http://www.collectionscanada.gc.ca/gramophone/028011-3021.1-e.html.

Figure 2.20. Pathe Cinématographe Renforce circa 1913. Original source unknown. Copyright unattained. For image of photo, go to http://cinematographes.free.fr/pathe-renforce.html.
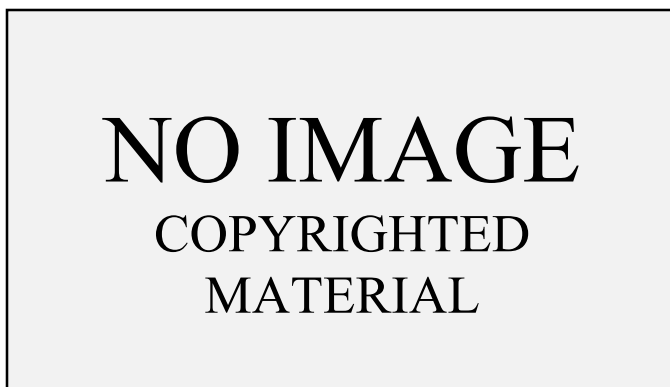
Figure 2.21. Russolo's *Risveglio di una cittá* core for *intonarumori*, 1914. Original source unknown. Copyright unattained. For image of photo, go to http://www.medienkunstnetz.de/works/intonarumori/images/2/.
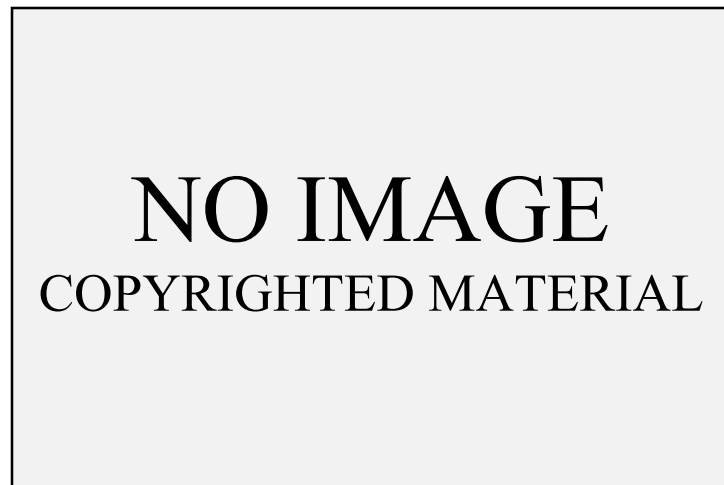
Figure 4.1. Installed D-Cinema projector. Photograph by Russell Lasson. Copyright unattained. For image of photo, go to http://magazine.creativecow.net/article/21st-century-cinema-an-indie-look-at-digital-cinema.

Figure 4.2. (Left) Elmo 16mm slot-load projector. Phtograph by Kelly Egan. Used with permission of author © 2012 by Kelly Egan.

Figure 4.3. 35mm Kineton projector. Photograph by Kelly Egan. Used with permission of author © 2012 by Kelly Egan.
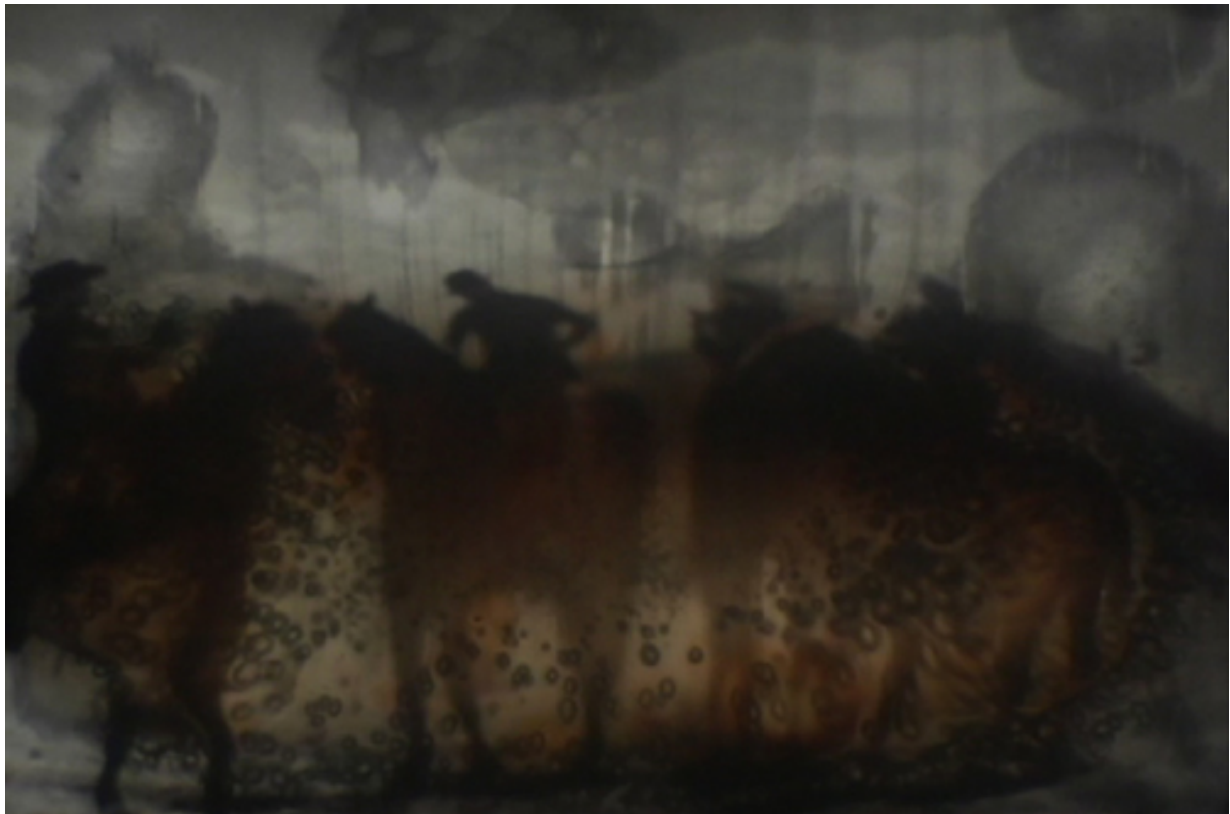

Figure 4.4. Still of burnt frame from Karl Lemieux's film *Western Sunburn.* (2007). Photograph by Karl Lemieux. Reproduced with permission of author © 2007 by Karl Lemieux.

Bibliography

Adorno, Theodor W. and Hans Eisler. *Composing for the Films*. New York: Continuum, 2007.

Adorno, Theodor W. "The Curves of the Needle (1927/1965)." In *Essays on Music*. Edited by Richard Leppert, translated by Susan H. Gillespie, 271-276. Berkeley, California: University of California Press, 2002.

———. "The Form of the Phonograph Record (1934)." In *Essays on Music*. Edited by Richard Leppert, translated by Susan H. Gillespie, 277-283. Berkeley, California: University of California Press, 2002.

———. "On the Fetish-Character in Music and the Regression of Listening (1938)." In *Essays on Music*. Edited by Richard Leppert, translated by Susan H. Gillespie, 288-317. Berkeley, California: University of California Press, 2002.

Aristotle. "Book XV." In *Problemata*. Translated by E.S. Forester. Oxford: Clarendon Press, 1927. Accessed on October 9, 2012. http://archive.org/stream/worksofaristotle07arisuoft/worksofaristotle07arisuoft_djvu.txt.

Attali, Jacques. *Noise: The Political Economy of Music*. Translated by Brian Massumi. 1985. Minneapolis: University of Minnesota Press, 2006.

Auslander, Philip. *Liveness: Performance in a Mediatized Culture*, Second Edition. 1999. Reprint, New York: Routledge, 2008.

Bayley, Roger Child. *Modern Magic Lanterns*. London: L. Upcott Gill, 1896.

Baudry, Jean-Louis. "Ideological Effects of the Basic Cinematographic Apparatus." In *Narrative, Apparatus, Ideology*. Edited by Philip Rosen, 286-298. New York: Columbia University Press, 1986.

Benjamin, Walter. *Arcades Project*. Edited by. Rolf Tiedermann, translated by Howard Eiland and Kevin McLaughlin. Cambridge, Massachusetts: Harvard University Press, 1999.

———. "The Work of Art in the Age of Its Technological Reproducibility: Second Edition." In *The Work of Art in the Age of Its Technological Reproducibility and Other Writings on Media*, edited by Michael William Jennings, Brigid Doherty and Thomas Y. Levin, 19-55. Cambridge, Massachusetts: Harvard University Press, 2008.

Berghaus, Gunter. *Avant-Garde Performance: Live Events and Electronic Technologies*. New York: Palgrave Macmillan, 2009.

———. *Futurism and the Technological Imagination*. Amsterdam: Editions Rodopi, 2009.

———. *Italian Futurist Theatre 1909-1944*. New York: Oxford University Press, 1998.

———.*Theatre, Performance, and the Historical Avant-Garde.* New York: Palgrave Mcmillan, 2005.

Bergson, Henri. "The Idea of Duration." In *Henri Bergson: Key Writings.* Edited by John Mullarkey. 49-77. New York: Continuum, 2002.

Bijsterveld, Karin. *Mechanical Sound: Technology, Culture, and Public Problems of Noise in the Twentieth Century.* Cambridge Massachusetts: The MIT Press, 2008.

Boccioni, Umberto. "Futurist Painting and Sculpture (extracts) (1914)." In *Futurist Manifestos.* Edited by Umbro Apollonio. 172-181. New York: Viking Press, 1970.

———. "Plastic Dynamism (1913)." In *Futurist Manifestos.* Edited by Umbro Apollonio. 92-95. New York: Viking Press, 1970.

———. "The Plastic Foundations of Futurist Sculpture and Painting (1913)." In *Futurist Manifestos.* Edited by Umbro Apollonio. 88-91. New York: Viking Press, 1970.

Brakhage, Stan. "Poetry and Film." In *Essential Brakhage.* Edited by Bruce R. McPherson, 174-191. Kingston, New York: Documentext, 2001.

Brown, Barclay. "The Noise Instruments of Luigi Russolo." *Perspectives of New Music* 20, No. 1 (Autumn, 1981-Summer 1982): 31-48.

———. Introduction to *The Art of Noises.* Translated by Barclay Brown, 1-21. New York: Pendagon Press, 1986.

Brown, Harold. *Physical Characteristics of Early Films as Aids to Identification.* Brussels, Belgium: FIAF, 1990.

Busquet, Jordi Pons i. *Image Makers: From Shadow Theatre to Cinema.* Girona: Fundació Museu del Cinema-Col Iecció Tomàs Mallol, 2006.

Cage, John. "The Future of Music: Credo (1937)," *Silence: Lectures and Writings.* Middletown, Connecticut: Wesleyan University Press, 1973©1961.

Carroll, Noël. "Defining the Moving Image." In *Philosophy of Film and Motion Pictures.* Edited by Noël Carroll and Jinhee Choi, 113-134. Malden, Massachusetts: Blackwell Publishing Ltd, 2006.

Ceram, C.W. *Archaeology of the Cinema.* New York: Harcourt, Brace & World, Inc, 1965.

Cherchi Usai, Paolo. *The Death of Cinema.* London: the British Film Institute, 2001.

———. *Silent Cinema: An Introduction.* 2000. Reprint, London, England: British Film Institute, 2010.

Chessa, Luciano. Luigi Russolo, *Futurist: Noise, Visual Arts and the Occult.* Berkeley, California: University of California Press, 2012.

Chion, Michel. *Audio-Vision.* Translated and edited by Claudia Gorbman. New York: Columbia University Press, 1994.

Christie, Ian. "Toys, Instruments, Machines: Why the Hardware Matters." In *Multimedia Histories: From the Magic Lantern to the Internet.* Edited by James Lyons and John Plunkett. Exeter: University of Exeter Press, 2007.

Collarile, Lucia. "Ginna futurista." Official Website of Arnaldo Ginna and Bruno Corra, Accessed on October 9, 2012. http://www.ginnacorra.it/ginna/ginna_futurista.html.

———. "Corra futurista." Official Website of Arnaldo Ginna and Bruno Corra, Accessed on October 9, 2012. http://www.ginnacorra.it/corra/corra_futurista.html.

Corra, Bruno. "Abstract Cinema—Chromatic Music." In *Futurist Manifestos.* Edited by Umbro Apollnio. New York: The Viking Press, 1970.

Coulson, Thomas. "Philadelphia and the Development of Motion Picture." *The Journal for the Franklin Institute* 262, no. 1 (July, 1956): 1-16.

Crary, Jonathan. *Techniques of the Observer.* 1990. Reprint, Cambridge, Massachusetts: The MIT Press, 1992.

Crompton, Dennis, David Henry and Stephen Herbert, eds. *Magic Images: The Art of Hand-Painted and Photographic Lantern Slides.* London: The Magic Lantern Society of Great Britain, 1990.

Da Vinci, Leonardo. "How the Image of Objects Received by the Eye Intersect Within the Crystalline Humour of the Eye." In *The Notebooks of Leonardo Da Vinci*, Volume 1. Edited by Jean Paul Richter, translated by Mrs. R. C. Bell. Mineola, New York: Dover Publications, 1970.

Darlington, William Aubrey. *Through the Fourth Wall.* London: Chapman and Hall Ltd, 1922.

Doane, Mary Ann. *The Emergence of Cinematic Time.* Cambridge, Massachusetts: Harvard University Press, 2002.

Dolbear, A.E. *The Art of Projection.* Boston: Lee and Shepard, Publishers, 1877.

Doy, Gwen. *In Picturing the Self: Changing Views of the Subject in Visual Culture.* New York: I.B. Tauris, 2005.

Eisenstein, Sergei. *The Film Sense.* Translated and edited by Jay Leyda. 1842. Reprint, New York: Harcourt, Brace and World, Inc., 1947.

Elder, R. Bruce. *Harmony and Dissent: Film and Avant-Garde Art Movements in the Early Twentieth Century.* Waterloo, Ontario: Wilfred Laurier University Press, 2008.

Fassin, Gustave. "Something About the Early History of the Microscope." *The Scientific Monthly* 38, no. 5 (May, 1934): 452-459

Fischinger, Oskar. "Klingende Ornamente /Sounding Ornaments," *Kraft Und Stoff, Deutsche Allgemeine Zeitung,* 30 (July 28, 1932). Accessed October 9, 2012. http://www.centerforvisualmusic.org/Fischinger/SoundOrnaments.htm.

Fossati, Giovanna. *From Pixel To Grain.* Amsterdam: Amsterdam University Press, 2009.

Frampton, Hollis. "A Lecture." In *On the Camera Arts and Consecutive Matters.* Edited by Bruce Jenkins. Cambridge, Massachusetts: The MIT Press, 2009.

Frye, Brian. "In Conversation: Bruce McClure with Brian Frye," *The Brooklyn Rail: Critical Perspectives on Arts, Politics and Culture.* July-August 2006. Accessed October 9, 2012. http://www.brooklynrail.org/2006/07/film/bruce-mcclure-with-brian-frye.

Fujifilm Global. "Announcement on Motion Picture Film Business of Fujifilm." Accessed October 9, 2012. http://www.fujifilm.com/news/n120913.html.

Ginna, Arnaldo and Bruno Corra. "Art de l'avenir." In *Le Cinéma Futuriste.* Paris: Éditions Paris Experimental, 2008.

Gomery, Douglas. *The Coming of Sound: A History.* New York: Routledge, 2005.

Grau, Oliver. *Virtual Art: From Illusion to Immersion.* Cambridge, Massachusetts: The MIT Press, 2003.

Gregory, Richard L. *Eye and Brain: The Psychology of Seeing.* Princeton, New Jersey: Princeton University Press, 1997.

Griffiths, Allison. *Shivers Down Your Spine: Cinema, Museums and the Immersive View.* New York: Columbia University Press, 2008.

Gunning, Tom. "An Aesthetic of Astonishment: Early Film and the Incredulous Spectator." In *Viewing Positons: Ways of Seeing Film.* Edited by Linda Williams, 114-133. New Brunswick, New Jersey: Rutgers University Press, 1995.

Halter, Ed. "Powers of Projection," *Artforum International.* 48.5 (3 January 2010): 182-185. Accessed October 9, 2012.

Hammond, John. *The Camera Obscura: A Chronicle.* Bristol: Adam Hilger Ltd., 1981.

Hardison, O.B. Jr. *Poetics and Praxis, Understanding and Imagination.* Athens, Georgia: University of Georgia Press, 1997.

Heard, Mervin. *Phantasmagoria: the Secret Life of the Magic Lantern.* Hastings: The Projection Box, 2006.

Hegarty, Paul. *Noise/Music.* New York: Continuum, 2007).

Hines, Thomas. "Then Not Yet 'Cage.'" In *John Cage: Composed in America.* Edited by Marjorie Perloff and Charles Junkerman, 65-99. Chicago, Illinois: University of Chicago Press, 1994.

Hopwood, Henry. *Living Pictures: Their History, Photo-Production and Practical Working.* 1899. Reprint, New York: Arno Press, 1970.

Iles, Chrissies, editor. *Into the Light: The Projected Image in American Art 1964-1977.* New York: Whitney Museum of American Art, 2001.

Janiak, Larry and Dave Daruszka, "Oskar Fischinger: An Interview with Elfriede Fischinger." In *Zoetrope: The Publication of Commercial and Experimental Media* 3, (March 1979). Accessed October 9, 2012. http://www.oskarfischinger.org/EFZoetrope.htm.

Jennings, Michael William. "The Production, Reproduction and Reception of the Work of Art," In *The Work of Art in the Age of Its Technological Reproducibility and Other Writings on Media.* Edited by Michael William Jennings, Brigid Doherty and Thomas Y. Levin, 19-55. Cambridge, Massachusetts: Harvard University Press, 2008.

Kahn, Douglas. "Introduction: Histories of Sound Once Removed." In *Wireless Imagination.* Edited by Douglas Kahn and Gregory Whitehead, 1-30. 1992. Reprint, Cambridge, Massachusetts: The MIT Press, 1994.

Kashmere, Brett. "Against the Current: A Two-Part Interview with Karl Lemieux (and Daïchi Saïto)." In *Incite Journal of Experimental Media*, Issue 1. Fall 2008-Spring 2009.

Kircher, Athanasius. *Ars magna lucis et umbrae.* Romae, Hermanni Scheus, 1645.

———. *Ars magna lucis et umbtae.* Amstelodami: Apud Joannem Janssonium a Waesberge and Haerdes Elizaei Weyerstraet, 1671.

Kittler, Friedrich A. *Gramophone, Film, Typewriter.* Translated by Geoffrey Winthrop-Young and Michael Wutz. Stanford, Californica: Stanford University Press, 1999.

Kittler, Friedrich. *Optical Media.* Malden, Massachusetts: Polity Press, 2010.

Klinger, Barbara. "Cinema's Shadow: Reconsidering Non-Theatrical Exhibition." In *Going to the Movies: Hollywood and the Social Experience of Cinema.* Edited by Richard Maltby, Melvyn Stokes and Robert C. Allen, 273-290. Exeter, UK: University of Exeter Press, 2007.

Kluitenberg, Eric. "On the Archaeology of Imaginary Media." In *Media Archaeology: Approaches, Application and Implications.* Edited by Erkki Huhtamo and Jussi Parikka. Berkeley, California: University of California Press, 2011.

Kubelka, Peter. "The Theory of Metrical Film." In *The Avant-Garde Film: A Reader of Theory and Criticism.* Edited by P. Adams Sitney. 139-159. New York: New York University Press, 1978.

Lambert, Reverend F.C. *Lantern Slide Making.* London: Hazell, Watson and Viney LTD, 1901.

De Lauretis, Teresa. *Alice Doesn't: Feminism, Semiotics, Cinema* (Bloomington, Indiana: University of Indiana Press, 1984.

Lefebvre, Henri. *The Production of Space.* Translated by Donald Nicholson-Smith. 1974. Reprint, Malden, Massacuhusetts: Blackwell Publishing, 1991.

———. *Rhythmanalysis.* New York: Continuum, 2004.

Levi, Erik. "Futurist Influences upon Early Twentieth-Century Music." *International Futurism in the Arts and Literature.* Edited by Gunter Berghaus. Berlin: deGruyter, 2000.

Lista, Giovanni. *Le cinéma futuriste.* Paris: Éditions Paris Experimental, 2008.

Loiperdinger, Martin. "Lumière's Arrival of the Train: Cinema's Founding Myth. In *The Moving Image* 4, No 1 (Spring 2004): 98-118.

Lumière, Louis. "The Lumière Cinematograph." *Journal of the Society of Motion Picture Engineers* 27 (Dec 1936): 640-647.

Mannoni, Laurent. *The Great Art of Light and Shadow: Archaeology of the Cinema.* Translated by Richard Crangle. Exeter, Devon: University of Exeter Press, 2000.

———. *Trois siècles de cinema: de la lanterne magique au Cinématographe.* Paris: Éditions de la Réunion des musées nationaux, 1995.

Mannoni, Laurent, Donata Pesenti Campagnoni and David Robinson. *Light and Movement: Incunabula of the Motion Picture.* Pordonone, Italy: Le Giornate del Cinema Muto, 1995.

Marinetti, Filippo Tommaso, Bruno Corra, Emilio Settimelli, Arnaldo Ginna, Giacomo Balla and Remo Chiti. "The Futurist Cinema." In *Futurist Manifestos.* Edited by Umbro Apollonio. 207-219. New York: Viking Press, 1970.

Marinetti, Filippo Tommaso, Emilio Settimelli and Bruno Corra. "The Futurist Synthetic Theatre (1915)." In *Futurist Manifestos.* Edited by Umbro Apollonio. 183-196. New York: Viking Press, 1970.

Marinetti, Filippo Tommaso. "Destruction of Syntax—Imagination without strings—Words-in-Freedom (1913)." In *Futurist Manifestos.* Edited by Umbro Apollonio. 95-106. New York: Viking Press, 1970).

———. "The Exploiters of Futurism." In *Critical Writings.* Edited by Gunter Berghaus, translated by Doug Thompson. New York: Farrar, Straus, and Giroux, 2006.

———. "The Founding and Manifesto of Futurism (1909)." In *Futurist Manifestos.* Edited by Umbro Apollonio. 19-24. New York: Viking Press, 1970.

———. "Technical Manifesto of Futurist Literature." In *Futurist Manifestos.* Edited by Umbro Apollonio. New York: Viking Press, 1970).

———. "The Variety Theatre (1913)." In *Futurist Manifestos*, Edited by Umbro Apollonio. New York: Viking Press, 1970.

McLuhan, Marshall. *Understanding Media: the Extension of Man.* 1964. Reprint, Cambridge, Massachusetts: The MIT Press, 1994.

———. *Understanding Me.* Edited by Stephanie McLuhan and David Staines. Toronto, Ontario: McCllelland and Stewart Ltd., 2003.

McLuhan, Marshall and Eric McLuhan. *Laws of Media.* Toronto, Ontario: University of Toronto Press, 1988.

McLuhan, Marshall and Harley Parker, *Through the Vanishing Point (New York: Harper & Row, Publishers Inc.,1968), xxiii.*

Mekas, Jonas. "Interview with Peter Kubelka." In *Structural Film Anthology.* Edited by Peter Gidal, 98-108. 1976. Reprint, London: British Film Institute, 1978.

Mitry, Jean. *Histoire du Cinéma I* (1895-1914). Paris: Éditions universitaires, 1967.

Moholy-Nagy, László. "Contemporary Typography—Aims, Practices, Criticism." In *Moholy-Nagy.* Edited by Krisztina Passuth, translated by Éva Grusz et al., 293-295. London: Thames and Hudson Ltd., 1985.

———. "New Film Experiments." In *Moholy-Nagy.* Edited by Krisztina Passuth, translated by Éva Grusz et al., 319-323. London: Thames and Hudson Ltd., 1985.

———. "New Form in Music: Potentialities of the Phonograph." In *Moholy-Nagy.* Edited by Krisztina Passuth, translated by Éva Grusz et al., 291-292. London: Thames and Hudson Ltd., 1985.

———. "Problems of the Modern Film." In *Moholy-Nagy.* Edited by Krisztina Passuth, translated by Éva Grusz et al., 311-319. London: Thames and Hudson Ltd., 1985.

———. "Production—Reproduction." In *Moholy-Nagy.* Edited by Krisztina Passuth, translated by Éva Grusz et al., 289-290. London: Thames and Hudson Ltd., 1985.

———. *Vision in Motion.* 1947. Reprint, Chicago: Paul Theobald and Company, 1965.

Mondrian, Piet. "The Manifestation of Neo-Plasticism in Music and the Italian Futurists' Bruiteurs (1921)." In *The New Art—The New Life.* Edited and translated by Harry Holtzman and Martin S. James. Bostob: G.K. Halland Co., 1986.

Moritz, William. *Optical Poetry: The Life and Work of Oskar Fischinger.* Bloomington, Indiana: Indiana University Press, 2004.

O'Brien, Charles. *Cinema's Conversion to Sound.* Bloomington: Indiana University Press, 2005.

Orban, Clara Elizabeth. The Culture of Fragments: Futurism and Surrealism. Amsterdam: Editions Rodopi B.V., 1997.

Ottinger, Didier. "Cubisme + futurisme = cubofutruisme." In Le Futurisme à Paris (Paris: Centre Pompidou, 2009).

Plato. "Book VII." The Republic. Translated by. Benjamin Jowett. The Project Gutenberg EBook: August 27, 2008. Accessed October 9, 2012. http://www.gutenberg.org/files/1497/1497-h/1497-h.htm.

Porta, Giambattista della. "Book 17: Of Strange Glasses, Chapter VI: Other Operations of a Concave-Glass." In *Natural Magick*. Translated by Unknown. London: Thomas Young and Samuel Speed, 1658. Accessed October 9, 2012. http://www.mindserpent.com/American_History/books/Porta/jportac17.html#bk17VI.

———. *Magiae naturalis libri viginti*. Rothomagi: Joannis Berthelin, 1650.

Quigley, Martin Jr. *Magic Shadows: The Story of the Origin of Motion Pictures*. Washington D.C.: Georgetown University Press, 1948.

Richter, Hans. "The Film as an Original Art Form." In *College Art Journal* 10, No. 2 (Winter, 1951): 157-161.

Rossell, Deac. *Living Pictures: The Origins of the Movies*. Albany, New York: State University of New York Press, 1998.

Russolo, Luigi. *The Art of Noises*. Translated by Barclay Brown. New York: Pendagon Press, 1986.

Sachse, Julius F. "Philadelphia's Share in the Development of Photography." In *The Journal for the Franklin Institute* 135, no. 4 (April, 1893): 271-287.

Seiberling, Grace. *Amateurs, Photography and the Mid-Victorian Imagination*. Chicago: University of Chicago Press, 1986.

Serafin, Stefania and Amalia de Götzen. "An Enactive Approach to the Preservation of Musical Instruments Reconstructing Russolo's Intonarumori." In *Journal of New Music Research* 38, no. 3, (2009): 231-239.

Shipman, David. *The Story of Cinema, Volume One*. London: Hodder and Stougton, 1982.

Silverman, Kenneth. *Begin Again: A Biography of John Cage*. 2010. Reprint, Evanston, Illinois: Northwestern University Press, 2012.

Singer, Ben. "Early Home Cinema and the Edison Home Projecting Kinetoscope." In *Film History* 2, No, 1 (Winter, 1988): 37-69.

Sitney, P. Adams. "Structural Film." In *Experimental Cinema Reader*. Edited by Wheeler Winston Dixon and Gwendolyn Audrey Foster. New York: Routledge, 2002.

———. *Visionary Film: The American Avant-Garde 1943-2000*, Third Edition. 1974. Reprint, New York: Oxford University Press, 2002.

Slade, Mark. *Language of Change*. Toronto: Holt, Rinehart and Winston of Canada, Ltd, 1970.

Sobchack, Vivian. *The Address of the Eye: A Phenomenology of Film Experience*. Princeton New Jersey: Princeton University Press, 1992.

———. *Carnal Thoughts: Embodiment and Moving Image Culture*. Berkeley, California: University of California Press, 2004.

Stokley, James. "Did Roger Bacon have a Telescope?" In *The Science News-Letter* 14, No. 386 (Sep. 1, 1928): 125-126, 133-134.

Sontag, Susan. *On Photography*. 1977. Reprint, New York: Farrar, Strauss and Giroux, 2001.

Van Holden, Albert. "The Invention of the Microscope." In *Transactions of the American Philosophical Society*, New Series 67, no. 4 (1977): 1-67.

Venn, Edward. "Rethinking Russolo." In *Tempo* 64, no. 251 (January 2010): 8-16.

Vertov, Dziga. "The Birth of the Kino-Eye." In *Kino-Eye: The Writings of Dziga Vertov*. Edited by Annette Michelson, translated by Kevin O'Brien, 40-42. Berkeley: University of California Press, 1984.

Wasson, Haidee. "The Reel of the Month Club." In *Going to the Movies: Hollywood and the Social Experience of Cinema*. Edited by Richard Maltby, Melvyn Stokes and Robert C. Allen, 217-234. Exeter, UK: University of Exeter Press, 2007.

Watkins, Glenn. *Soundings: Music in the Twentieth Century*. New York: Schirmer Books, 1988.

Wright, Terence. *Visual Impact Culture and the Meaning of Images*. New York: Berg, 2009.

Zahn, Johann. *Oculus artificialis teledioptricus sive telescopium*. Herbipoli: Quirini Heyl, Bibliopolæ Aulica-Academici, 1685-86.

Zielinski, Siegfreid. *Audiovisions: Cinema and Television as Entr'actes in History*. Amsterdam: Amsterdam University Press, 1999.

———. *Deep Time of the Media*. Cambridge, Massachusetts: The MIT Press, 2006.

Zhang, Yingjin. *Cinema, Space, and Polylocality in a Globalizing China*. Honolulu, Hawai'i: University of Hawai'i Press, 2010.