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Notions of a Radical Moving Image Archive as a Problematic

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Notions of a Radical Moving Image Archive as a Problematic

by

Amanda Egbe

A thesis submitted in partial fulfilment for the degree of

Master of Philosophy

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Abstract

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Amanda Egbe

The concerns of this thesis stem from the reflections of a filmmaker and the recognition of artists’ use of archival materials in moving image practice as an intervention in making visible aspects of experience that are implicit and often left out of linear accounts of a history of technologies. The implications of the thesis are that in the strategic mobilisation of moving image artefacts in the archive in their inter-relationship of making and viewing, concerns over what is not present, what is missing, what is un-archivable, what is fragmentary, and the copy are alleviated.

The thesis conceives of the Mnemosyne Radical Moving Image Archive as an artistic archival practice to challenge traditional approaches to archiving moving images. The project is proposed in order to overcome dualistic conceptions of moving image archives as either technological or cultural, which are highlighted through concerns such as digitisation and accessibility. Notions of a Radical Moving Image Archive as a Problematic presents archival knowledge as a co-construction of image, apparatus, maker, and viewer. The thesis proceeds from a media archaeological approach to the study of media technologies in order to elaborate an understanding of moving images as a network of technological apparatus that are historically, culturally, politically, and aesthetically contingent. As a speculative archival practice, the Mnemosyne Radical Moving Image Archive builds upon the work of art historian Aby Warburg’s approach to the Mnemosyne Atlas project, particularly through the concept of assemblage, utilising comparison and disjuncture to read the image contextually in multiple aspects. This practice is also considered in light of Jakob von Ucküll’s notion of umwelt. The Mnemosyne Radical Moving Image Archive takes images and sequences from moving image works to problematise traditional film studies categories of the moving image, as form, auteur, spectator, nation, etc., to assert other potential relations amongst the works.
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Author’s Declaration

At no time during the registration for the degree of Master of Philosophy has the author been registered for any other university award. Work submitted for this research degree at Plymouth University has not formed part of any other degree either at Plymouth University or at another establishment. Relevant academic seminars and conferences were regularly attended at which work was often presented.

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Introduction: Archiving the Un-archivable

This chapter introduces the key concerns and concepts for this thesis; it outlines the context and background for the research, as well as the methodological impetus for addressing its primary question: how can we archive the un-archivable in moving image? The chapter addresses why *Notions of a Radical Moving Image Practice as a Problematic* makes a timely contribution to knowledge concerning artistic interventions in the archive and transcends divides between conceptions of the archive that focus either on institutional frameworks or technological changes. The chapter concludes with an outline of the structure of the thesis.

The archivist and the filmmaker

Figure 1. Still from *Life in Peckham* (2009), directed by Amanda Egbe.

In and around 2008, I was commissioned to produce a moving image project that could represent a recent history with and to a local community. The project *Life in Peckham* (2009) was concerned with aspects of history in post-Second World War Southwark, London. The two-screen installation work combined archival footage, dérives, and re-enactments with a group of school students acting as participants and collaborators. Figure 1 places side by side the visit of Princess Margaret to open new flats in Peckham in 1952 alongside the re-enactment by local schoolchildren for the project. From the
outset, the project aimed to glean elements of a history beyond that which had already been written, particularly concerning narratives of ethnic communities in London, such as the Windrush\textsuperscript{1}. In turning to the archive as a resource, what became apparent was a question of how one could search for something that was not present, something outside of the official sources of information, to present or re-present an event or moment that was not already demonstrated within the archive. The concern arose out of trying to marry the present histories and lives – those of the participants – with the fragments of news footage and oral accounts of known and unknown people. The project aimed to animate present and past histories as a new document as an intervention into history making as a collaborative process. The project itself brought to the fore further questions about the role of archives and museums in framing histories, as well as artistic strategies and approaches to working with archives. Can archives claim to store everything, and is it desirous that they do so? Are artists reinstating problematic histories when they utilise archival materials?

In 2011, I worked on a large-scale digitisation project to archive the materials of the National Review of Live Arts Archive\textsuperscript{2}. The project was in its second phase and had as it main aim to preserve and make accessible its materials online and at the University of Bristol Theatre Collection. The project required transcoding and digitising hours of moving image footage from a range of formats of documentation of live art performances. Alongside the moving images, a system of metadata describing each artefact of the archive had to be produced that could encapsulate the nature of the.

\textsuperscript{1} Empire Windrush was the name of the ship that brought a large group of post-war immigrants to the UK from Britain’s colonies following the end of the Second World War. The British government had encouraged migration in order to fill labour shortages, and Empire Windrush in 1948 brought over 400 migrants from Jamaica to London. Synonymous with the ship, subsequent narratives about the people who migrated in the ‘40s, ‘50s, and ‘60s have dubbed them the “Windrush generation” and the arrival of the ship itself as the beginning of the mass migration of the Afro-Caribbean community in the UK (Mead, 2009).

\textsuperscript{2} The National Review of Live Art (NRLA) Archive consists mainly of video documentation of performances at the NRLA festival. Consisting of over 1,900 files, the audio-visual documents cover the period from 1986 to 2010. The archive is situated at the University of Bristol Theatre Collection and is also available online.
recordings. There were often multiple documents of the same performance, from different angles and at different performance times, making each an individual instance within the archive. In order to structure metadata that could account for the multiples that extended out of a single performance concept or act that could be appended into the future, the project utilised the strategies of the Variable Media Questionnaire (Ippolito, 2003) and the Media Art Notation System (Rinehart, 2007). Both the Variable Media Questionnaire and the Media Art Notation System offer approaches to preservation and documentation that move away from traditional museological approaches of categorising physical objects by recognising that some works of art (because of their ephemeral nature, technical considerations, their multiple parts or structured nature, documentary quality, and the possibility of obsolescence of the technical hardware or software used to produce and exhibit them) require a different framework for preserving them. Many elements of new and digital media, alongside performance and live art, installation, video, and expanded art works, are understood beyond the notion of them being physical objects. The idea of these media works being variable allowed for a framework to be considered that conceived of the concept of the work as similar to a musical score: whilst the hardware or instruments may change, the essential score is maintained and recognisable as the source (Rinehart, 2007: 182). In the case of the National Review of Live Art Archive, a version of the Media Art Notation System was implemented that attempted to reconcile multiple instances of a performance with multiple video documents and ephemera such as programme listings and images. The project raised questions of what is it that is being preserved: the document of a performance or the concept of that performance? How can we retrieve and then use that document or concept?
My own moving image practice has been influenced in part by the strategies of experimental film, particularly structural/materialist film. Structural/materialist approaches aimed to oppose the dominant cinema of classical Hollywood to act against the ideology that it saw as inherent in the filmmaking process that privileges narrative. My research has been posited on the notion that these types of works (structural/materialist) seem to resist the process of film archiving. Resistance here is meant as a film practice that confronts and opposes dominant modes. The problematic arises that these types of practices become embroiled in the very ideological framework they aimed to contest when placed within the context of the archive, therefore replicating the structures that they aimed to challenge. The conception of the archive or the modern museum could be argued to lean towards narrative: a disciplining environment. The work of Bennett (1995) and Pearce (1992, 1995) foregrounds the notion of the modern museum as the drive towards a homogenous experience, the presentation of given objects, and the formation of a rounded museumgoer who is to be educated and is to adhere to the civilising aspect of the museum. These aspects of the modern museum have been problematised through alternative approaches that refute the idea that museums hold to fixed continuous frameworks; rather, they manifest contradictions (Crinson, 1999). This is further problematised when we look to material culture, thinking through objects, such as in the work of Stahlgren and Stottman (2007) and Christensen (2011) in relation to their research of house museums.

Structural/materialist film strategies, alongside other avant-garde film practices (such as Brechtian cinema / political film and black, queer, or third cinema), also offer challenges with respect to the ideological framing of such works within the archive. Structuralism/materialism here, however, also poses a particular challenge to dominant

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3 ‘Structural’/‘materialist’ is a term that was used to designate the mainly UK form of structural film practice that came out of the co-op and workshop movements in the US and Europe in the '60s and '70s. The London Film-Makers’ Co-op was one such workshop that produced a number of leading exponents of structural/materialist film practice, which is discussed in more detail in Chapter Two.
cinema in its characterisation as film: that is, how a film is a document of its own making, rather than of some illusionary narrative. The notion of the document and documentation as noted above is a subject that is often linked to performance, installation, and expanded cinema. It is not surprising to note that many filmmakers linked to structural/materialist film, expanded cinema, and the artists’ film and video movement can be found documenting and exhibiting alongside performance artists in the live art context, such as the National Review of Live Art. Stephen Littman, Stephan Partridge, and Doug Aubrey, artists and filmmakers in their own right, were also responsible at different times for the documentation of the festival. My background in such artistic practices led again to the reiteration of the question as to whether these types of works and practices were un-archivable or if in fact their strategies of production were ones that could be considered as strategies for archiving.

**Digitisation, archiving, and filmmaking strategies**

The context for this thesis is to address the above concerns primarily from the view of a filmmaker and artist working with archival materials, framing the concerns of what is archivable through the perspective of moving image artistic practice. There is a background of artists’ intervention with archival materials at the level of retrospective and preservation – how artists exhibit and archive their own and others’ work. Artistic interventions with archival materials are not new, but this work has always raised questions of the role of the archive (whether institutional or personal) and has been considered in artistic practices outside of the moving image (e.g. in areas such as performance and literary studies), in such practices as re-enactments, re-stagings, and a

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4 The NRLA archive includes, for example, the work of artist Vicky Smith, who was a member of the London Film-Makers’ Co-op, but her work often includes performance, expanded cinema, and animation.

5 Additional information on the documentation of the NRLA festival can be found at the Live Art Archives at the University of Bristol Theatre Collection.
concern with documentation, as noted above. The thesis concerns itself with these implications in the changing technological landscape, where the crisis of storing and retrieving moving image works in the light of digitisation illuminates the concern for what is chosen to be archived as both artefact and cultural concern, alongside questions of whether this new artefact can be considered equivalent in its digital state. The move to digital from analogue affects not only the archival practices of large collections and archives such as the National Film and Television Archive (UK) but also small collections and artists’ own personal works and holdings. The process of film archiving, storing, and retrieving concerned with the cataloguing, preservation, conservation, restoration, and exhibition of individual films has been in crisis from its outset. The dangers of nitrate film, vinegar syndrome, and the large costs involved in storage (Houston, 1994) are amongst the many battles that the film archivist has had to contend with.

The notion of preserving a nation’s heritage focuses attention on the problem of what should be kept. The medium specificities of the film archive in this sense open up to the wider cultural and historic critiques of the entire project of archiving, collecting, and museology. The current concern with digitisation brings to the fore these same questions again, not only because of the huge costs involved (digitisation is still a largely labour-intensive process) but through other concerns. The ever-increasing number of films, videos, television programmes and other media moving image works being produced that are now available online, also become a site for interrogation and intervention. This context is driven by other concerns whereby the use and re-use of moving image works through new user-driven technological models such as database aesthetics (Vesna, 2007) points to a changing role of the viewer as user. The shift to the digital for Fossati (2009) has profound effects on the filmmaking process and the concept of film itself.
The question of artistic interventions in archival practice arises as a challenge to a series of traditional models of moving image study. Artistic interventions this thesis suggests formulate strategies for thinking about artistic practice in such a way as to alleviate the current burden on archiving moving image works as a concern for institutional organisations. The critique of archival moving image practices from artistic interventions tends towards a critique of the institution, such as Cummings and Lewandowski’s *Enthusiasts Archive* (2006), or a re-examination of what film is through its archival material, as is seen in the work of Gustav Deutsch’s *Film Ist* (1998). The notion of film history as a spatial concern can also be seen as a critique of the institution as in the case of Patrick Keiller’s *City of the Future* project (2007). Further explorations in work such as the Otolith Group’s retrospective of the work of the Black Audio Film Collective (Eshun and Sagar, 2007) highlight a response to moving image works in the archive that question facets of archival practices, namely: what is archivable? These works illustrate concerns for what it is that is being archived, in what context these materials are viewed, who is viewing these materials, and what is the relation between moving image and its history.

The works in this thesis present a meta-discourse on the nature of the archive, as well as presenting materials from it. An issue that arises through looking at these works are the way they attempt to reconstitute the archive. This reconstitution is brought about through bringing to the fore what seemed to be materials that were not part of the official archive. These examples include the *Enthusiasts Archive* (2006), the collection of amateur Super 8 film works from post-war Poland, or materials that questioned the archive in terms of issues such as race or class, the Black Audio Film Collective’s curated retrospective by the Otolith Group *The Ghost of Songs* (2007). Similarly materials that focused on some facets of film practice through its material trace in the archive, for example Deutsch’s *Film Ist* (1998), and an articulation and experience of
space through media, such as with Patrick Keiller’s *City of the Future* project (2007) also highlight this reconstitution. Keiller’s investigation is linked to the longer film shots that were consistent with early cinematic practice, which now allow for views of the landscape, cityscape, etc. in greater detail. The fixed camera and the longer exposure times allowed for long unedited shots, according to Keiller. The above works also illustrate the continued shift in practices of the moving image from the cinematic auditorium context to the gallery environment (Uroskie, 2014). These works also highlight an intervention in the exhibition of these archival materials. The exhibitions concerned themselves with the experience of the viewer as an active participant in the making of the works; they encouraged an embodied experience of both the materials and the conditions in which they were viewed. This was done in the case of Keiller’s work with an architectural, imagined landscape with large hanging projection screens. The Otolith’s curated retrospective of the Black Audio Film Collective’s work consisted of laying out the works alongside viewing equipment, from slide projectors to tape machines, and inviting the viewer to orchestrate their own engagement with the materials. The *Enthusiasts Archive*, not only an online resource, was exhibited with a reconstructed cinema space, akin to the amateur film club spaces that were the settings for the works.

The initial foray into artists’ interventions with archival moving image footage found a relationship to exhibitions that saw viewer participation, beyond the seemingly passive space of the seated cinema, as an embodied experience. The radical focus here was not so much the content but the interconnections amongst viewer, materials, and artist(s). The shift to the gallery context does not point to a break with the notion of the moving image as synonymous with cinema; rather, it poses the issue that what constitutes the moving image is an entanglement of materials, viewers, and makers bounded by the context of where, when, and how the moving image is utilised. This
therefore relates to Zielinski’s assertion that the cinema is one stop on the continuum of audio-visual technologies (Zielinski, 1999). This thesis suggests a way in which moving image practice can be thought of as moving image archival practice, challenging binary oppositions of what can or should be archived. This thesis opens up strategies for making, viewing, and storing the moving image beyond traditional models of institutional, technical, and artistic practices that appear in opposition to each other, in order to enhance our consideration of the moving image in its aspects as a technical, affective, and participatory set of media.

**Terminology**

To support the readability of this thesis, this section provides a brief contextualisation for the most commonly used terms within this document. The thesis is concerned with moving image practice, though the term **moving image** may at times be used interchangeably with film, cinema, and the audio-visual. It is necessary to point out what is meant in the choice of moving image as opposed to film. Moving image is used to denote the link not only to cinematic film practice but also to artists’ film and video, which includes television, video, computer, and expanded work. It also points to a set of mediums that are concerned with the illusion of movement that do not begin or end with cinema, such as the magic lantern or archive scanners. The use of the term also points to the primary concern of this thesis being with the visual and not audio in relation to moving image and audio-visual practice.

Alongside moving image practice, archival practice is the other central concern of this thesis. The **archive**, simply put, can be understood as a medium of storage and a form of organisation of records and documents. The archive can also be further defined as a repository and collection of artefacts (Manoff, 2004). The term has also come to be associated with the entire contents of museums, collections, and archives. Manoff notes
that the prevailing discourses concerning the concept of the archive fall into two interconnected forces:

One is the conflation of libraries, museums, and archives; and the other is the inflation of the term “archive,” which has become a kind of loose signifier for a disparate set of concepts. Many have attributed these effects to changes in information technology. (Manoff, 2004: 10)

The critiques of the archive question its benign status as merely a repository. Derrida’s Archive Fever (1996) points to how the structure of the archive determines what can be archived, as does Ernst with his assertion that archives actively define what is remembered and archivable (Farocki and Ernst, 2004). Much work has been done in feminist and postcolonial scholarship to critique the role of archives and to address the exclusions, omissions, and inaccuracies of official records (Manoff, 2004: 15). It is within this context and with this in mind that whilst the concept of the archive in its broadest sense is used to define moving image archives, that of a repository for moving image documents, this thesis problematises and interrogates this definition to present an alternative set of strategies for thinking about and utilising the archive. The notion of the un-archivable is therefore posited as a way of thinking about the archive in relation to where critiques have problematised it. These critiques, outlined partially above in the introduction, and explored throughout the thesis, extend to artistic interventions with the archive and with technological concerns such as digitisation. Approaches such as the Variable Media Questionnaire (Ippolito, 2003) and the Media Art Notation System (Rinehart, 2007) utilise archival frameworks such as metadata to alleviate the concerns over what can and cannot be archived. The thesis sees problematising and making problematic as a key strategy of expressing what moving images and archives are. This strategy extends to the notion of the radical, which is here conceived as the oppositional practices that are highlighted throughout the thesis. These oppositional
practices tend towards critiques of the dominant modes within their fields. In moving image practice, these can be articulated for example by the structural/materialist filmmakers. The structural/materialists anti-illusionist practice was in opposition to classical narrative cinema, or what Martin Walsh (1981) terms radical cinema when considering the film works that were influenced by Bertolt Brecht’s theories on theatre.

**Moving image practice and media archaeology**

The main methodological strategies utilised within this thesis build upon media archaeological approaches and new film history concerned with early cinema. A media archaeological inquiry into early cinema and moving image technologies highlights the various instruments, apparatus, and entertainments that proliferated the environments of the 19th century. This environment from which the modern museum evolved; the fairgrounds, world fairs, amusement parks, and music halls, played host to technologies such as the cinematograph, the zoetrope, and the Kinetoscope. The histories of Crary (1992), Kittler (1999), Herbert (2000), and Stafford and Terpak (2002) situate these devices within this modern period. However, this research is informed by a notion of early cinema that has problematised the technological. Reading through this network of the scientific, spiritual, and imaginary as deeply implicated dimensions of the filmic experience allows for a deeper understanding of the network of filmmaker, viewer, and (film) material. Cinema’s history in this sense refers to the scientific investigations of Marey, the practices of Athanasius Kircher (the 17th-century Jesuit who utilised the magic lantern), and, as Punt (2000) highlights, the entrepreneurship of people such as Robert Paul, alongside the public’s imagination and appetite.

Archaeology, in particular media archaeology as an approach to understanding technology and media, is used by this thesis. There is a focus on a media archaeological approach that looks at the instruments and apparatus that act as inscription technologies,
based on a reading of Kittler’s *Discourse Networks* (1990) and *Gramophone, Film, Typewriter* (1999) and in reference to a reading of Foucault’s *The Order of Things* (2011). This research is concerned with the period of modernity as outlined by Kittler and Foucault, it looks to the changing landscape of technologies that Kittler enunciates as being the discourse network of the 1800s and 1900s. Media archaeologies, as outlined by Parikka (2012), have a variety of forms: there is no single way of doing media archaeology; rather, it is a case-by-case investigation of the media under consideration. Grau’s (2003) investigation of the panorama forms a media art history that looks to “old” technologies to speak to “new” technologies, such as immersive digital art and media practices. Other media archaeologies and media art histories highlight the multitude of instruments, rather than the coming together of one singular technology, as in the work of Stafford and Terpak (2002). Albera and Tortajada (2010) highlight that thinking through those technologies, and the networks implied, must also include the imaginary. Their reading of the importance of writers such as Verne and Welles to the production of technologies, alongside Zielinski’s (2006) imaginary media research, brings together the notion of media archaeology beyond the materialism and technological determinism of some approaches that privilege the apparatus. Rather, this thesis sees media archaeology as a framework in which to understand moving image practice through its apparatus and through a wider network of technology. The understanding of that network includes the material aspects of moving image in its phases of production, distribution, exhibition, and life in the archive as having a history that includes spiritual, technological, and scientific practices, as well as those of the imaginary.

The critical new ground of this research is that it builds upon current notions of media archaeology to strategize practice-based interventions in artistic practice that utilise the moving image archive. It does so in order to gain a greater understanding of
the network that co-constitutes the experience of film through the filmmaker, the film (moving image) material, and the viewer/observer.

The methodological approach of this thesis through its critique of media archaeology brings together dialogues in the form of a reading of von Uexküll’s notion of umwelt (von Uexküll, 2010), alongside the art historical device of Warburg’s Mnemosyne Atlas project (Warburg and Rampley, 2009). These readings are used to limit and delimit the network of filmmaker, film and viewer constituted through the archaeological approach. A radical moving image archival practice is explored: Mnemosyne Radical Moving Image Archive – a methodological praxis by which moving images in the archive are problematized.

**Duplication as a radical notion of moving image relations**

The methodology reflects upon the moving image archive as an instrument and filter for understanding the moving image as an experience: that is, how it co-constitutes states of reality. In doing so, it builds bridges amongst the notions of amateur (spectator), artist (filmmaker), and archivist, seeing these positions as always present, privileged in differing contexts. In particular, it takes practices such as those of the structural/materialist filmmakers of the London Film-Makers’ Co-op as a way of framing and interrogating interventionist practices with the archive; it repositions the notion of the archive from a repository for objects of reification into an instrument of negotiating potentialities and possibilities through exposing the affective dimensions of what constitutes the image. These affective dimensions, the distinct relationships between one image and another, are produced dynamically. This thesis shows how in looking at these relationships of the (re-)producibility of the image – being next to, in front of, and intersected by other images – the moving image comes to express more than just its materiality. Rather, material, filmmaker, and viewer (all acting as a
dynamic network) produce and amplify those relationships that co-constitute the experience of the moving image. As such, in this thesis, the archive becomes an instrument in filtering through the multiple experiences that are possible but become resonant through the practice of making and viewing.

![Figure 2. A magic lantern slide (Bill Douglas collection, The Bill Douglas Cinema Museum); consecutive frames from a paper print (Library of Congress); and a flipbook (photographed at the Technische Sammlungen der Stadt Dresden).](image)

If we were to imagine one image placed in relation to another image, these first two images are placed in a consecutive relationship. In the first instance, one can imagine these images as placed within a filmstrip: images that are side by side. Imagine now again another relation of two images. In this consideration, the images are placed above and below each other: the relationship is a layered one. The examples, before even the consideration of content, are in short two image relations that are pictorial reflections on some of the earliest forms of how material was used to store and retrieve the moving image: the slides of the magic lantern, the thaumatrope, the zøetrope, and the flipbook, to name just a few. The relations of these images were side by side, double-sided, and layered, as in Figure 2.
The relationship of situatedness to each other only forms part of the nature of the moving images’ relatedness. Again, thinking of two images placed in some relation to each other, what is stored reflects another set of relations. Thinking here not of content as the mise en scène of the image but as how an image comes to be formed through the chemical processes of photography, the laying of objects on light-sensitive material (photograms), and the re-photography of an image through duplication (contact printing and optical printing), these present a particular set of relationships that require different forms of contact. The laying of material on light-sensitive material, the laying of film on film, and drawing on film directly are all relations that suggest an intimate connection. If we then consider duplication via re-photographing, these relations of contact are manifold when one considers techniques of the optical printer, which require an intermediate apparatus or action. (This is before we begin to look at such possibilities offered by video and digital technologies.) The relationship, not seemingly as intimate as direct contact, presents another relationship of indexicality, in which the variable distance between the material of storage and the medium that acts upon it provides space for other intimations (a space in which, for some, signification takes place). These relationships of image to image are also ones that implicate bodies as part of the affective dimension. Here, the image-to-image relations of the flipbook, the Mutoscope, the Kinora, and the thaumatrope are early examples; these relations offer up a small reflection on the history of the moving image – a way for this thesis to map how we can understand changes in audio-visual media technologies in the wake of research on early cinema (Elsaesser 2004).
Contribution to knowledge

This thesis is timely in its considerations of the moving image archive, as large-scale digitisation projects (such as the AHRC-funded Into the Future project of the National Review of Live Art Archive, which was addressed earlier in the introduction) continue to be funded in order to address the perceived need to preserve and make accessible moving image works for academics and the wider public. The research’s unique contribution to knowledge is in bringing together discrete bodies of knowledge into cooperation with each other to bridge the tendencies of strategies for relieving the tensions of the archive to situate themselves as either technological or cultural. The research mobilises media archaeology and new film history alongside a reading of Aby Warburg’s art historical project of the Mnemosyne Atlas. What is novel in this thesis’s approach is that it replaces Warburg’s cosmology with the biologist Jakob von Uexküll’s notion of umwelt in order to articulate the material and immaterial aspects of moving image technologies such as the optical printer. This approach allows for the formulation of the Mnemosyne Radical Moving Image Archive as a strategy of archival practice. This practice overcomes the technological and cultural divide whilst also overcoming formulations of moving image practice that lean towards a critique of either the apparatus or the image. The thesis also contributes a media archaeology of the optical printer, which acts as a model for conceptualising the archive and adds to the body of knowledge concerning moving image apparatus and technologies.
Thesis outline

The **introduction** introduces the central problem of this thesis and the background from which the research stems. This central concern of archiving the un-archivable is formed through a review of literature and artistic practices that seek to critique archival practice. **Chapter One** explores the methodological approach of this thesis through a reading of a sequence from the film *Letter from an Unknown Woman* (1948). The sequence is illustrative of the approach of the thesis and unpacks key concepts relating to moving image history and the archive. The film is used to explore writings on new film history and media archaeology stemming from writers such as Friedrich Kittler (1990, 1999), informed by the archaeology of Foucault (2002a, 2002b), to consider how moving images construct meaning. New film history has challenged the inclination towards teleological approaches to media, revisiting early cinema to open up the dominant narrative concerning cinema’s origins. Media archaeology is critiqued within this chapter, and the methodological framework is considered in light of approaches to the history of technology. The critiques of film history highlight that cinema was not an inevitable technology but rather that moving image technologies exist as a variety of apparatus and entertainments. These apparatus developed as an interaction of science, technology, and entertainment amongst scientists, entrepreneurs, and the public. The chapter highlights that whilst a media archaeological approach can begin to open up questions about what moving images are, this approach also has to overcome the tendency to separate the apparatus from the content in how meaning is made and moving images are experienced.

Through a media archaeology of the optical printer, the subsequent two chapters explore the notion of the network as a dynamic set of interactions that co-constitute the moving image experience, acknowledgement of which is central to this
thesis’s argument for strategies of moving image practice as archival practice. The optical printer acts as a model for thinking of the archive as an apparatus that expresses the material and immaterial aspects of the central practices of the archive: copying, storing, and retrieving. **Chapter Two** is concerned with the optical printer as a philosophical toy and apparatus, drawing out through a media archaeology how moving image technologies have material and immaterial aspects. This is illustrated through a concern for duplication – a core process in archival practice. The optical printer expresses multiple ways through its use of how we conceive and experience reality as materiality, immaterial, and presentness. These notions are explored through a reading of Kittler’s “mother’s mouth” (Kittler, 1990), the use of the optical printer in the London Film-Makers’ Co-op, the role of the optical printer for archivists, and the articulation of *umwelt* in the writing of von Uexküll (2010).

**Chapter Three** continues the archaeology of the optical printer, utilising the Paper Print Film Collection at the Library of Congress as an illustration of how the network of moving images is entangled within wider networks of copyright and other media, such as print. The Paper Print Collection is a collection of the earliest examples of motion picture film that were produced and exhibited in America. The examination of the paper prints explores the wider networks of law and technology that are implicated in how we constitute film history and is illustrative of how other wider networks are entangled within our understanding of the archive. The chapter concludes with an exploration of moving image practice in the film *Tom, Tom, the Piper’s Son* (1969). The chapter further elaborates how the optical printer expresses how we conceive reality as not only materiality and presentness but also through the body and as imaginary.
Chapter Four explores the strategy of assemblage as a form of archival practice and moving image practice. Aby Warburg’s Mnemosyne Atlas project (Warburg and Rampley, 2009), which attempts to map artistic gestures across antiquity and into the Renaissance, is explored in this chapter. Warburg’s project shares an intuition with Foucault and Kittler to look for discontinuities and continuities in tracing a cultural memory that he sees as being either repressed or sublimated through works of art. The chapter builds upon Warburg’s approach to the Mnemosyne Atlas to produce a similar form of assemblage, but exchanges still for moving image works. The chapter elaborates the thesis’s own conception of the Mnemosyne Radical Moving Image Archive as a way to address the problems of the archive as articulated in the introduction and throughout the thesis. In applying avant-garde moving image practice to the Mnemosyne Radical Moving Image Archive, a strategy for approaching the un-archivable is elaborated.

The final chapter, the conclusion, reflects on the outcomes of the research. Notions of a Radical Moving Image Archival Practice as a Problematic opens up considerations of the archive to future problems through its oppositional practice. The chapter postulates further considerations and future research possibilities for the Mnemosyne Radical Moving Image Archive.
Chapter One: Towards a Model of Radical Moving Image Archival Practice

In the 1948 film *Letter from an Unknown Woman* (Ophüls, 1948), the lovers Lisa and Stefan, as part of their brief courtship, are seen walking around Vienna’s famous Prater park – the location of a fairground and amusement park, as well as the site for the 1873 World Exhibition. The couple enjoy a train simulator ride as Stefan attempts to seduce Lisa. The cycle-cranked machine unfurls a series of large canvases depicting destinations across Europe: a moving panorama inviting them to share the fantasy of travel and inviting the viewer to consider the notion of moving images, as seen in Figure 3. This chapter is concerned with the methodological approach taken by this thesis in conceiving of a radical moving image archival practice as problematic. The above sequence is used to illustrate the methodological building blocks of this thesis and acts as a meta-narrative in disclosing the central problem of this thesis, which is how we can archive the un-archivable.

![Figure 3. Frame stills from *Letter from an Unknown Woman* (1948), directed by Max Ophüls.](image)

The chapter proceeds from the concern raised at the end of the introduction: that of the relation of one image to another image in the consideration of how moving images are produced. The notion of the relationship of images hints at how the moving image, in its multitude of articulations, whether in the auditorium or outside of it, was never an inevitable medium. This chapter concerns itself with what methods allow us to
consider the relationships of images, as an approach to considering how we come to make, store, and retrieve the moving image. The problematising strategy evokes not only the instability of the materiality of moving image but also the changing dynamics of artistic practice that produces it, as well as how that is received, retrieved, and viewed by a viewer.

The exploration of the sequence from *Letter from an Unknown Woman* (1948) illustrates the paradigm shift that occurred in film studies, with a reappraisal of early cinema that is now called “new film history” (Elsaesser, 1986). This shift opened up tautological approaches to what the moving image is. It is also illustrative of the main concerns of this chapter in that it seeks to relay how cinema’s history is not a narrative of ever-improving technologies awaiting the right inventors to bring about its birth: that is, the inevitability of a medium ripe for conception. Rather, new film history, with its various paths of diversion, is explored within this chapter to set out how this shift in how to do history became one basis for the set of methodological approaches termed media archaeology. This chapter critiques both Foucault’s (2002) and Kittler’s (1990, 1999) approach to archaeology in order to elaborate one of the starting points for what media archaeological methods are. In particular, the chapter elaborates on the notion of Kittler’s discourse networks (1990). Kittler’s outline of the networks of the 1800s and 1900s introduces a critique of Foucault’s theorisation of the same period of modernity, which heralded the modern museum and the birth of cinema, which is the concern of this chapter’s timeframe. Examining *Letter from an Unknown Woman* (1948) also brings to the fore the notion of subjects that Jonathan Crary attends to in his *Techniques of the Observer* (1992). The distracted lovers of the *Letters from an Unknown Woman* reflect differing aspects of the role of the viewer, changed within the discourse network of the 1800s and 1900s.
In reflecting upon the relation of one image to another, as elaborated in the introductory chapter, the focus becomes what it is to examine history, as problematised by Foucault. Specifically, the chapter looks at a history of technology, focused on the network, that constitutes how and why moving images (particularly in the form of cinema) came to be. In reflecting upon Kittler’s notion of the discourse network and the divergence of letter and image formulated in *Gramophone, Film, Typewriter* (1999), it builds upon Kittler’s conception of meaning making to problematise the conception of how images relate in a network that includes entertainment and the sciences. Moreover, the chapter reflects upon the viewer: the changed observer of Crary is considered as part of the network, which Punt (2005) articulates is central to understanding the history of technology in reflecting upon cinema, moving image technology, and archives. The chapter brings these concerns together in order to consider what methodological approaches or moves are needed to discern what moving images are, particularly in relation to the archive and how we can utilise the archive to best understand moving images.

1.1 Media archaeology and discourse networks: From text to moving images

The 1948 film *Letter from an Unknown Woman*, directed by Max Ophüls, was a box office failure on its release. The film is based on a 1922 novella from writer Stefan Zweig (Wexman and Hollinger 1986). Despite its failure at the American box office, the film is now preserved as “culturally, historically or aesthetically significant” as part of the American National Film Registry: the list set up by the United States National Film and Preservation Board to preserve in the Library of Congress a selection of well-regarded films each year (Schwartz, 1988). The story, set in Vienna at the turn of the 19th century, recounts the love and life of an unknown woman, who, following her
death, has a letter sent to a famous writer with whom she was in love. It transpires that the man has no recollection of the woman, who as a young girl was besotted with the man, who lived in the building she grew up in. His attentions never fell on her and, forced to leave the city, she returns years later to spend three nights with him, although he never recognises her as the same young girl who had lived in his building. The encounter leads to the woman having a child. Without means, she takes to raising the boy through her relationships with a series of rich men, though she still loves the writer. The child dies during an epidemic, and with the unknown woman following soon after, she has the letter of the film’s title dispatched upon her death. The film adaptation sees a number of elements changed from the originating short story. The writer becomes a musician named Stefan, their three nights together become one, the countless rich lovers she engages with change to one rich older man (Johann), and the unknown woman (played by Jane Fontaine) is named Lisa (Wexman and Hollinger, 1986). It is the encounter between Stefan and Lisa as she returns to Vienna as a young woman that is the subject of this chapter: their one night together, which begins with the walk through Prater park, as seen in Figure 4. The adaptation from text to moving image could easily be read as a form of remediation or inter- or intratextuality. Remediation (Bolter and Grusin, 2000) is a concept concerning the way in which one medium is represented in another, and this is a defining aspect of new digital media. It could be argued that the film uses the book as its source material by remediating the literary subject (that of literature book) and the female voice as sources of exploitation and refashioning for its own purposes. This would seem to be supported in Bolter’s account of remediation:

If intermediality is in general the study of the relationships of one medium or media form to others, remediation describes a particular relationship in which homage and rivalry are combined. In a remediating relationship, both newer and older forms are involved in a struggle for culture recognition. (Bolter, 2005: 13-14)
Bolter and Grusin’s concept of remediation and indeed Bolter’s definition of intermediality above could point to one way of comprehending the repurposing of Zweig’s book: the moments of intra-textual interplay of early cinematic forms within the fairground scene. Yet their account of media innovation rarely goes beyond the teleological as been critiques by Baetens (1999). Utilising Bolter and Grusin’s account would suggest that in thinking about *Letter from an Unknown Woman*’s traversing of literature, pre-cinematic, and 19th-century entertainments, the main consideration would be one that focuses on cinema’s ability to offer a better experience of reality to a baying audience who seek technological invention. However, in supplanting their genealogy for a media archaeology that articulates a concern for the history of technology, an approach can be formulated that better articulates the artistic gestures and motifs within Zweig’s book and Ophüls’ film. In articulating this methodology, what is at stake are the steps that are necessary to consider the moving image when considered at the end of its life, stored within an archive and with its subsequent retrieval. The concern points to how, with the crisis of digitisation and the desire for completeness (as articulated in the introduction in relation to the archive), a method is required that can consider the moving image beyond its conception as a single-screen auditorium experience. It also points to the moving image in relation to its prehistory and further elaborations. This form of inquiry raises open-ended questions of what Strauven calls the what, when, and where of the moving image (Strauven, 2013).
Elsaesser (1990) and Punt (2000) point to the 1978 FIAF (International Federation of Film Archives) conference in Brighton as the moment when film history diverged into what came to be called new film history. This “new historicism” related to the new archival materials that became available in combination with “new conceptual models of cultural history” (Elsaesser, 1990: 3). The FIAF conference brought together archivists and academics and led to a re-evaluation of those teleological models of the beginnings of cinema. These teleological histories often see early cinema and pre-cinematic technologies as progressive steps on the way to the finished article as we understand cinema now to be. The history of cinema in these terms can be conceived of as the medium’s early beginnings from Edison, the Lumières, and the other pioneers, who, through technological breakthroughs, saw cinema come to fruition. These breakthroughs include the ability to convey film through a mechanism to produce an illusion of movement. Other significant inventions included the projection apparatus, which allowed for a mass exhibition experience, as opposed to a one-person viewing one. These developments are seen as the early moving image inventions that could then be innovated upon. This period was followed by one of adaptation, where cinema became the entity it is today as a series of adjustments and innovations.

This history was augmented by the next wave of pioneers, who formulated and pinned down the technological apparatus in aesthetic terms, with narrative storytelling.
beginning its forwards (inevitable) march with the cinema of D. W. Griffith, who became the father of classic Hollywood storytelling. Genres, stars, and production systems became the concerns of film history and film studies, whilst the concern for the preservation and accessibility of archival materials sat with historians and archivists. However, the concern for what was becoming of the archival materials and how and what was to be preserved led to new approaches and possibilities in thinking about this material around the time of the FIAF conference (Elsaesser, 1990). This, along with research that recognised a wider environment of entertainment, such as the fairground attractions that populate the scene as Stefan and Lisa take their walk in Prater park in *Letter from an Unknown Woman* (1948), opened up new areas of research that offered alternative accounts as to how and why moving image technologies developed in the way they did. One of these included the reappraisal of early cinematic form as no longer an expression of “primitive” cinema (Gunning, 1989) that was to evolve into the classical Hollywood narrative form but rather articulated its own set of relations with a viewing audience, as discussed further in Chapter Three of this thesis. Punt notes that this turn in historical method and approach meant a different focus for the understanding of film.

Film historians and theorists are now looking at the so-called classical period (1917–1967) not as the inevitable consequence of the inherent optical and representational properties of basic film technology, but rather as the outcome of the conflicting interests of producers and exhibitors responding to social, economic and technological contingencies. In other words, they see even the most stable period of film history as a process of contending forces in a constant state of flux. (Punt, 2000: 10-11)

This shift in how to do history that marked the re-evaluation of the notions of origins in film historiography also finds its traces in media archaeology, and Parikka (2012) notes that new film history, along with the expositions of modernity by Walter Benjamin and Michel Foucault, is one of the various branches that lend inspiration to
media archaeology. For Parikka, media archaeology is “a way to investigate the new media cultures through insights from past new media” and “is also a way to analyse the regimes of memory and creative practices in media culture – both theoretical and artistic” (Parikka, 2012: 2-3). This latter consideration offers some potential for this current study of moving image archival practice. Though Parrika also highlights the intersection between new/digital technologies and analogue technologies, which pose one possible rupture that may account for certain crises of the archive, such as with digitisation, it is due to the former concern that media archaeology is most applicable for this study. Media archaeology has many different varieties and as such is not a single methodology. Both Strauven (2013) and Parikka (2012) point to media archaeological approaches, building upon the work of Michel Foucault in his works *The Order of Things: An Archaeology of the Human Sciences* (2002a) and *An Archaeology of Knowledge* (2002b) and Friedrich Kittler in works including *Discourse Networks 1800/1900* (1990). Foucault’s archaeology looks to the network of contradictory and concurrent motives or concerns that are represented within a milieu, setting, or discourse that explain why a given object of history, such as the human sciences, can occur and be sustained. The understanding and exploration of this require an archaeological method he proposed:

One must reconstitute the general system of thought whose network, in its positivity, renders an interplay of simultaneous and apparently contradictory opinions possible. It is this network that defines the conditions that make a controversy or problem possible, and that bears the historicity of knowledge. (Foucault, 2002a: 83)

Foucault’s approach, his archaeology, was to seek out the network of motivations, contradictory and concurrent, that in their interaction produced and sustained a given object, such as the human sciences. Kittler’s approach, whilst similar to Foucault’s in locating the distinct ruptures in the ordering of knowledge in successive
epochs, which could account for the discourse networks of the 1800s and 1900s (Kittler, 1990), diverged in that it supplemented the approach with an archaeology of “inscription techniques for the creation of the modern subject” (Winthrop-Young, 2011: 39). Kittler’s media theory extended Foucault’s work to consider media technologies, going beyond writing and considering technologies such as film and computers. Kittler’s critique of Foucault is that Foucault’s theory stopped at analysing archives filled with books: that is, it stopped when discourse networks were inscribed by other means, in modern storage and recording devices such as the gramophone and film (Winthrop-Young, 2011). These new storage and recording devices offer up other forms of knowledge and meaning making that also require an archaeological approach. Kittler’s discourse network is explored in more detail in Chapter Three in relation to a media archaeology of the optical printer. It is presented here to highlight how both Foucault and Kittler have influenced strategies within media archaeological approaches.

Strauven (2013) and Parikka (2012) highlight that there are a variety of models of media archaeology, highlighting different drives from the assortment of archaeological approaches. These approaches attempt to alleviate the tendencies towards teleological media histories and to open up the problems of diverse media forms. Zielinski’s media archaeology sees media history as an activity; in excavating the past, there is no linear narrative of history as a progression from simple to complex media forms. Zielinski’s approach is an inquiry into deep history, noting that there are missed paths, that developments occur unevenly, and that what we see now is not the logical outcome of what was possible or available. Rather, his approach notes that instead of “looking for obligatory trends, master media, or imperative vanishing points, one should be able to discover individual variations” (Zielinski, 2006: 7). Zielinski’s approach sees the individual cases of archaeological study forming a “variantology of the media”, rather than one distinct overarching media history (Zielinski, 2006: 7).
Where Zielinski sees variantologies as an approach of multiple media case studies, Erkki Huhtamo’s media archaeology sees topoi. These topoi are recurring cyclical motifs or effects in media histories that repeat over periods of time and can be seen, for example, in how artists use and re-use certain motifs in their work. Wolfgang Ernst’s approach sees media archaeology in its mathematical dimension, “using the (Peircian) diagram as its epistemological tool” (Strauven, 2013: 67).

What becomes useful in applying media archaeological approaches, especially concerning early cinema, is that they bring to the fore the notion of the moving image as a set of parallels of the different accounts of what moving images are – the what could have been to the what is. It is a repositioning of films’ historiography to speak of the ontologies rather than ontology of the moving image and a way to more fully account for the changes that have occurred and are occurring in moving image practice and scholarship.

Returning to Max Ophüls’ *Letter from an Unknown Woman* (1948), the couple’s train simulator ride brings to the fore an important site of contestation between two models of doing film history. At the end of Stefan and Lisa’s train ride, Stefan returns to the ticket office booth to ask which other locations are possible for the couple to experience. On hearing that the couple had exhausted the ride’s attractions, Stefan opts to buy another ticket and enjoy the ride again, remarking that they will “revisit the scenes of our youth” (Ophüls, 1948). This revisiting also reflects the turn of some film studies scholars to look again at early cinema in its own terms to see whether the existing picture of film history could stand up. What the recovery of early cinema allowed, as stated by Elsaesser (1990, 2004) Strauven (2013) and Parrika (2012), is that the singular ontology of film as that teleological moment of technological invention that saw the birth of cinema is far from fact. Far from the history of the moving image being a linear history of seamless improvements, what was found through the recovery of
early cinema was the disjuncture of the moving image’s own history, proving against the grain that cinema was neither inevitable nor seamless in its iteration: a notion that is explored further throughout the chapter.

1.2 Techniques of the observer

One of the most pertinent questions of early cinema has been, as Strauven (2013) points out is: when is cinema? As Lisa and Stefan during their brief night together drift through Prater park, the location of Vienna’s 1873 World Exhibition and an amusement park, their choices of amusements and attractions are plenty. The scene depicts the wealth of entertainments that fought for popular attention in the amusement parks, music halls, and theatres of the 19th century. These included spectacles such as Hale’s Tours; dioramas; phantasmagoria shows, which employed multiple projections to create a multitude of effects; and Pepper’s ghost, which used plate glass, lighting effects, and projections to make objects seem to appear and disappear before the eyes of the audience (Altick, 1978). Optical illusions and effects became part of the mass public entertainment realm. These illusions were created in an atmosphere of exchange that encompassed both scientific interrogation and popular entertainment (Crary, 1992). The new cinematic apparatus, such as Mutoscopes and the cinematograph, were also appealing for the attention of a distracted audience such as Lisa and Stefan, who as they promenade along the boardwalks, amusement parks, and music halls have a plethora of entertainments to choose from.

The moving image in this distracted setting is amongst a range of different entertainments that pawed for audience attention. Therefore, what is suggested here is to see the moving image beyond its rendering as cinema and film: that is, not as a separate entity of image making but rather in its relation to other forms of making and presenting moving images. In revealing what other possibilities and potentialities were available,
we can begin to return to seeing the moving image as the notion of the relation of images suggested in the introduction. That notion does not see cinema, the sequential movement of images pulled through a mechanism that projects to a large audience, as the only form of moving image but one possibility amongst many, which also expresses the concurrent possibilities and potentialities of flipbooks, Mutoscopes, and dioramas, for example. We can consider this notion further informed by an archaeology that, in Zielinski’s terms, slices through the layers of moving image deep history to find a variable plethora of technologies. These technologies, according to Crary (1992), offer an insight into a rupture in vision that produced a changed observer, who through these technologies was being disciplined to move from a static vision to one that was more mobile and in keeping with a rapidly changing cultural environment. This notion of the observer is explored in more detail in Chapter Three, but here it is important to note that it points to the distinct ruptures that Kittler (1990) also addresses when acknowledging the difference between the discourse networks of the 1800s and 1900s.

1.3 Precursors and early cinematic apparatus: The moving panorama, cinema-goers, and distraction

If we continue to consider Lisa and Stefan as they enjoy their train simulator ride, as seen in Figure 5, what this apparatus employs are the technologies of the earlier panorama and Hale’s Tours. The apparatus and entertainment therein can be understood by bringing them into a relationship with the large-scale panorama, which was designated and patented by Robert Barker in 1787, but also other media, such as cycloramas, dioramas, and Hale’s Tours. By approaching this entertainment with a media archaeological method, we can relegate those approaches that see it as a precursor to the cinema that is the perfecting of the technology until the inevitability of
the moving image as a screen-based medium. The moving panorama / train simulator assemblage exposes a number of techniques and desires that Crary and Kittler point to in their theories, illustrating the variety of effects that can be attributed to a network of moving images, rather than a singular linear history of the moving image that only considers film.

The use of this approach with moving image apparatus is that it proposes research into a wider network of potentialities and possibilities that give impetus and inspiration to these apparatus, whether they persist or become in effect obsolete or dead media. Dead media was a project proposed by writer Bruce Sterling in 1995 to compile a list of communications media that had perished or had been forgotten as an antidote to the over-hyped claims about new technologies, such as the Internet and CD-ROMs. The project attempted to broaden the history of media technologies and our experience of them (Sterling, 2008). The panorama from which the moving panorama takes its name was a large-scale image on canvas, meticulously painted. It was placed in large rotundas where visitors could stand, usually from a central viewing platform, in order to look upon views of distant locations or battle scenes from recent history.

Figure 5. The moving panorama and the conductor in *Letter from an Unknown Woman* (1948), directed by Max Ophüls.

On 17 June 1787, Robert Barker patented a process under the name of “la nature a coup d’œil”, where a panoramic view could be depicted on a completely circular canvas in correct perspective. Using empirical methods, he developed a system of
curves on the concave surface of a picture so that the landscape, when viewed from a central platform at a certain elevation, appeared to be true and undistorted. The application of this invention became known a few years later under the neologism “panorama” (Grau, 2003: 56). For Grau, the panorama emerges from a history of painting that is distinct for its mimetic and illusionistic elements (Grau, 2003). The frescoes of the late Roman Republic exemplify the qualities that are key to Grau’s prehistory of the panorama: painting techniques that give the impression of extending space – rooms would seem larger and the compositions were natural but not occurring in nature (Grau, 2003). Stephan Oettermann’s account of the panorama, whilst highlighting what he sees as a complete break with the previous history of painting, sees elements of the baroque ceiling fresco as a forerunner of the panorama:

...eyes once piously raised to contemplate the heavenly hosts have now dropped to size up the economic potential of the surrounding environment. (Oettermann, 1997: 25)

Both Grau (2003) and Oettermann (1997) highlight the importance of the discovery and mastery of artificial perspective in changing painting from a system of symbolic reference to a new perception based on mathematical form: a new dimension of spatial depth. The elements that Grau articulates as the qualities of the panorama and its precursors (the fusing of the imaginary with the real, the creation of an artificial space, and the exclusion of the outside world) are the essential properties in characterising immersion, according to Grau (2003). The panorama evolves out of a merging of the real and unreal space: a spectacular 360-degree landscape painting, which, unlike frescoes or friezes, has no framing elements, nor does it rely upon architectural elements – it relies upon spatial depth. The spectacle emerges firstly as an illusory space. This stems from an immersion within a total world, shut off from outside distractions. There is little to break the viewer’s concentration and injure the illusion.
The type of immersion that has been attributed to the panorama and its effects on its audiences highlights its transformative effects on perception both as a product and as an informer of it. Oettermann’s (1997) accounts of the discovery of the horizon and of artificial perspective suggest that the development of the panorama is not just a matter of its precursors but also tells us something about human desire. Oettermann explains that artists, Goethe amongst them, would find themselves giddy from the experiences of seeking out and experiencing the horizon, clambering up towers and viewing platforms. The limits of the human body’s endurance that manifest themselves in sensations of giddiness were in part limitations of human vision, and the notion that these limits should be challenged and overcome was prevalent, Oettermann claims (1997). What seems unique is the comprehensiveness of the effect of the panorama: it produced imagined and real worlds to those who could not or would not travel to them in reality; it brought the technique of artificial perspective in all its glory to thousands and thousands of viewers, conjuring up the similarity of experience and overwhelming the spectator. The illusionistic effect of the panorama produced diverging responses to it as a medium, with some seeing it as dangerous to consciousness and perception whilst others saw it as an ideal space for projecting their visions of the world (Grau, 2003). The panorama could be instructive not only in its shaping of human perception but also in its recounting of history. The panorama gained huge audiences for its views of city landscapes, allowing audiences to see the world without having to travel, and the battle scenes became an important form of shaping political and military history. Grau’s account of the panorama of the Battle of Sedan shows that the panorama could be used as a tool for propaganda, with the Kaiser announcing that the piece not only fostered understanding of the war in the places where it was shown but was a “living memory” (Grau, 2003: 92). The link between war and media technologies is discussed further in Chapter Four, but here it highlights the propaganda aspects of that entanglement.
Grau’s account of the panorama suggests its value is only in its foreshadowing of new media technologies and techniques of immersion. His history suggests another teleological account: a stepping stone to the world of new media. However, what can also be drawn out here is the rupture that occurs in vision and is noted by Crary (1992) and Kittler (1999) that is the observer as an inscription subject, as well as the entanglement of notions of the real and the illusionary, which are picked up further in Chapters Three and Four on the media archaeology of the optical printer. If the panorama was one line of departure for the train simulator / moving panorama ride, then Hale’s Tours was another. Hale’s Tours were a chain of moving image theatres that would show non-narrative film, usually shot through a train window and depicting “scenes of the world” with pictures that had been “taken from the front end of a train in motion” (Brown, 1916: 372). The theatre was arranged like a Pullman train car, with a train conductor and sound effects to augment the experience. Gunning highlights that the presentation had more to do with fairground attractions and the entertainment milieu of the time of amusement parks, which was a necessary consideration for the entrepreneurs hoping to gain audiences, more so than the notion of film having its traditions in “legitimate theater” (Gunning, 1986: 65).

The environment of the amusement parks, Punt (2000) points out, allowed for distraction and instruction to exist as a singular experience, with the amusement parks alluding to and directly designed based on world fairs. The movement of world fairs of the 19th century was mainly focused on trade: they were large-scale expositions of industrial and technological inventions and innovations. Punt (2000) highlights that public demonstrations of new inventions flourished alongside the increase in popular scientific journals. Nasaw also points to how popular the amusement strips were within the world fairs in the US, soon becoming the central attracting feature (Nasaw, 1999). The intermingling of science, entertainment, and technology is examined in Punt’s
Early Cinema and the Technological Imaginary, but what the above illustration of Stefan and Lisa’s encounter in Prater park recognises is that these two were like many audiences: fair-goers and amusement-park-goers who were familiar with an environment of scientific exploration and instruction, entertainment, and amusement. These audiences saw scientists, entrepreneurs, engineers, and producers vying for their attention, who were equally engaged in directing the flow of what technologies were to gain ascendancy amongst a plethora of possibilities.

Media archaeological approaches highlight the multitude of instruments, rather than the coming together of one singular technology, as in the work of Stafford and Terpak (2002). Albera and Tortajada (2010) highlight that thinking through those technologies, and the networks implied, must also include the imaginary. They write on the importance of fantasy and science-fiction writers such as Verne and Welles to the production of technologies. Their notion of the imaginary alongside Zielinski’s imaginary media research, brings together the notion of media archaeology beyond the materialism and technological determinism of some approaches that privilege the apparatus. Rather, this research sees media archaeology as a framework in which to understand moving image practice through its apparatus and within a wider network. That network includes understanding the apparatus that constitute moving image in its production, distribution, exhibition, and life in the archive as having a history that includes technological and scientific practices, as well as the imaginary. This imaginary aspect, as in the work of Punt (2000), sees cinema as being co-constituted in a network of entrepreneurs, scientists, inventors, and the public. The concept of the imaginary here also helps to highlight that an understanding of these technologies can also be read with regard to the possible directions, imaginary solutions, and responses to these technologies.
In articulating a media archaeological approach, particularly in relation to the moving image, it is necessary to consider the role of history within our media archaeologies, as suggested by Gitelman:

If history is a term that means both what happened in the past and the varied practices of representing that past, then media are historical at several different levels. First, media are themselves denizens of the past. Even the newest new media today come from somewhere, whether that somewhere gets described broadly as a matter of supervening social necessity, or narrowly in reference to some proverbial drawing board and a round or two of beta testing. But media are also historical because they are functionally integral to a sense of pastness. Not only do people regularly learn about the past by means of media representations – books, films, and so on – using media also involves implicit encounters with the past that produced the representations in question. (Gitelman, 2006: 5)

This notion is taken further in Punt’s concern for an integration of the history of technology and the history of the image in relation to film. That is to overcome the discontinuity that occurs between the “cinematic imagination as hardware and the cinematic imagination as software” (Punt, 2005: 49). When conceiving of a framework for approaching moving images, it is necessary to consider whether a media archaeological approach therefore takes account of this discontinuity, as Punt terms it, between the software and hardware of the moving image – between the effects of the image and the technologies that produce the illusion of movement. The concern suggests that the dichotomy between what should be stored and how it is stored needs to be overcome in any approach to the archive.

1.4 A return to the scenes of our youth

So, in returning to Letter from an Unknown Woman (1948) and Stefan and Lisa’s walk through Prater park, utilising a media archaeological approach as outlined above, augmented with a concern for a history of technology that overcomes the discontinuity of image and apparatus, we can read the sequence thus. Stefan, now transformed into a
musician rather than the writer in the book, would, according to Kittler, suggest the rupture between the discourse networks of the 1800s and 1900s. The mother’s mouth form of knowledge production and meaning making has language learning entrusted to mothers to produce children who can speak and read through the new system of alphabetisation. With the 1900s, the new technologies of the typewriter and film reduced language to signifiers, with those effects of writing being technically reproducible as sound and image through the gramophone and cinema. Stefan’s new occupation of musician in the film as opposed to the writer in the book denotes this rupture between the discourse networks. The amusements and entertainments that they pass as they take their train simulator / moving panorama ride, including the large Ferris wheel seen in Figure 4, which stands at the entrance to the park, speaks to this changed environment. The sequence with the train ride has no equal in the novella, and it represents Ophüls’ critique of the filmmaking process and the discernable differences between how film produces effects as opposed to those produced by literature. The sequence goes beyond a mere intertextual expansion of the narrative by other means; rather, it contributes a small archaeology of moving image technologies and the interweaving concerns of amusements and fairgrounds, which were the environment for the development of film. This development can be seen, as Punt (2000) notes, as an environment where audiences, entrepreneurs, and engineers coproduced the technologies of science and entertainment – a reflection upon the technological imaginary. As presented above, when we consider Zielinski’s slicing through a layer of deep history to look at the manifold possibilities of the variety of technologies that were available in conceiving of moving images, this points to a wider set of possibilities and potentialities, marking alternative routes and dead ends. The train simulator conductor sits atop a bike that produces the necessary effort to produce the motion of the moving

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6 The mother’s mouth is a notion that I will return to in Chapter Three as part of a media archaeology of the optical printer.
panorama, all within an amusement park that also mimics such entertainment as Hale’s Tours. These were the technologies that did not take hold, pointing to alternative paths. These form part of the wider network of moving images and the effects produced, suggested by Ophüls in his consideration of place, and the evoking of the illusion of movement. This evocation is not just mechanical or technological but a coproduction of the public’s imagination, portrayed in the film as the imaginations of Stefan and Lisa. Whilst the mechanical effort is outside the carriage, within it Lisa reminisces about her past. This picture can be said to represent the dichotomy of the archive in its dualistic concerns for memory and technology as a repository and an articulation of human desires.

The carriage can be seen to represent the archive as a black box. As Stefan returns to the ticket saleswoman (Figure 6), he is told that they have exhausted the views that are available. Stefan, wanting to entertain Lisa further, pays for another round, responding “let us return to the scenes of our youth” (Ophüls, 1948).

Figure 6. Stefan with the ticket saleswoman in Letter from an Unknown Woman (1948), directed by Max Ophüls.

The audience is left to imagine what occurs behind the closed doors of the carriage as the lovers replay those scenes of their youth. The scene expresses the desirous nature of the moving image archive, both in the anxiety to store all and in the inclination to replay
moments. What is expressed in the facets of the mechanical and technological in the scene, where the conductor peddles in order to facilitate the motion of the moving images, is the raft of possibilities that were taken up as both science and entertainment in producing moving images. These possibilities also constructed subjects structured within the discourse network of the 1900s. It also points to the facets of material and immaterial aspects of memory and meaning making that are presented in Lisa’s fantasies and memories. The two aspects seem separated as inside and outside, but beyond a directorial device by Ophüls, this presents the challenge of this thesis to transcend the dichotomy, to see continuity where discontinuity seems pervasive in how we approach moving image archival practice.

In outlining media archaeology as a framework for considering the concern posed in this thesis, this chapter has tried to consider an approach that could speak to the dichotomies elaborated in the introductory chapter. The thesis is concerned with attempting to alleviate a perceived burden on moving image archives to store and retrieve all that has been produced, where solutions have tended towards the technological or cultural. What the chapter has suggested through the illustration of the sequence from *Letter from an Unknown Woman* (1948) is that media archaeology can begin to situate the moving image within a wider network of technologies. This concept of the moving image expresses possible missed paths, potentialities, and imaginaries. However any approach, including a media archaeological one, must also be able to overcome this discontinuity between image and apparatus. The following chapters elaborate a media archaeological approach to the moving image archive, firstly by presenting the optical printer as a model for conceptualising what the moving image archive is. The thesis then proceeds to overcome this discontinuity of software and hardware by augmenting this archaeology with a strategy of assemblage, building upon the work of art historian Aby Warburg.
Chapter Two: The (Im)material Aspects of Film Duplication: The Optical Printer as a Philosophical Apparatus

Introduction

The next two chapters sketch a media archaeology of the optical printer in order to present a model for thinking of the archive as an instrument or apparatus, such as the optical toys and instruments that were considered part of the 19th-century environment that Crary presents in his *Techniques of the Observer* (1992). This media archaeological approach is in light of the previous chapter’s critique of how we can think about media technologies and practices as situated within a wider contingent network of history, technology, politics, and culture. It is also in light of the varieties of media archaeologies noted previously and this thesis’s approach to supplement media archaeology with a history of technology, which seeks to problematise our media use. That is, this thesis is concerned with how we experience moving images, postulated here as being co-constituted by the material, maker, and viewer in the context of Western meaning-making practices of the last 200 years. The thesis is concerned with the period articulated by Kittler’s *Gramophone, Film, Typewriter* (1999).

The optical printer is explored as a means by which the arrangements of the moving image (that is, the various assemblages of technology and its cultural, imaginary, and technical aspects) help us to think through the possible problems of its use, such as how to archive moving images. This notion is further explored within these two chapters as a concern for how the optical printer is implicated in aspects of preservation, duplication, and retrieval: that is, the processes of copying, storing, and recovery. The optical printer is analysed to open up certain ideas and approaches as to how moving image practice produces meaning. The chapters present two key notions of Kittler’s “mother’s mouth” (Kittler, 1990) and von Uexküll’s *umwelt* (2010). The first is
problematised to build upon the notion of meaning being produced as minimal signifieds, including human agency. This is done with recourse to the second notion of *umwelt*, whereby the immaterial aspects of duplication within the optical printer can be conceived of as part of a wider network. Duplication is presented through the optical printer as a way in which the use of the minimal signifieds considered in Kittler is understood to be how the optical printer expresses time and space. The optical printer makes its appearance as a tool of special effects within dominant filmmaking practices, as well as an instrument of preservation for the archivist. This, along with the use of the optical printer within experimental practices, is a key step in articulating why the optical printer acts as a model for the moving image archive. It is the way in which the optical printer is able to operate in multiple realms. These include the realms of the illusionistic and imaginary (narrative film), the realm of anti-illusion (avant-garde film), and as fact and document (archival film practice). These articulations point to how the archive can be utilised to present material and immaterial aspects of the moving image. The case of the Paper Print Collection, the archival documents of early American film history, further highlights these entangled expressions of how the optical printer can be seen as a model of the archive. The avant-garde practices, the duplication of material, and the optical examination of that material implicate the body and notions of perception within the process of meaning making. This is explored through avant-garde moving image practices, working with archival material, and expressing notions beyond those of the structural/materialist notion of presentness.

These chapters present a model of the optical printer to allow the reader to consider how we move away from technological determinist models that relegate human agency with the move to optical technologies towards a model that incorporates the technology (material) and the viewer/user as co-constitutors of experiences with moving image technologies. That is, when we consider the optical printer as a
philosophical instrument, it is like a spider’s web that produces an environment that comprises a perception of a world seen and unseen. It constitutes our lived perception as we act, our presentness, our environments, and the imaginary. We can begin to understand the modes of copying, storing, and retrieving within the optical printer as a model for apprehending the archive.

2.1 Duplication and moving images

![Figure 7. Frames from the 1896 film The Burning Stable (images from the Library of Congress).](image1)

The 1896 film *The Burning Stable*, seen in Figure 7, is one of the early motion picture examples that survives in the archives at the Library of Congress and is attributed to the Edison film company. The film, barely one minute in length, depicts the rescue of four horses and a cart from a burning stable by firefighters. The film is an actuality, which is the name given to the genre of films that recorded actual events: they were short non-fiction pieces of film of events, things, or places. *Berlin Horse* (1970), seen in Figure 8, is a nine-minute experimental film created by the filmmaker Malcolm Le Grice, which

![Figure 8. Stills from Berlin Horse (1970) by Malcolm Le Grice (images from Lux.org).](image2)
duplicates elements of *The Burning Stable* (1896) film alongside additional film recorded by Le Grice of running horses. Both films are subjected to a process of being re-photographed with the use of filters, superimposition, speeding up, slowing down, and viewing the film at different angles. *The Burning Stable* also exists as a Kinora reel: an early moving image device that was designed by the Lumière brothers. The Kinora was a form of domestic Mutoscope. The mechanism worked more like a flipbook than a film projector, where the users could view the consecutive frames of the photographic prints through a small viewfinder. By turning the handle with enough or as little force as necessary to control the images as they flicked through the device, the illusion of moving images was obtained. The Kinora was an apparatus devised for the home, not viewable by more than one or two people at a time. By re-photographing the popular motion picture reels that were available in the public arena in a smaller format for use in the private arena, another purpose could be found for a medium that was still to find its standardised form. Duplication, whether in the form of avant-garde practice that seeks to critique the notion of the “real”, the commercialisation and dissemination of an early form into multiple media, or the process of copying prints in order to preserve and restore them for the archive, has been a central part of the making of moving images.

This chapter explores the history of duplication through a media archaeology of the optical printer to consider the wider notions of the immaterial and material aspects of moving image duplication. The chapter does this by considering what an optical printer is, firstly from its inception as an out-of-camera instrument for special effects and as a duplication instrument, with its history, not unlike that of many moving image technologies, being linked to war. The chapter further explores the relationship with avant-garde film practice, in particular the role of the optical printer within the London Film-Makers’ Co-op of the ’70s and the role of the printer within archival film practice. The use of the optical printer is theorised with recourse to Kittler’s notions of discourse.
network and the “mother’s mouth” (1990) and Crary’s “observer” (2001). These approaches contextualise the ways in which meaning making and the spectator were structured through the techniques and technologies of the 19th century. The chapter concludes with a notion of what the immaterial is in relation to moving image practice. The immaterial aspects of the optical printer are expressed through a reading of von Uexküll’s (2010) thought experiment utilising a spider’s web and building upon his notion of *umwelt*.

### 2.2 The optical printer

This section of the chapter asks: how do you duplicate moving images? The film industry devised two types of machines for the process by which moving images could be duplicated: contact printers and optical printers, as illustrated in Figure 9.

![Figure 9. Roscoe C. Hubbard’s skeleton layout of contact and optical printers (Transactions of the Society of Motion Picture Engineers, Vol. X, Number 28, 1926).](image-url)

A contact printer is a system whereby the positive and negative films are held in close physical contact whilst printing to produce a duplicate of the film. With a contact printer, the film’s emulsion surfaces are in contact with each other at the moment of exposure. An optical printer is any printing machine that uses an optical system intervening between positive and negative. The intervening or interposing optical
system of printing is the concern of this chapter, with its development and use posing as a model for thinking through the paradigms of the copying, duplication, and restoration of the moving image and its archive.

The optical printer, a device used to re-film a photographic image frame by frame, could be found in the studios of the London Film-Makers’ Co-op of the 1960s and 1970s, in most major movie studios’ special-effects departments, and in the film archivist’s lab.

Figure 10. Image of an Acme-Dunn optical printer.

The optical printer (Figure 10) is a combination of projector and camera, in which the printer can pull a film, frame by frame, through its mechanism in order to re-photograph it onto a new roll of unprocessed film. Utilised in this sense to produce a duplicate of the film, it also offers a wider catalogue of reproduction possibilities through its adjustable properties. These properties, such as the ability to enlarge and reduce details within the frame and to produce dissolves, fades, and many other effects that were previously separate in-camera processes. The in-camera effects, such as superimpositions, mattes and substitution shots, formed a fundamental aspect of the
early history of the cinematic apparatus, from Edison’s studio films such as the *Great Train Robbery* (1903) to the trick shots employed in the films of Georges Méliès (Okun and Zwerman, 2012). The in-camera effects were already developed within photography but offered new possibilities with the development of motion picture technologies.

Méliès was an illusionist with his own theatre before he realised the potential of the new moving image technology. Like many other entrepreneurs of the time, he was part producer, inventor, and salesman (Zielinski, 1999). Failing to get his hands on the Lumières’ cinematograph, he was able to utilise Robert Paul’s Theatrograph (Punt, 2000: 82) to use his talent in one area to supplement another. Méliès understood the theatrical and fantastical potentialities of the moving image, producing illusionistic cinema dissimilar to the actuality film being produced elsewhere. Méliès’ approach was to combine the premise of his stage shows with the possibilities afforded by the moving image. He innovated a number of trick and special effects with the technology, which were to become the signature of his cinema. Films such as *Un Homme de Têtes* (1898) utilised superimposition, whereby he superimposed images of his own head so as to appear in one sequence to be singing with himself (Figure 11). The effect was achieved by obscuring part of the image to be recorded with a matte during the first exposure and then during additional exposures using a counter-matte to prevent the camera recording certain parts of a set or scene (Fielding, 1985).
These effects and illusions, which are implicated in the in-camera and early visual effects of the optical printer, belie the wealth of instruments and apparatus that fought for popular attention in the world fairs, music halls, and theatres of the nineteenth century. There were shows such as the phantasmagoria which employed multiple projections to create a multitude of special effects (Altick, 1978). Similarly, the Pepper’s ghost effect of the 1860s used plate glass, lighting effects, and projections to make objects seem to appear and disappear before the eyes of the audience. These types of illusions were created in an atmosphere of exchange that encompassed both scientific interrogation and popular entertainment (Punt, 2000). Crary’s account of the thaumatrope, which highlighted the phenomenon of the afterimage through spinning discs with complementary images, reveals how the device served the domains of both science and entertainment. The phenomenon of the afterimage had been observed previously, but Dr John Paris’s thaumatrope was the first time it had been given a “scientific explanation”; it led to the device being produced for popular consumption as a “philosophical toy” (1992: 105-106). The notion of illusion implicit in these manifestations of popular entertainment finds resonance in the optical printer.

The optical printer was to become the home to out-of-camera special effects. The possibilities were realised by the cinematographer Carl Gregory when he came
upon a printer designed by a Mr G. J. Badgley of New York, as seen in Figure 12. This could be used to produce copies of standard film to domestic-size film stock. As with the example of the Kinora, motion pictures were being repurposed for flipbooks and domestic projection devices. Gregory recognised the printer’s usefulness to news productions and for the possibility of producing special effects.

Such a machine made with both heads for standard size film might be used to great advantage for trick work or for changing the frame line on ordinary standard size film. The news weeklies which use films from many different cameras of different frame line would find such an apparatus particularly valuable because the frame line of the negative would not make any difference as to its location upon the positive, a slight change in the adjustment of the printing head being all that is necessary to shift the frame line to any desired position. (Gregory, 1918: 1660)

Figure 12. Mr G. J. Badgley’s optical printer (The Moving Picture World, 1918).

Badgley, it transpires, was also developing a moving image camera for taking pictures from planes, which would be useful not only to the entertainment industry but also to the military. Gregory did not develop his own optical printer for “trick work” until 1928. The optical printer designed by Gregory and built by Fred A. Barber had listed at least 16 different things that could be done with it. These included duplicating standard and non-standard negatives, slowing down and speeding up action, and reversing and repeating events, as well as creating fades, superimposition, and multiple exposures. The “ingenuity of the operator and the film material which he has available
for reproducing ideas” were the only limitations on the things that the printer could do (Gregory, 1928: 425). Most optical printers were bespoke creations, built by camera operators, visual-effects specialists, and cinematographers in film studios, who were required to create special effects as and when a production demanded. Gregory’s hope was to make a machine for the public. Whilst the first commercially available optical printer preceded Gregory’s creation, the 1927 Depue & Vance daylight optical printer’s purpose was to reduce standard prints to 16mm. The daylight element of the printer allowed for operation without recourse to a darkroom, other than to load the positive film magazine (Depue, 1927).

The optical printer became a standardised instrument, made available to the film industry as a whole with the onset of war. Linwood G. Dunn, a cameraman and special-effects specialist at RKO, created the Acme-Dunn optical printer, with Cecil Love, for the United States Armed Forces Photographic Units in 1943 (Dunn, 2013). It was the first printer designed for mass production and was used as part of the American war effort, highlighting the connection between war and moving image technologies. The coproduction of technologies for war and cinema is discussed most notably by Virilio (1997) and Kittler (1999). McGee points to the importance of motion pictures in modern warfare, for its use in “reconnaissance, news values on our home front, and audio-visual training education” (McGee, 1944: 103). The motion picture units trained cameramen to film during combat for tactical purposes and latterly as news footage. The necessity for high-quality photographic equipment led to numerous advancements in techniques and equipment during the war years, some of which were only available in its aftermath but were considered an integral part of the war effort.

There are occasions when planes fly purely on reconnaissance missions, and for them it is the bringing back of good films that counts most. The development of multiple camera mounts, and the types of ships these are used in, are military secrets. Let it suffice to say that the camera’s action is exceedingly fast to
coincide with the speed of the ship in which it is mounted. Such a camera and plane were used by our Air Forces to bring back movies of a sunken Japanese vessel in the waters off Guadalcanal. The plane zoomed in, the pilot pressed the button and the cameras whirred. (McGee, 1944: 106).

Dunn had been asked by Eastman Kodak, which was dealing with many of the technical installations of moving image technology for the US government, to offer a solution to the problem of providing optical printers to the photographic unit. As optical printers were bespoke items, the printers could not be procured as easily as commercial items could. Dunn was commissioned to produce a standardised machine for the units, to provide for all their optical effect needs (Dunn, 1944, 1981). Given free rein by the government, Dunn worked with the Acme Tool and Manufacturing Company to produce a high-specification model. Besides doing the usual complement of optical effects, the printer could:

…make automatically driven dolly or zoom shots at any practical speed; make horizontal or vertical frame slide-off effects; wipe off in any direction at any speed; do any frame-combination printing within a 12-frame cycle; and enlarge from 16-mm, including successive 3-color separation negatives. (Dunn, 1944: 206)

With the end of the war, the Acme-Dunn printer became the industry standard used by studios and the burgeoning independent new special-effects industry that was developing. The optical printer became a staple of the industry, used for a plethora of effects: the travelling matte, blow-ups, reductions, anamorphic conversions, modifying and salvaging film, transitional effects, change of size, change of position, frame-sequence modification, optical zoom, superimposition, split screen, quality manipulation, and adding motion (Dunn, 2013). The optical printer in Hollywood became synonymous with some of the most notable developments in cinematography and special effects, including its use in *Citizen Kane* (1941) and *Star Wars* (1977). The Acme-Dunn printer led to the development of many more machines that used its design
as the basic principle for their own, such as the optical printer created by Oxberry, which in 1957, mirroring the innovative curiosity of Mr G. J. Badgley, introduced the first aerial image optical printer.

2.3 The optical printer and experimental film

In the US, filmmakers such as the Whitney brothers (James and John) were customising optical printers for their own experiments in abstract film art to produce “controllable graphic images by a method other than hand animation” (Becker, 1945: 95). After the Second World War, in the late ’50s, John Whitney was using an M-5 Antiaircraft Gun Director for his first mechanical analogue computer, built for his own motion graphics company (Youngblood, 1970). As with Dunn, the war proved useful for developing moving image technologies and innovations. The optical printer, standardised during the war, like much photographic and moving image technology, became surplus equipment post-war. Avant-garde and experimental filmmakers in the US and across Europe were utilising the moving image technologies that now proliferated on the second-hand market, aiding the underground movement of film co-ops, amateur groups, and individual artists in the 1950s and 1960s as they set up their own facilities. These workshops were able to utilise this surplus equipment in order to build their own bespoke optical printers and furnish their stores of equipment for the benefit of their members (Rees, 1999: 57).

The London Film-Makers’ Co-op, set up in 1966, was one such organisation. It was founded according to the principle of producing and screening the work of its members on a collective basis, and it was out of this that the structural/materialist movement grew. This movement, as defined by Gidal (1976), was formed in direct opposition to the dominant practices of cinema that attempted to make their ideological
framework invisible and disguise the conception of reality they conveyed through narrative codes that reinforced the capitalist mode of production:

Narrative is an illusionistic procedure, manipulatory, mystificatory, repressive. The repression is that of space, the distance between the viewer and the object, a repression of real space in favour of the illusionist space. The repression is, equally importantly, of the in-film spaces, those perfectly constructed continuities. The repression is also that of time. The implied lengths of time suffer compressions formed by certain technical devices which operate in a codified manner, under specific laws, to repress (material) film time. (Gidal, 1976: 4)

The structural/materialist strategies put forward to create non-illusionist cinema were concerned with demystifying the film’s production and spectatorial processes. For the co-op, film became a record of the processes of its making. It was not a representation of some event/action in front of the camera; rather, the film was a record of its own material concerns.

The optical printer in the hands of the structural/materialist filmmaker targeted the obfuscation of the illusionist use of the dominant cinema narrative. The optical printer here, as in the early days of its use in the 1920s and 1930s, was a bespoke, handmade tool, allowing filmmakers to work with found footage and to endlessly rework images frame by frame. Little Dog for Roger (1967) by Malcolm Le Grice, for instance, re-photographed an old 9.5mm film. Presented as a continuous strip, with the sprocket holes visible, a sequence is repeated at different speeds, with freeze frames and displacement within the image field. The filmic process – the grain, emulsion, and materiality of the film and its projection – become the focus of the ‘content’:

‘Film as Film’ is an equivalence to the modernist view that the meaning and aesthetic base of a work derives from its material rather than from an illusionist representation. Stressing the primacy of the work as material, as process, and constructing the aesthetic experience from the characteristics of the medium, is not to eliminate meaning, or the symbolic, but to shift it to an arena where the art work becomes a component in the developing world rather than a passive reflection on it.
Meaning is formed in and by the work as it moves dynamically from the acts of making into its passage through the world. (Le Grice, 2001: 275)

Structural/materialist film in this reading sees the film image less as a direct copy of an external world and more as a record of the traces of the material process of the film’s production, including that of the apparatus of the optical printer itself. When Peter Wollen wrote of the two avant-gardes (1975), he attempted to critique the structural and structural/materialist practices and those of the political film, whose leading proponents were the likes of Godard and Straub-Huillet, as two different paths taken in avant-garde film practice. The cinema of Godard and Straub-Huillet does not forego narrative, as is the case with structural film, but has its own strategies for the “deconstruction” of the old forms of cinematic expression. In his *The Brechtian Aspects of Radical Cinema* (1981), Martin Walsh groups together an assortment of filmmakers who were concerned with exploring Brecht’s ideas about art and theatre within the cinematic context to represent historical and contemporary social and class relations.

This purported other avant-garde, as asserted by Wollen, had a different origin, aesthetic base, and economic framework. He polarised a discussion between two seemingly distinct approaches to avant-garde practice, which did not give a full picture to the spectrum of practice that was occurring at the time and subsequently. Critiques of what is now termed artists’ film and video suggest the polarising of not only this discussion but also the status of structural/materialist films, in particular their anti-narrative stance. This has led to the exclusion of much multi-screen and expanded work from the history of experimental film and video, thus leaving us with a narrow official institutionalised history (Hatfield, 2003). Works such as Sandra Lahire’s *Plutonium Blonde* (1987) were created using the London Film-Makers’ Co-op’s optical printer, exploring the effects of technology, in this case radiation, on the body (Smith, 2006), alongside concerns for women’s identity, power, and processes of control through the
layering of sound and image. Lahire’s work, like much of the work that was coming out of the co-op, could not be simply characterised within the categories of anti-narrative and anti-illusionist, though it could be considered oppositional. The optical printer became an articulation of the co-op’s ethos to make the technology: the means by which members could gain the skills and knowledge, as well as the use of production equipment, for the purpose of making moving images. The optical printer articulated an oppositional practice for the co-op both in terms of a concern for understanding how moving images came to have meaning, such as the anti-illusionist concern of the structural/materialist filmmakers, and as an economic opposition in the form of cooperative practice. How these concerns can be archived is a matter that is further explored in Chapter Four.

2.4 The optical printer and the archivist

The other significant use of the optical printer is by the film archivist, where “duplication” is a necessary step in the restoration and preservation process, facilitated by a range of printers (Read and Meyer, 2000). As previously mentioned, there are two main types of printers developed for duplication: the contact and the optical. The optical printer offers advantages over the contact printer in its ability to allow for the duplication of shrunken films, its ability to enlarge and reduce the image, and its ability to reframe horizontally and vertically (Read and Meyer, 2000). The optical printer’s use here seemingly apes structural/materialist concerns in that the first concern for the archivist is for the material of film. Paul Read and Mark-Paul Meyer’s book *Restoration of Motion Picture Film* (2000) highlights the wealth of technical issues that can confront the archivist and the ways in which the optical printer helps to negate these:

This type of printer is very suitable for archival use, especially when equipped for wet printing. Although many manufacturers made optical printers, only the
best and the most flexible are really suitable for archive use. However, just one
of these printers can carry out all the operations required, and suffer principally
from the shortcoming that they are generally, with the exception of the Debric
TAI, rather slow. (Read and Meyer, 2000: 132)

It could be argued (albeit reductively) that in this illustration, the processes used
to restore a film do so in such a way as to render the work of the archivist and therefore
the optical printer invisible. The aim of the archivist is to produce a print from a film
that, due to wear and tear, improper storage, or numerous other reasons, needs to be
preserved via its printing onto another roll of film. The process of re-photographing,
rather than producing a simple contact print, highlights the numerous challenges to the
archivist. The shrinking of film, damaged perforations, scratches, and deterioration of
the original film negative all pose challenges that can be overcome, as Read and Meyer
(2000) suggest. However, for structural/materialist film, it could be suggested that the
concern for the material aspects of film are utilised not to demystify the filmic process
but rather to maintain its illusionistic properties. The viewer in this analysis is not drawn
to question the nature of representation; this can only be done, according to the
structural/materialist filmmaker, “through the individual’s active, participatory
structuring of actuality” (Le Grice, 2001: 170). This “active” structuring is not possible
when the intervention by the archivist is not the focus of the film.

However, the film archive, and this differs between the contexts of national
archives and local niche archives, cannot be so easily charged with only a concern with
duplication for the faithful reproduction of film in the collection; there is an awareness
of a creative dimension:

Today, most film archives and specialist film laboratories are aware of the fact
that mere duplication of the photographic information of a film is not enough.
Films are not interesting only for their information or narrative. The treasures in
the archives are often not properly safeguarded when no justice has been done to
the aesthetic quality of the films, either by an accurate duplication or in a
conscious restoration. (Read and Meyer, 2000: 4)
The interventions necessary in the restoration and reconstruction processes revealed above immediately allude to this practice of manipulation that the structural/materialist filmmaker foregrounded. The archive in this sense does not hold to the notion that it merely pragmatically reproduces and duplicates: there is always a concern for what is changed – the difference engendered by the new photographic process (Read and Meyer, 2000: 1). The nature of this creative dimension alludes to a further question of how notions of this difference can perhaps be read in terms of how the technologies involved in the very processes of duplication and restoration (such as the optical printer) are understood.

2.5 Mother’s mouth

So, how can we understand what it is that the optical printer is doing in relation to the moving image and meaning making? Not wholly an instrument of duplication, its use points to both illusionist and anti-illusionist practices. If we consider the optical printer as an apparatus amongst a network of technologies, utilising the notion of Kittler’s discourse network, we can begin to see how the optical printer acts to produce meaning. The discourse network is used to frame the process of meaning making attributed to media (analogue and digital): that is, how those media and their use constitute a way of deciphering noise into “meaningful” utterances (Wellbery, 1990: XXIX). This approach reflects a materialist approach concerned with technology, independent of its content. However, this chapter builds upon that notion of media and sees the optical printer as a philosophical apparatus, implying a changed way of understanding the image. In reading Kittler’s analysis of media technologies of the discourse network of the 1900s, he ascribes a different operation to that which preceded it. For Kittler, the discourse network of the 1800s was one that saw writing as the pivotal media (Kittler, 1990).
Writing operates by way of a symbolic grid which requires that all data ‘pass through the bottleneck of the signifier’, whereas phono-, photo- and cinematographic analog media process physical effects of the real (Winthrop-Young, 2011: 59)

The photographic media, unlike the symbolic media of language, in this regard are not separate from the object. This is because the output of such media produced data that came about through the storing of the light and sound waves from the object in question. The hegemony of language becomes divided, according to Winthrop-Young in his introduction to and translation of Kittler’s Gramophone, Film, Typewriter (1999), “among media that were specific to the type of information they processed” (Winthrop-Young: 1999: XXV). That is, there is no longer a reliance on symbolic mediation; rather, the phonograph or the gramophone stores the sounds of the objects they record – it is not a likeness that is iterated through another medium, such as type. The gramophone can record and then replay the sounds of a cat meowing, whilst the book can only describe it. Although Kittler’s inclination to posit that the media of the 1900s stored something of the real object is questionable, when we think of animation (for example), what is stored here is a graphical trace; it is not handwriting, as in the order of the discourse network of the 1800s, that gave way to the typewriter. Rather, technological media store the real: that is, they record the “extra-symbolic” (Krämer, 2006: 94). They no longer simply record those elements that are represented in symbolic form but instead record the physical realities themselves. The wind rustling through the leaves as a sound recorded on a phonograph cannot be elucidated in the poetry of Goethe.

Kittler’s materialism, however, holds some resonance if we return to the practices of structural filmmaking. The assertion focuses here not on the storing of light and sound waves of the real object but on the experience of materialist filmic processes in relation to “the physical substance of the film medium – physical base – acetate –
emulsion surface – photochemical response and its chemical development” (Le Grice, 2001: 165) in order to experience the real as that which is presented in front of the viewer. Le Grice distinguishes structural/materialist practice by its concern for presentness (that is, the film’s projection at that given moment: its physical and material aspects). Any other consideration that can be inferred or depicted is not concerned with reality, as it does not address the very thing that is being shown: it is some strategy based on mystification:

The only art which deserves the term realist is that which confronts the audience with the material conditions of the work. Work which seeks to portray ‘reality’ existing in another place at another time is illusionist. (Le Grice, 2001: 170)

Structural/materialist practice confronts the viewer with the notion of reality as presentness, and the utilisation of the optical printer falls within the strategies for exposing the viewer to reality, rather than exploiting perceptual phenomena. Kittler’s definition of a discourse network as “the network of technologies and institutions that allow a given culture to select, store and process relevant data” (Winthrop-Young, 2011: 40) indicates, in relation to the discourse network of the 1800s, how language was inscribed and put to work through the re-organisation of language learning. The mother’s mouth – how children learnt language through the lullabies and sounds uttered to them by their mothers – represented “minimal signifieds” somewhere between real words and meaningless utterances. These sounds were “pregnant with meaning” and, according to Kittler, produced “psychically centered individuals” who saw language as always laden with meaning (Winthrop-Young, 2011: 28-34). These assertions explain for Kittler how meaning is produced, and when the approach is applied to the discourse network of the 1900s, another rupture in his reading of history occurs: the medium of Edison, as has been stated earlier, is one that relegates language, according to Kittler. What Kittler asserts is that the agency of human inscription is
consigned away: the human instead becomes an inscription surface. The mother’s mouth no longer has the same attraction as the primal sound of the phonograph, which uses waves and vibrations.

However, more pointedly, this chapter is concerned with the element of Kittler’s analysis that equated the mother’s mouth with the construction of subjects who saw language as pregnant with meaning. Crary’s *Techniques of the Observer* (1992) elucidates the way in which the “subject” was repositioned through the technologies and apparatus of the 19th century. This subject is seen as part of this reading of the discourse network of the optical printer, which functions as a duplication instrument, optimised for mass production by Linwood Dunn. It is equally able to restore and repair an image as it is to add an image, slow down time, create freeze frames, and create any other number of illusions. It is part of a discursive environment of technologies, which includes Pepper’s ghost techniques, cosmoramas, dioramas, and a plethora of optical and perceptual instruments and contrivances. These devices were concerned with cognitive and perceptual illusions and tricks, as well as instruction. Returning to the thaumatrope, the apparatus, according to Crary, could be considered a philosophical toy, which...

...made unequivocally clear both the fabricated and hallucinatory nature of its image and the rupture between perception and its object (Crary, 1992: 106)

For Crary, the stable subject who could reason their relationship with the world, through representations of external and internal worlds, had been restructured to account for a perception made apparent by the philosophical toys and investigations of the physiology of the body. That is a vision that could be manipulated and that could produce an illusion (such as the afterimages of the thaumatrope) that required no referent in reality. The subject could co-constitute a reality that superimposed the images of each side of the spinning discs. Therefore, it is Crary’s assertions of the
changed subject/observer that lend a fuller account of the optical printer beyond the materialist stance. The structural/materialist concern for the materiality of film can be seen in this context as placing too much weight on the indexicality of the image; rather, there are immaterial dimensions that need to be accounted for, including a co-constitutive metaphysical dimension.

2.6 The immaterial

How can we account for the immaterial aspects of the optical printer? We can take account of Crary’s notion of the subject/observer who has their vision attuned to a certain set of conventions, as elaborated through his genealogy (Crary, 1992). The optical printer can be seen in this respect as part of the continuum of optical devices that can be perceived as philosophical toys or apparatus, shaping perception. The minimal signifieds of Kittler’s “mother’s mouth” of the 1800s become in this reading the minimal signifieds of the articulations of time and space that pervade the technologies in the concepts of Kittler’s discourse network and those of Crary’s periodisation, modernity, and its optical instruments, in his account of the disciplining of vision and bodies in *Techniques of the Observer* (Crary, 1992). Kittler elucidates that the discontinuity between discourse networks is one in which technological media allow for time-axis manipulation. That is, the articulations of time and space are not irreversible, as they are not fixed by syntactical structures, as with writing (Krämer, 2006). Yet this does not fully account for the immaterial dimensions of the optical printer: the metaphysical. Rather, Crary’s observation presents, as Harbord terms it, “metaphysics of interiority” (Harbord, 2012: 103):

The separation of the observer from the scene observed was a production on the level of subject-hood, removing the dynamic inter-play of world and subject and laying the foundation for the institutionalisation of cinematic viewing. (Harbord, 2012: 103)
Can we conceive of the notions of material and subject in relational terms, seeing a co-constitutive interplay beyond the concept of illusion? The ecologist Jakob von Uexküll offers a bridge to understanding the immaterial through the notion of *umwelt*. In *A Foray into the Worlds of Animals and Humans: With a Theory of Meaning* (2010), von Uexküll explores how matter interacts not only with itself but also with other interconnected systems, including organisms (Sagan, 2010). *Umwelt* is von Uexküll’s notion that each animal has its own distinct perceptual world. He terms the process by which meaning making evolves between an animal and its environment and between animals as semiosis. His study of animals and their environments attempted to look beyond the reductive notion that behaviours pinpoint a certain set of cause-and-effect relations; rather, he sought to unravel what our “signalling perceptions” meant beyond the individual (Sagan, 2010). As with other species, we have no complete perceptions of ourselves or the world: we attempt to fill in the gaps in what we cannot perceive. Agamben notes that von Uexküll’s theory allows us to see a world that is not unitary – space and time are not equal for all living things (Agamben, 2004: 40).

Von Uexküll expresses his theory in the thought experiment concerning the spider’s web. The spider’s *umwelt* knows nothing of the world of the fly or its environment and cannot perceive it. This not knowing extends to the spider’s inability to conceive of the fly in terms of its dimensions. For example, there is no one precise fly that the spider can bring to mind in conceptualising a fly, as Agamben suggests a tailor would consider the client for measuring a suit (Agamben, 2004: 41) that would fit a certain size. Yet the spider is able to determine the web according to the dimensions of the fly’s body: the resistance of the threads is proportional to the force of the impact of the fly when flying. The web’s threads have many elements that are suited to capturing the fly, including the facet of the web by which its threads are proportional in such a
way as to reflect the fly’s seeing capability: that is, the fly cannot see the threads and so flies into them. The *umwelts* of the fly and the spider are, however, separate and do not communicate. They cannot see each other’s worlds, yet they seem to act in concert. The fly’s image, Agamben calls it here an archetype, acts in such a way upon the spider that the web can be called “fly-like”. The web expresses the “paradoxical coincidence of this reciprocal blindness” (Agamben, 2004: 41-42).

Väliaho understands how cinema, building beyond Crary’s notion of the observer, speaks to how the body is linked to the technological arrangement of cinema and how the cinema is embodied in the viewer, producing specific *umwels*.

As it establishes functional sensorimotor circuits between the image and the body, the cinema can be seen as giving rise to specific Umwelts, that is, systematic closed wholes, which even define our “species-being” in terms of the affects and actions we are modulated to be capable of. In cinema, the inside is precisely the projected outside, and it is through this kind of organ projection that the moving image turns into an Umwelt which we become aware of and, furthermore, with respect to which we become aware of ourselves in the sense of being capable of anticipating the future, having desires, passions and producing meaningful action. The image turns into a circuit of perception cues (perceptions and affections) and effector cues (actions). (Väliaho, 2010: 104)

The optical printer, as in the thought experiment of the spider’s web, gives rise to “specific Umwelts”. The optical printer contains within it an imaginary dimension: an “image” or “archetype” that represents not only itself but also those other elements that are in the wider environment that leave a trace upon it. This reading of human agency opens up Kittler’s assertion that in the discourse network of the 1900s, where the typewriter caused human inscription to be relegated, humans became an inscription surface. Rather, a reading through von Uexküll’s *umwelt* allows for the understanding that inscription is co-constituted. In accounting for the imaginary dimensions, the cultural technique of time-axis manipulation can thus be understood within the model of the changed subject position illuminated by Crary but also extended through von Uexküll’s thought experiment. The optical printer is a counterpoint to a wider form, and
a wider whole. The number of the interlacing aspects, these include the material and immaterial, the “film as film”, the structural/materialist indexical image, or as in the special-effects studio and for the archivist as a duplication tool and “studio doctor”\(^7\). There are also other interlacing aspects of the optical printer as a war technology, an instrument of optical and philosophical operation these are all constitutive of the *umwelt* of the optical printer, inflecting it with the notions of the observer, creativity, desire, and imagination of the technologies of the 19th century and the overlapping concerns of science, education, and amusement.

The ways of viewing the moving image archive, particularly focusing on the notion of duplication through the apparatus of the optical printer, as posed by the initial concern of this chapter, take on a different character when viewed through the lens of discourse network theory. The optical printer, a seemingly benign instrument within the production and archiving of film, can now be seen as a philosophical apparatus, an active inscribing agent, with which moving image work can also be seen as indexical. This bespoke instrument of the early film studios and the London Film-Makers’ Co-op can be situated within the contexts of both illusionist and non-illusionist cinema – forms that seem at odds yet are linked materially in practice – and finds some resonance in the archival process. The optical printer can be seen as part of the network that included the optical toys and changed subject position that, according to both Kittler (1999) and Crary (1992), occurred in the nineteenth century. As such, the optical printer becomes imbued with the very notions of subjects that read the multiple as disclosed in the operation of its effects, as every day, particularly in relation to the conceptions of time and space that underpin our sense of causality and agency.

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\(^7\) Linwood Dunn described the optical printer as a “studio doctor” for its ability to solve many problems for the studio during all facets of the film production process for all departments, ranging from the sound department to the property department (Dunn, 1938).
It is in developing Crary’s notion of the changed subject position, extending it through a reading of von Uexküll to account for the further immaterial dimensions of human and non-human agents, that this chapter has attempted to overcome the burden of the indexical link when reading structural/materialist practice. As such, it is no longer a question of the illusionist or non-illusionist cinematic image; rather, thinking about the process of duplication through its apparatus and processes opens up an immaterial network. This network accounts for both the material apparatus and human creativity/imagination as co-constituted within the archival practice itself. Such recognition incites a theoretical framework that moves from a material conception towards an immaterial conception of the moving image archive. It offers up a notion of multiple that not only accounts for contexts but also for a changed perception: that is, the immaterial dimensions of duplication in the moving image through apparatus such as the optical printer multiply the possible ways of understanding and experiencing the world. These can be glimpsed at through an articulation of material, user, and viewer as co-constituting that reality.

This concludes the first part of the media archaeology of the optical printer, situating it within the context of the discourse networks of the 1900s and within the context of the optical apparatus and instruments that were discontinuous with what had come before, producing a changed subject/observer. The second part of this archaeology looks to extend the network from which the optical printer sprung to include other institutions (archives) and frameworks (copyright) in order to understand moving image apparatus in relation to film history. In doing so, the second part of this archaeology moves from duplication and the copy to archiving. Whilst Chapter Two was concerned with the material and immaterial, Chapter Three is concerned with how we archive the un-archivable.
Chapter Three: Paper Prints and Retrieving the Past: A Further Archaeology of the Optical Printer

3.1 Returning to the scenes of our youth

In Bill Morrison’s 1996 12-minute short *The Film of Her*, a Library of Congress clerk, seen in Figure 13, is driven by the memory of an image of a woman he saw in a porn film in his youth to save a collection of paper print film reels. These reels that are central to the plot were stored in a vault at the Library of Congress. The collection held the earliest examples of motion picture films produced and distributed in the US. On the point of destruction, the clerk, whose voice acts as one of two narrators for the film, saves the collection from the incinerator. Searching through the collection of paper film rolls, the clerk eventually finds that image of the woman. Her naked body is rooted within his memory, and he seeks in the restoration of the prints to see her come alive again. Utilising found footage and a voiceover based on interviews with a Library of Congress clerk, Howard Walls, Morrison’s film fictionalises the account of how the Paper Print Collection came to be restored and became a significant resource in the
writing of the history of film. The film attempts to celebrate the marginalised figure of the archivist, whose achievements have been rendered invisible in the larger narrative of origins and the birth of cinema. The film begins with the oft-repeated thought experiment: if a tree falls in a forest and no one is there to hear it, does it make a sound? The film opens up many questions regarding film history, human perception, and the challenge to make visible that which is seemingly lost, forgotten, or never quite present. Within the film, the archivist, the material, and their fragility are made perceptible to the viewer. The challenge of this chapter is to elaborate how archiving the un-archivable can be understood in relation to how we retrieve the irretrievable. The chapter does this by extending the archaeology of the optical printer into the wider network of print and copyright. The praxis of retrievability, like that of time-axis manipulation, requires a co-constitution of bodies and material, further extending the strategies elaborated in the previous chapter.

The first section looks to how paper is negotiated as moving image and why that has implications for our understanding of what moving images are. It further elaborates the notion of the moving image as a network of technologies whose arrangements have implications for our experiences of the world, particularly our relationships with copies and duplicates. It problematises the notion of intertextuality as one approach to expressing the overlapping of moving images with other media forms, such as literature. The chapter then elaborates the case of the Paper Print Collection. The 3,000 films of the collection are the only remaining examples of the films that were being exhibited and produced in the US during the development of early cinema in the late years of the 19th century and the early 20th century. These early examples of films represent a fraction of the films that were produced, but as Edison, Dickson, and others attempted to copyright their films, their deposits with the Library of Congress of paper print copies of their celluloid films are all that remain from this period. The subsequent
efforts to restore these to exhibitable prints are explored here as an illustration of the problem of archiving the un-archivables. The restoration project not only elaborates the entanglement of copyright in the network of moving images but also makes visible the problem of teleological accounts of film’s history. Here, returning to the scenes of our past illustrates the concerns of the first chapter, filled with notions of the archive, which include desire, creativity, and the imaginary. This section reflects on both the challenges and development of film historiography and innovations in moving image technologies. The final section of this chapter explores Ken Jacobs’ 1969 experimental film *Tom, Tom, the Piper’s Son* to seek strategies to the problem of archiving the un-archivables. Jacobs’ film experiment acts as a final exploration of the paper prints and the concerns that have been raised in relation to history and moving images. The chapter concludes with how the optical printer can be strategised as a model for the instrumentation of the archive through practice.

### 3.2 A network of paper and moving images

This section addresses how paper technologies overlap with moving image technologies. It asks the question of how we move from one media to another. In particular, it deals with how a medium such as paper plays a part in the technological history of moving images. The question elicits the same concerns raised by historians of technology, such as Edgerton (2011) and Nye (2007): that old technologies are not simply superseded by the new; rather, they continue to permeate. Is this persistence a matter of remediation, where the new medium delivers in part a “refashioning” of the older one (Bolter, Grusin, and Grusin, 2000)? In thinking about the assemblage of things that link paper and the moving image, this section qualifies the entanglement of media in relation to moving images by situating their overlapping and interconnected natures by means of the relationship of one image to another. Each overlap can be
understood by mobilising the wider network at work in the particular context of making and viewing, as well as understanding the notion of the copy as alleviating the necessity for origins: that is, the birth of one medium, superseded in a linear fashion by another.

Firstly, considering paper and the moving image brings forth a variety of forms: movie posters on the sides of buses that herald the arrival of a new film; adverts in daily newspapers and weekly and monthly magazines; posters that hang in the cinema auditorium as you wait in line for your tickets, and in the hands of avid film collectors; and film postcards that twirl in carousels in shops as you exit a gallery, museum, or cinema. These are all paper representations of the moving image. The overlapping of print technologies with moving image technologies has been elucidated in accounts such as Richard Brown’s *Film and Postcards – Cross Media Symbiosis in Early Bamforth Films* (2005).

In 1870, Bamforth and Co. started out as studio photographers before developing the company into a manufacturer of magic lantern slides. With a studio set up to photograph the mainly life model slides, the company was ideally placed to also produce films. The company formed a partnership with the Riley Brothers of Bradford, whose moving image technology supplemented Bamforth’s know-how. The company was also ideally placed to embrace the growing market for postcards (Brown, 1996). The factory environment allowed both the technological means for the production of slides, postcards, and film and the understanding of audiences who craved the variety of entertainments that dominated the music halls, fairgrounds, homes, and lecture rooms of the 19th century (Nasaw, 1999). The story of Bamforth and Co.’s forays into film production via studio photography, magic lantern slide production, and postcard manufacture is not unusual. Rather, the entanglement of these early entrepreneurs with mass entertainments was coproduced by the expectations, desires, and imaginations of audiences at the time. Michael Punt’s *Early Cinema and the Technological Imaginary*
(2000) highlights the network of entrepreneurs, engineers, audiences, and imaginations as a necessary framework for understanding how the moving image in the form of cinema came about in the arrangement that it did. That is, the development of moving image technologies, standardised into the arrangement of cinema, was never a foregone conclusion (Punt, 2000).

Looking further into the entanglement of paper and the moving image, the overlap of print media and optical media at the end of the 19th century and the beginning of the 20th century was never a one-way enterprise. Print media were not superseded by the influx of optical technologies; rather, new forms were elaborated and old forms were extended. In return, the new optical technologies relied upon the audiences and conventions of the older technologies. This is considered in literature studies, where the visual imagery and motifs of the new optical technologies are alluded to in printed text, the techniques of dissolves and fades that were utilised in magic lantern or phantasmagoria shows find themselves in the texts of the time (Plunkett, 2005). Beyond this formal overlap, the concern here is with the material implications of the entanglement of print and optical media.

Writers’ intra-textual use of optical motifs was replicated by a more material crossover between optical recreations and the publishing industry. The success of the various optical shows led to many attempts to recreate the same aesthetic effect through games, books, prints and domestic devices. (Plunkett, 2005: 13)

The panorama, a 17th-century invention patented by Barker, was miniaturised for home use (Plunkett, 2005; Huhtamo, 2013). However, the domestication of the medium had a variety of facets to it. Print media, within their own discourse network, were extended in the wake of the growth of pictorial journalism. The first graphic-based weekly, The Illustrated London News, which began circulation in 1842, soon had competitors in the field, with its focus on engraved accounts of the weekly events of
These accounts overlapped with the mass interest in entertainments such as Barker’s panorama by offering to its most loyal subscribers a print of the panorama of London (Plunkett, 2005). What is notable in Plunkett’s account is that *The Illustrated London News* was able to promote its own novelty by reflecting that of the experiences of visiting the panorama and use of the daguerreotypes of Antoine Claudet (Plunkett, 2005). The transforming landscape of newspapers in England, which saw new forms emerging, such as illustrated newspapers, also emerged alongside experiences of optical technologies that were producing audiences accustomed to a changed sense of their place in the world. As in the previous chapter, the circulation and development of illustrated newspapers occurred during the discourse network of the 1900s. The audience was that of Crary’s observer, whose subjecthood was shifted to that of an observer whose perception was not fixed but rather mobile.

Another facet of the overlap of print media and optical technologies was in the production of miniatures that were domesticised not only through their appearance in weekly periodicals such as newspapers but also in their miniaturisation as toys. Above, it was noted that the photographic images and magic lantern slides were transformed in the studio/factory set up by Bamforth and Co. to produce not only moving images but also postcards, which the company became most famous for. However, we shall return to the panorama, which became synonymous not only with Barker’s patented technology but also with the notion of vaunted views, which were becoming an everyday view (Plunkett, 2005) – a vision that was not restricted by the limitations of human vision (Oettermann, 1997). The technology was used to manufacture toys for the instruction of children and use in the home. Plunkett highlights that during the latter part of the 18th century, “there were a series of illustrated children’s gift books that were modelled as a panorama or peepshow.” (Plunkett, 2005: 15). However, it was the cinematograph that had a distinct influence on the “material form” of books, according
to Plunkett (2005: 25). Flickbooks, or flipbooks, began to be produced in large numbers at the end of the 19th century and the beginning of the 20th century. Plunkett highlights how the moving image picture book aped the effect of the cinematograph and similar optical technologies, in particular the concern for movement that gained mass appeal. These early moving image or motion picture books made use of early cinematic films, which were concerned with elaborating specific qualities that emphasised what was novel about the technology, namely movement. The early film sequences that the flipbooks plundered for most dramatic effect, as Plunkett identifies, were those that contained dance movements. “The shimmering motion of serpentine dancers was a favourite subject of early cinematographers, being filmed by, among others, Edison in New York and Gaumont in Paris” (Plunkett, 2005: 25). Similar to The Burning Stable film of the previous chapter, early motion pictures, particularly in encapsulating movement and action, could be used for the growing flipbook market. Another emphasis of early moving images was another burgeoning technological invention, namely the locomotive, which has its own overlap with moving image technology, characterised by Hale’s Tours, phantom rides, moving panoramas, and cycloramas. However, Plunkett focuses on how the emerging flipbooks added various attachments, such as transparencies or coloured lenses, the aim of which was to combine print technology with the effects of cinematographic technology to give the illusion of movement.

On the one hand, producers of print media were co-opting the effects of early moving image technologies into their creations, utilising attachments and techniques to emphasise the illusion of movement. On the other hand, the manufactures of early moving image works were able to feed into the print media market by also creating derivations of their films to produce crossover products and technologies. The flipbook

8 An example of a moving panorama is described in Chapter One of the thesis.
is notable as a technology that is a formation of the concerns of early cinematic and pre-cinematic technologies that were concerned with cognitive processes whilst being produced within a network of print media. These technologies reflected an increased appetite from audiences in their everyday lives to view the world according to the new vantage points that were being made available. Early cinematic technologies, such as flipbooks, were entangled in a circulation of apparatus that were contrived through an interrelation of the prevailing networks of other technologies, such as print, locomotive, and optical technologies. They were concerned with effects, the implications of cognitive processes, and imaginative appeals to audiences. The technologies of the Kinetoscope, Mutoscope, Filoscope, and the Kinora, to name just a few, were entangled in multiple networks of media. Moving images therefore transcend the notion of a linear progression of technological development that led to the arrangement of cinema.

Considering these technologies as demonstrating the relationship of one image to another, what differentiates them as distinct apparatus is alluded to in Plunkett’s observation about flipbooks. Illustrating the illusion of movement through additional attachments such as transparencies and lenses required the intervening act of the user. The apparatus worked in conjunction with a viewer/user, who was operating a technology that required a level of energy to produce a certain set of results. Flipbooks, like Kinoras, Mutoscopes, and Filoscopes, were only useful in providing the illusion of movement through the actual movement of the user in flicking pages or turning handles in connection with the apparatus. This produced a certain tension exemplifying how and what kind of movement was possible and in doing so exemplified the ways in which meaning in the 1900s could be understood.
3.3 Paper prints

The network of print and film, however, is not a matter of intertextuality: that is, of supplementing the effects of one medium with those of another in order to add depth to a text. As in the previous analysis of Letter from an Unknown Woman, how moving image technologies develop can be seen beyond notions of remediation or convergence. Rather, they develop in the ways in which media store and retrieve meanings in relation to their specific context of use and within their wider network of assemblage. The example above highlights that flipbooks do not merely ape the moving image in order to deepen a reader’s connection with a given text; rather, they express the wider network at work. This network is further explored here in the case of the Paper Print Collection. It allows us to think through the ways in which moving image technologies and practices can be understood as a network that must account for the creativity of the engineers, the prospecting of entrepreneurs, the desires and imaginations of audiences, and the material affordances of instruments. What is elaborated is an interconnectedness of institutions (courts, museums, archives, and record offices), practices (archiving, researching, and exhibiting), and creating histories and knowledge (film studies, film historiography, and laws) to go beyond a tendency to privilege a narrative of progress from the birth and invention of film to its cultural arrangement as cinema. This is a tendency that, according to Elsaesser, requires a new mapping of the moving image in the wake of research over the last 30 years on early cinema, which has led to a better understanding of changes in audio-visual media technologies.

Key elements of cinematic perception have become internalised as our modes of cognition and embodied experience, such that the “cinema effect” may be most present where its apparatus and technologies are least perceptible. Cinema’s role in transforming the past and historical representation into collective memory is now a matter of intense debate, while its “invisible hand” in our affective life and in our modes of being-in-the-world—our ontologies—has preoccupied psychoanalysis and philosophy… (Elsaesser, 2004: 76)
Starting from an exposition of the case of the Paper Print Collection at the Library of Congress, the remaining part of this chapter explores how to move beyond intertextuality to think of the moving image as the interaction between material apparatus and the viewer, framed within the context of its use as a way of understanding the ontologies of the moving image.

3.4 Paper prints and early cinema

In the year 1887, the idea occurred to me that it was possible to devise an instrument which should do for the eye what the phonograph does for the ear, and that by a combination of the two all motion and sound could be recorded and reproduced simultaneously. (Edison in Dickson and Dickson, 1894: 206)

Edison’s development of the Kinetoscope and Kinetograph was the outcome of his attempts to do for the eye what the phonograph had done for the ear. The Kinetograph (a film camera) and the Kinetoscope (a film viewer) were developed in Edison’s lab utilising Eastman’s celluloid film. Edison’s assistant, W. K. L. Dickson, was left by Edison to develop the technology for the Kinetoscope, which was to be the basis for much projection-based moving image technology. The Kinetoscope, a peephole box that allowed one user at a time to view a short loop of film, developed one answer to how to convey celluloid across a light source with an intermittent shutter to bring about the illusion of movement. Banks of Kinetoscopes were installed in amusement parlours, located at the intersections of the business and entertainment districts, showing different film loops for the viewing pleasure of their audiences (Nasaw, 1999).

The development of the Kinetograph and the Kinetoscope speaks to the network of inventions and innovations that were rapidly being developed in the late 19th century. The notion of a “birth of cinema” has been widely critiqued; scholars have highlighted the competing developments and innovations that were evident at this time,
also highlighting the competition to patent and copyright such innovations (Punt, 2000; Op den Kamp, forthcoming). Whilst the Lumières’ cinematograph may be the arrangement that now best fits our notion of the moving image, the Kinetoscope, in the guise of another of Edison’s assistants (Fred Ott), gave us the first instance of the copyright of a motion picture: Fred Ott’s Sneeze. Dickson, given the task of developing the Kinetoscope in Edison’s lab, along with establishing a film studio in which to test out and film the subsequent experiments with the Kinetograph, had also been responsible for ensuring Edison’s copyright. It was Dickson who registered the short sequence of Fred Ott’s sneeze for copyright (Loughney, 1988). In 1894, Edison Kinetoscopic Record of a Sneeze was the first surviving motion picture to be registered for protection. Dickson, familiar with copyright and patent in relation to many of the inventions that came out of the Edison lab, had registered a series of photographs: a “contact copy” of the film on a card (Grimm, 1999). The new form utilised photographs as a reference, which was the only way in which a motion picture could be registered for copyright – as a series of photographs.

From 1894 until 1912, paper prints were utilised for copyright protection. The law changed in 1912, but motion picture and other media were being registered in this form up until 1940, with paper prints being deposited up until 1915. After 1940, the Library of Congress was able to store the nitrate prints from films that were registered. There was no standardised way of submitting these early films for copyright; some studios submitted entire films as bromide paper prints, as was the case with the American Film Manufacturing Company. Other companies, such as the American Mutoscope and Biograph Company, copied five-frame segments where there were scene changes within the film as proof of registration. As a result of this endeavour to copyright film and gain protection over their inventions, over 3,000 complete positive
prints of the earliest examples of motion pictures exist as paper prints in the Library of Congress.

3.5 Paper prints as legal entities

During the period 1894 -1912 in the UK motion pictures were similarly being protected as photographs. Photography was protected under the category of fine arts (Brown, 1996) within the legislation. One of the main uses of these photographic registrations was to deal with the complaints that scenarios were being stolen and used by unscrupulous producers, along with the problem of “duping”: copying all or parts of films and exhibitors passing them off as their own. In the UK, as the new form of moving images was considered, there were plans to copyright the whole of a film, considering the whole series of photographs that made up the film as one picture, along with all the negatives and positives associated with it. Registered films were deposited at Stationers’ Hall. Brown notes that whilst there were some cases of infringements of the projector movement patents, and some to do with the use of photographs from films, these cases were mainly concerned with singular film images that required that they were previously registered in order that a case could be made (Brown, 1996). As multi-scene fictional films appeared, filmmakers were careful to “register a frame from each scene”, as the combination of a sequence of images was not copyrightable (Brown, 1996). It was also possible to protect the presentation of a film, such as the precise running order of a show of films alongside the choice of musical accompaniment. In the US, the concern for duping was also linked to the legal frameworks that contributed to the characterisation of what a motion picture was: story, performance, exhibition, and form. Edison’s concern to control his patents for the technology saw him look to use

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9 Duping is the process by which film companies obtained a print of a film, copied it, and either sold or exhibited the film as their own (Decherney, 2012: 19).
legalistic means to try to link the content to the form. These attempts to copyright films and standardise the technology led to much legal wrangling.\(^\text{10}\) However, the Paper Print Collection highlights the tension between the mode of knowledge production as it is and as it is rationalised as a formal institutional form. The tautological histories that repeat the adage of the birth of cinema fail to account for the incoherent copyright standards and the way in which they account for and shape our understanding of film history.

![Figure 14. A paper print reel (Ken Weissman, Library of Congress, creative.cow.net).](image)

The notion of copyright is situated within the network of moving images, as well as within the separate networks of law and the judiciary. The overlapping of copyright constraints, new technologies, and film history (aesthetics and historiography) highlights that moving images have to be understood as a network within a wider contextual relationship beyond film as cinema. Film considered therefore as a medium amongst other media, that also encompasses other institutions, such as law courts and museums. One of the cinematic accounts of the Paper Print Collection illustrated above is *The Film of Her* (1996), which narrativises film history as the release of the medium from the stranglehold of old modes of the archives – the republic of scholars, as

\(^{10}\) Peter Decherney’s *Hollywood’s Copyright Wars: From Edison to the Internet* highlights the legal entanglements that have encompassed the moving image, particularly as the new form of motion pictures was being delineated (Decherney, 2012). Likewise, Op den Kamp’s *The Greatest Films Never Seen: The Film Archive and the Copyright Smokescreen* (Op den Kamp, forthcoming) highlights how copyright helps to shape film historiography and film history.
characterised by Kittler. It is the story of a Library of Congress clerk who saves a paper print from incineration. Morrison’s film points to the invisible roles of the archive, the archivists, and the structures that maintain institutions such as the Library of Congress. *The Film of Her* also points to the role of legal frameworks concerning property and creativity, which are also implicated in how moving images have been arranged and standardised into a form by which they can be copied, stored, and retrieved. The subsequent preservation of the Paper Print Collection and its transfer to film have allowed us to view some of the earliest films that formed the basis of film history. The films that were preserved as paper prints outlived the nitrate films, which, due to their chemical instability, being recycled for their nitrate content, or just being discarded, have disappeared. They account for a small percentage of what was saved, not what was produced. The paper prints achieve one notion of the un-archivable if we consider how the paper entities have outlived the very thing that was their referent, yet that referent was also only a partial reference to what was produced at the time.

### 3.6 Paper print and moving image technologies

The un-archivable was outlined in the introductory chapter: those moving image works that resist the archive due to a range of considerations, such as their ephemerality, their radical concerns and oppositional modes, and technological obsolescence. The paper prints illustrate some of the above concerns. So how do paper prints archive the un-archivable? As explored above, one way in which the legal framework of copyright was entangled within the process by which the moving image in the form of cinema came to be standardised was through the Paper Print Collection. However, the paper prints can be further elaborated as an example of archiving the un-archivable, through the extended process by which the paper prints were preserved and restored to projectable moving images. This encounter returns us to the second part of the archaeology of the
optical printer and augments the narrative-driven exposition in *The Film of Her* (Morrison, 1996) into a media archaeology.

Morrison’s use of found footage and the forgotten archivist’s voiceover foregrounds the encounter amongst film history, memory, and desire (Paletz, 2001). What eludes this account is the role that the cinematic technologies employed in the restoration efforts play in how the materials remain accessible, beyond their seemingly material constraints and institutional machinations. The never-quite-lost paper prints were fed back through the technology of their making so that they could re-emerge as celluloid film. There have been a number of projects to restore the Paper Print Collection, all attempting to restore the 3,000 paper films into viewable 35mm or 16mm film prints. The first attempts began in 1942 under Howard Walls, who first catalogued the collection at the library, which led to a plan to restore the prints back to moving images. Seeking the help of Carl Lewis Gregory, a motion picture engineer with the American National Archives, it was understood that the archive’s motion picture division had an optical printer that may be of use in Walls’ attempts to restore the prints. More importantly, the connection to Gregory was useful not only due to his understanding of the optical printer but also, more critically and fortuitously, as Gregory already had knowledge of the paper prints. Gregory had been employed at Edison’s laboratory and had been responsible for producing paper prints for registration purposes whilst he worked there. Whilst copyright law had changed to include motion pictures by 1912, the practice of paper prints had continued up until 1915 (Grimm, 1999). Gregory,

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11 Morrison interviewed the archivist Howard Walls as part of the research for the film, and Walls is the basis for the voiceover within it. Whilst Kemp Niver was credited with leading the restoration project of the paper prints, receiving an Oscar for his efforts, scholarship on the history of the collection places a different emphasis on his role, particularly in contrast to the history, which had mainly been written by Niver himself. Niver had written Walls out of the history of the Paper Print Collection, despite the role played by Walls in cataloguing the works and in the early attempts to restore them. Niver was not the only interested party to consider the collection important. The perceived history suggested by Niver is one where he had discovered this treasure trove of early cinema and saved it from destruction. Current research, however, acknowledges that whilst the collection may not have been maintained, it was never lost (Paletz, 2001; Grimm, 1999).
having already developed an optical printer to deal with brittle and shrunken film, as discussed in the previous chapter, was able to use this printer in a modified form for the purpose of attempting to reanimate the paper prints.

A modified Process Optical Printer was designed with a special projection head having interchangeable sprockets and pull down pins to take without mutilation any old 35mm film. An adjustable aperture plate permitted framing any off standard frame lines. The camera head of the printer was provided with interchangeable aperture plates so that the old film could be reproduced to either silent or sound standard. (Gregory, 1944: 165)

The likeness to the problems of working with damaged prints in general was obvious to the engineer in his account of the process to restore the paper prints, as discussed in Resurrection of Early Motion Pictures (Gregory, 1944):

…the resemblance of the fragile paper strips to that of old films was striking. Of course, the paper film could not be illuminated by transmitted light, but it could be photographed by reflected light. Why not, therefore, rig lights to illuminate its picture surface and copy it frame by frame on the process machine? (Gregory, 1944: 165).

Gregory’s account of the “resurrection” of the paper prints explains that he utilised an array of early and pre-cinematic technological approaches to optimise the optical printer, which encompassed the main facets of moving image technology, from conveying the print through the projector to transforming the light source.

Copying of imperforate ribbons is also a grave problem and presents two main alternatives: the first, and the easier of these, is to devise a gripper movement with feed and take-up rollers instead of a shuttle movement and sprocket wheels. Such movements were used in some of the old coin-in slot machines that used this type of mechanism to show movies on paper ribbon. The second alternative is to perforate each frame after registration in a frame-registering device. This, of course would be a long tedious process similar in method to that of animated cartoon photography… (Gregory, 1944: 168)

Gregory’s endeavours, illustrated by lantern slides at the Society of Motion Picture Engineers technical conference, was the beginning of the enterprise to restore
the paper prints to an exhibitable mode through a long process of frame-by-frame
photography, as illustrated in Figure 15.

![Optical printer conveying a paper print, with Walls and Gregory (National Records
and Records Administration).](image)

Figure 15. Optical printer conveying a paper print, with Walls and Gregory (National Records
and Records Administration).

The project, whilst gaining some support, was lacking funding, so the library
combined its efforts with RKO Pathé to fund the production of negatives of the paper
prints. The project saw Richard Fleischer, the director of RKO Pathé’s Flicker
Flashback series – where silent films were updated to include “sound effects and comic
narration” (Grimm, 1999: 210) – use the Paper Print Collection as content for his series.
The library would be sent a duplicate negative, and Fleischer would send raw stock to
Gregory for processing at the National Archives. The project continued up until the
library lost access to the optical printer and RKO took over the duplication process in-
house (Grimm, 1999; Paletz, 2001). The in-house knowledge came from Linwood
Dunn, who was a special-effects technician at RKO and the leading authority on optical
printers at the time. He had, as recounted in the previous chapter, already begun
development on the Acme-Dunn optical printer for the armed forces at the behest of
Kodak and the government. Dunn, like Gregory, devised a bespoke optical printer to
convey the paper prints using a reflective light source to project. The material restored
was what director Fleischer used in his Flashback productions, with the end of the series in 1949 – bringing to an end this attempt to restore the paper prints (Grimm, 1999; Paletz, 2001).

The next attempt to restore the paper prints came when Walls instigated a relationship with the Academy of Motion Picture Arts and Sciences. In 1947, Walls managed to get agreement between the academy and the library for further restoration of the prints. Walls was eventually taken off the project, following concerns over missing prints (Grimm, 1999), and it was at this point that Kemp Niver entered the scene. The ex-police detective was sent to track down the missing prints and then latterly took on the project to restore them. As in all previous incarnations of the project, a bespoke optical printer had to be designed in order to convey the prints and photograph them frame by frame. Prior to Niver’s approach, Walls had utilised a Douglas Hiedanus-designed optical printer; between 1953 and 1967, Niver likewise utilised an Ovi Sehstead printer, which registered frame by frame onto 16mm film. William Ault, a former assistant of Niver, was part of the team that continued to restore the paper prints at UCLA, restoring them to 35mm prints in the 1980s (Paletz, 2001). The project modified a Niver printer, replacing it with 35mm film stock. Whilst Niver’s project had been successful in making exhibition prints of the 3,000 films in the collection, the 16mm prints were not always considered faithful reproductions. There were decisions made to omit certain images during the process, as they were considered problematic because of “cosmetic” reasons, such as fogging; this meant that the reproductions were not always mirrors of the paper prints (Gaudreault, Lamotte, and Barnard, 2003). Within the new 35mm project, Ault still required a process that used frame-by-frame photography, which was highly labour intensive. The restoration project was invigorated once more with the installation of the TRIS printer.
One of the main modifications to this printer was to change the aerial image lens to a printing Nikor lens. This is specially designed for printing flat images. The TRIS is controlled by a series of stepper motors that advance each frame of the paper print (mounted on reels) at a predetermined distance. The image itself is illuminated by a set of fiber optic cables that produce a consistent yet cool light source. This image is split and routed to the 35mm camera that is part of this printer and also reproduced on a video monitor. (Grimm, 1997: no pagination)

The process was aided by use of the Acme printer for paper prints with perforations, but it continued to be a frame-by-frame registration process. The TRIS system developed a computer-assisted registration process, which alongside the video monitoring made for better alignment (Grimm, 1997). Alignment was key to getting the best image to avoid unsteady and jittery images.

![TRIS printer and Kinetta paper print scanner prototype](http://cinefan.tripod.com/) and Kinetta (http://www.kinetta.com/).

In 2003, the Library of Congress proposed to continue the restoration project, looking to develop a digital alternative to the TRIS seen in Figure 16. The Kinetta Archival Scanner, also seen in Figure 16, came about as a modification for a design for an archival telecine system.

![Figure 16. The TRIS printer and the Kinetta paper print scanner prototype](http://cinefan.tripod.com/)

Rather than advance the paper print frame-by-frame and attempt to align it perfectly, it was decided to stick with far gentler continuous film movement, and use a pair of diffused pulsed-xenon lamps, triggered by optical sensors, to freeze the image of the moving paper print for capture by a 2K x 2K monochrome digital camera. This data was captured as a 12-bit log image, and stored onto hard drives. (Kreines, 2009: no pagination)
The captured film could be cleaned up digitally and transferred to 35mm via the Kinetta’s 4K Film Recorder. Filmmaker Jeff Kreines’ prototype scanner combined off-the-shelf parts with designing for the specific needs of the Paper Print Collection. The configuration is similar to an optical printer in its ability to reposition, crop, and rotate the image optically, and, like the history of the optical printer itself, the Kinetta Film Scanner was at the outset a bespoke machine and prototype.

The development of film-scanning technology cued an overlap of a different arrangement of technologies, in part pointing towards how computers overlap with moving image technologies. The development of optical printers with scanning and computer technology had already begun to be advanced in the work of filmmakers such as the Whitney Brothers. Alluded to in the previous chapter, the advances here again point to discontinuities and ruptures, rather than a continuous development from medium to medium. What becomes apparent in the overlapping archaeologies of paper prints and optical printers are how the optical printer negotiates the copy as a process, amongst engineer, filmmaker, archivist, and viewer. Film history and moving image technology overlap and furnish themselves with new materials from which to construct new histories and new technologies.

3.7 Controllable time, paper prints, and optical printers

The optical printer, as stated previously, is simply an arrangement of projector and camera: a combination that facilitated the restoration of paper prints and in so doing allowed film history to reconsider its teleological origins. The projector in this archaeology, following on from Edison’s Kinetoscope to the Lumières’ cinematograph, once standardised, allowed for the ascendancy of the moving image over sound, in Kittler’s observation (1999). The observation is that cinema was to be an add-on to the phonograph in Edison’s assemble, but the failure to synchronise sound and image meant
that image, where “processing was a matter of equidistant scanning” (Kittler, 1999: 171), was elevated above sound:

> Which is why Edison’s master–slave relationship was turned on its head, and film, with its controllable time, took the lead. Mass-media research, with stacks of books on film and hardly any on gramophony, followed in its wake. (Kittler, 1999: 171)

Synchronisation of sound and image was not the only reason why Edison’s model of cinema did not take hold. However, Kittler’s reflection on “controllable time” (Kittler, 1999: 171) is in the hands of the archivist and the filmmaker an inseparable element of what makes the optical printer an apparatus of immaterial operation. Controllable time or time-axis manipulation, as posited in the previous chapter, is a facet of moving image practice that seems relegated to the automated apparatus as we see the development of moving image cameras, projectors, scanners, and printers. Controllable time becomes a necessary notion when we consider how moving image technologies are innovated, particular in relation to the process of retrieving what has been stored through the process of duplication. The notion is further explored here in the relationships amongst archiving, early cinema, and experimental film.

In the late 1960s, filmmaker Ken Jacobs, whilst teaching film in New York, heard about the Paper Print Collection at the Library of Congress and began showing prints to his students as part of his teaching. The restoration project at this point was under Niver and was concerned with producing 16mm prints of the whole collection. It was at this point in the collection’s restoration phase that Jacobs began to experiment with the material that was made available. Jacobs’ 1969 film *Tom, Tom, the Piper’s Son*

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12 Punt’s (2000: 25) account of early cinema shows that the history of cinema’s origins suggests no one singular impetus to produce moving images amongst the inventors and innovators working on the technology, nor a clamouring audience that was driving the cause to produce, such as entertainment.
takes the 1905 film *Tom, Tom, the Piper’s Son*, which is attributed to Billy Bitzer\(^\text{13}\) and is a product of the American Mutoscope & Biograph Company, as a focus for its own interrogation of the filmic medium. Bitzer’s film is a short 10-minute film based on the nursery rhyme. Set amongst a fair, with all its spectators, viewers, and users, Tom steals a pig and what ensues is a chase film. Jacobs utilises the film as found footage: the 10-minute film is transformed into a 1 hour and 55-minute exposition of the material. The film is re-photographed and structured, with the first part consisting of the original 10-minute film. The second part of the film consisting of Jacobs’ reworking of the material, the third section repeating the 10-minute original, and the final short section acting as an epilogue. In the second part of the film, where Jacobs re-photographs the original, individual elements of the film are brought into intense focus for the viewing audience.

The film has often been understood within the context of structural filmmaking. Jacobs’ film, sequence by sequence, frame by frame, zooms in on the image, changing the speed and running the film backwards and forwards as part of his examination. The original film, concerned in part with the use of tableau to convey its plot, is, according to filmmaker Birgit Hein, Jacobs moving “from the reality of representation to the reality of the film-strip and its material constitution” (Hein, 1979: 98). The structuring approach that Jacobs takes can be read as an examination of “film as film”: that is, the 10-minute sequence is presented for the audience as the material image, frame by frame explored by optical means. The zooming in on, slowing down of and speeding up of the film bring to the fore for the viewer the very mechanisms necessary to construct moving images. Jacobs’ analysis begins after showing the original and breaking down the first tableau.

\(^{13}\) Bitzer is often attributed as the director, as he was one of two key camera operators contracted at the American Mutoscope & Biograph Company at the time (Pierson, James, and Arthur, 2011).
…into medium shots and close-ups, at least revealing to us the theft of the pig. He then proceeds to demonstrate the frailty of cinematic illusion by bringing his camera even closer to the image, reducing its details to blobs of shadow. Although constantly varied, a similar three-step procedure shapes the structure of Jacobs’ film: a clarification of tableau, the isolation of details and the decomposition of the illusion to its material infrastructure. (Testa, 1992: 12)

The focus on the tableau both in the original and in Jacobs’ *Tom, Tom, the Piper’s Son* highlights another concern. In the overlap between historiography and paper prints, Jacobs’ examination of the tableau structure problematises the notion of early cinema being the “primitive” stage of cinema’s development, with narrative – which is always said to begin with D. W. Griffiths’ efforts – being the birth of cinema proper, using the language of film art as narrative. Jacobs’ examination of the tableau highlights that this notion is but part of the myth of film history. What he reveals for his audience is that Bitzer’s *Tom, Tom, the Piper’s Son* (1905) had its own aesthetics, which were not a precursor to narrative; rather, what is made apparent is a compositional approach that had its base in forms such as the painting. Like other forms of visual expressions, such as Méliès’ trick films, this work was not a form of simplistic manifestation of filmic form but, as Gunning points out, was wholly in keeping with an audience that found its entertainment in a wide array of amusements, such as illusions (Gunning, 1989). The action for *Tom, Tom, the Piper’s Son* takes place in front of painted backdrops, with the opening one being a rendering of Hogarth’s *Southwark Fair* (1733). Jacobs’ reworked elements call attention to the use of painting and the composition (Testa, 1992: 12). Jacobs’ work can be seen as part of that body of avant-garde works that are concerned with early cinema, often using it as their source material (Testa, 1992). Eivind Rossaak acknowledges that the prevailing insights into Jacobs’ film – reading it in terms of its structuralism or its cinephilia – are limited in exploring the many different strategies that are at work in *Tom, Tom, the Piper’s Son*. Rather, he utilises the concept of “acts of delay” to express Jacobs’ approach, with differing acts of
mediation displaying the effects of the “presencing and abscencing of different art and media forms” (Røssaak, 2010: 71).

The acts of delay in Tom, Tom seem rather to re-program motion to other purposes than simply adhering to a narrative or a diegesis. (Røssaak, 2010: 71)

Røssaak’s media archaeology looks to how Jacobs utilises other art forms to investigate film as a layered experience beyond a superficial incorporation of intertextuality. Jacobs’ aims, according to Røssaak, are to make “tangible” and “visible” new areas in the moving image experience.

Jacobs seems rather to investigate film by borrowing effects from other art forms. What appears is not film as such, but how layers of film can be made to appear as a multiple, rather than as a singular essence. (Røssaak, 2010: 71)

Røssaak’s reading is important in seeing Jacobs’ approach in Tom, Tom, the Piper’s Son beyond the confines of structural film as one radical strategy to oppose dominant modes of illusion and narrative. The controllable time that Kittler nominates as a guiding driver of the moving image technology of Edison’s Kinetoscope (Kittler, 1999) can be understood here as the discourse network that implicates notions of time and space, as illustrated in Jacobs’ reworking of Tom, Tom, the Piper’s Son. The minimal signifieds that are necessary for meaning are not limited to “film as film” but rather appear across a number of media, beyond intertextuality. Jacobs attempts to make visible for his viewer the experience of moving images on the perceptual level.

Returning to the optical printer and its assembly, Jacobs’ re-photography for Tom, Tom, the Piper’s Son was not the work of an optical printer as such but rather its arrangement.14 Jacobs projected the original film onto a translucent screen, filming on the other side of the screen with a handheld camera. This arrangement allowed the

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14 Bordwell and Thompson are amongst those who have mistakenly attributed Jacobs’ technique to an optical printer (Røssaak, 2010: 83, note 41).
camera operator to have more mobility around the projected image (Røssaak, 2010). The film was projected using an analytical projector, which allowed for frame-by-frame advancement of the film and varying speeds. The analytical projector, itself a product of war and science,\textsuperscript{15} was utilised in time and motion studies for industry, science, and medicine (Michaelis, 2012) in order to account for every aspect of war, work, and everyday life. The assembly of camera and projector in this regard can be found as early as the 1940 facial cinerecorder. J. G Lynn of the Neurological Institute in New York filmed subjects as they watched a projected film. Thereby, their facial expressions could be recorded and viewed, with detailed analysis of each frame.

Figure 17. Facial cinerecorder, reproduced from J. G. Lynn, courtesy of the American Psychological Association (Michaelis, 2012).

Whilst Lynn’s facial recorder, seen in Figure 17, placed the subject in a position of being observed, Jacobs’ assemblage of camera and projector aims to change the viewers’ subject position. This changed position is one where the presentness of the material is co-constituted with an embodied viewing experience for the filmmaker and for the viewer. The process suggests that viewers negotiate their own archaeology of the

\textsuperscript{15} Røssaak notes that the analytical projector was invented by the US for the Ministry of Defense (Røssaak, 2010: 83, note 40).
moving image. Jacobs invites the viewer to experience the notion of perception that is constructed and co-constituted by the effects of the re-photographed image as an act of perceiving, alongside the perception that is constructed in Bitzer’s original. Through the experience of viewing *Tom, Tom, the Piper’s Son*, the viewer can engage with modes of perception that are historically, technologically, and bodily constituted. Testa suggests that the filmmakers’ role is to resituate the spectator “to collaborate in the rewriting of the history of film, or rather, to its meta-history” (Testa, 1992: 139). Likewise, using the optical printer, which can be seen as an instrument of archival restoration and as a tool of avant-garde film practice, Jacobs re-arranges the assemblage of projector and camera in the conception of *Tom, Tom, the Piper’s Son*. This makes visible the bodily implications of moving image perception that can be hidden within the practices of archiving and filmmaking when we conceive of the optical printer as an assemblage without its own history, allowing the viewer to think and perceive those elements that seem irretrievable in certain arrangements of moving image apparatus.

This chapter has provided a further archaeology of the optical printer, highlighting its entanglement with the Paper Print Collection. The chapter has done so in order to provide an exposition of the problems that occur when thinking through the network of moving image technologies, particularly when considering duplication in relation to the seemingly distinct areas of print (paper) and cinema (film). The chapter has further elaborated notions of intertextuality and has problematised these conceptions within the moving image to characterise a differentiation between ideas of cinema and film. It does so in order to go beyond what “new film history” (Elsaesser, 1990) illustrates as the mode of history making that presents the birth of cinema, as discussed in Chapter One. In detailing a history of the paper print and its role in film historiography, copyright becomes an important element in the network of moving images. The copy becomes an important site by which making, storing, and retrieving
the moving image can be understood and experienced. The paper print not only opens up the moving image to its own histories but was also the site of its technological innovation and differentiation. The project to restore and save some of the earliest renderings of moving images also galvanised elements of its own technological innovation.

The optical printer’s archaeology expresses the multiple modes by which the moving image can be construed and constructed: in the filmmaker’s workshop as a bespoke tool of special effects, as a tool of oppositional practice for the experimental and avant-garde filmmaker, and as the archivist’s instrument of restoration. The exploration of Ken Jacobs’ *Tom, Tom the Piper’s Son* also exposes the optical printer to the role of allowing co-construction between viewer/user and artist/archivist in utilising the notion of controllable time and space to mobilise perception and the body. This is done to constitute modes of retrieval to experience the multiple modes at work in constituting moving images and thus an experience within the world. Jacobs makes visible this mode of archival retrieval through his practice.

This chapter has looked at the ways in which we can begin to archive the un-archivable by presenting the optical printer as one model for retrieving the past: a past that extends beyond simplistic notions of origins and conceives of the processes of duplication and retrieval as anything other than benign elements of archival practice. The following chapters seek to develop the considerations of this archaeology and augment them with further practices of assemblage to consider an artistic archival practice.
Chapter Four: The Mnemosyne Radical Moving Image Archive

4.1 Warburg and assemblage

Returning to Ken Jacobs’ Tom, Tom, the Piper’s Son (1969), which was explored in Chapter Three, the audience is drawn into an excavation of early filmic form. Jacobs’ structured reanimation and exploration of the 1905 Bitzer film of the same title, models one form of artistic intervention with the archive. Some of the strategies and themes of Tom, Tom, the Piper’s Son resonate within this chapter. This chapter is concerned with the question: what is a radical moving image archive? Taking the implications from Chapters Two and Three, this chapter considers what constitutes radical moving image archival practice, particularly when we consider this practice artistic.

The implications so far have considered the optical printer as a model of the archive, which was presented through a media archaeology that conceptualised the apparatus through its activity. This modelling of the archive has facilitated an understanding of moving images as objects within the museum, archive, or gallery collection, and as film, photographic stills, press releases, movie posters, and an array of ephemera. The analysis of these objects, which was done through this thesis’s media archaeological approach, also sought to see the moving image as part of wider networks. These networks include those of copyright, paper, and war technologies and have material and immaterial aspects that are pronounced through their relations of use, mediated by bodies, and co-constituted by maker and viewer. We have also considered the context of moving images in relation to the notions of discourse networks and umwelt. This contextualisation was in order to gather together a formulation that could make intelligible what moving images are when considered within networks that perpetuate practices of meaning making. This loose assemblage or arrangement highlights the resistibility of moving images as always in flux and entangled within a
network of technological, cultural, political, and aesthetic considerations. What would then constitute a moving image archival practice? What would define that archival practice as artistic?

This chapter conceives of the challenge of a speculative archival practice: the *Mnemosyne Radical Moving Image Archive*. This practice postulates an approach that builds upon Warburg’s Mnemosyne Atlas by utilising it within a moving image context. It departs from Warburg by bringing it together with the knowledge garnered so far in this thesis. The *Mnemosyne Radical Moving Image Archive* is an approach that aims to strategise the concerns previously articulated around retrieving the irretrievable as a facet of archiving the un-archivable. The approach considered brings to bear earlier considerations (1) of the relation of one image to another and (2) of the moving image in a given context of making, viewing, and storing, which is constantly being re-imagined and negotiated as we experience reality through and with technologies.

This concept of the *Mnemosyne Radical Moving Image Archive* is explored here by building upon the art historian Aby Warburg’s approach to the *Mnemosyne Atlas* project, particularly through the concept of assemblage. The *Mnemosyne Radical Moving Image Archive* utilises Warburg’s approach as one model in a number of strategies that attempt to read the image contextually in multiple aspects through its techniques of assemblage, comparison, and disjuncture. Warburg’s work is outlined in this chapter and is recast here as the *Mnemosyne Radical Moving Image Archive*, which attempts to take images and sequences from moving image works to problematise traditional film studies categories of the moving image as form, auteur, spectator, nation, etc. to assert other potential relations amongst the works.

The first speculative archive is compiled through the use and exploration of a strand of moving image works, which are grouped together within a context of political and aesthetic discourse. This context includes works such as the structural and
structural/materialist practices and the Brechtian cinema of the ‘70s, which Wollen presents as the “two avant-gardes” (Wollen, 1975). The strategies of these approaches bring to the fore similarities of a specific articulation of how moving images come to have meaning through primarily materialist concerns. Through utilising the Mnemosyne Radical Moving Image Archive as a problematising filter, other considerations of meaning making come to light. These considerations include the concern for action and presentness and how they can be attributed beyond the immediate devices of the makers’ practice, drawing on a wider discourse of technology and technologies. This is understood when the practice is conceived of as a co-constitution of filmmaker, material, and viewer. The practice also brings to light other concerns that speak to wider cultural, social, aesthetic, and political concerns.

In the second account of the Mnemosyne Radical Moving Image Archive, the work of Annabel Nicolson is explored to consider one problem of the archive: the constitution of histories of the other, such as the role of women in moving image practice or the representation of black people in the media, as within the work of the Black Audio Film Collective (reflected upon in the introductory chapter). Specifically, the Mnemosyne Radical Moving Image Archive also acts to accentuate what an ethic of the image is when constituted in practice through a strategy of concern for the image’s relation to itself and others. What is placed where, in which relationship, and for what duration in the Mnemosyne Radical Moving Image Archive constitute an umwelt of artist–viewer–material. The Mnemosyne Radical Moving Image Archive offers an ability to filter and activate archival material in concert with its viewer and user. The archive is engaged not to fix notions but rather to unfix – to allow multiplicities that through the context of the user’s frame are bounded by ethical considerations.

The Mnemosyne Radical Moving Image Archive begins to answer the question of why it is important to recover the network and therefore the practices that have been
the focus of the previous chapters. The implication of the strategy of the *Mnemosyne Radical Moving Image Archive* is to illustrate how through an active use of the archive, viewers as users are able to creatively co-construct elements of cultural memory. That is, in conceiving of archival practice in this way, a strategy is constructed that alleviates a burden on the archive to hold every occasion and every example of a moving image. The *Mnemosyne Radical Moving Image Archive* negates the conceit that what is visible is all that is stored; rather, it augments Kittler’s assertion that it is with the digital and optical media that human agency is relegated (Kittler, 1999). Instead, human agency is implicated in co-constituting the archive in the acts of storing and retrieving. The practice explores continuities and discontinuities of the discourse network of the optical. It relates a reading of Warburg’s notion of how cultural memory persists through the visual. Thus, it realises a practice whereby the archive acts as an active instrument in coproducing the multiplicity of memories and meaning that are available through moving images.

This *Mnemosyne Radical Moving Image Archive* acts as one strategy that is contingently viable for thinking through how we experience moving images. The archive acts as a further technology that when seen as a network can recover and open up new ways, rather than close off pathways, for our understanding of how we experience reality. What is implicated in the use of the *Mnemosyne Radical Moving Image Archive* is a particular model of technocultural technique that can be applied to archival practice and aims to overcome the divide between image and apparatus. Other approaches to technology and the archive include those that utilise computational processing to explore the archive. For example in the work of the media art collective Constant, who utilise computational processes to explore archives, such as with their work on the archive of artist-engineer Erkki Kurenniemi (Cox, Malevé, and Murtaugh, 2016). Another approach would be that of Harun Farocki and his film works, which
attempt to create a “cinematographic thesaurus”. Similar to Warburg’s approach, his challenge is to collect film historical gestures, such as those of faces and hands (Farocki and Ernst, 2004). The various strategies of resistance, alongside those that are characterised as the dominant modes of producing, receiving, and storing, are qualified in the *Mnemosyne Radical Moving Image Archive* by the two notions highlighted at the beginning of this chapter: the relationship of one image to another and the context in which images are made, viewed, and stored. Moving images in this context are always being read, stored, and retrieved as a co-constituted experience. This is the problematising and radical imperative of the *Mnemosyne Radical Moving Image Archive*.

The chapter suggests that in thinking through what could constitute moving image archival practice as artistic practice, three outcomes come forth. (1) In the process of utilising the archive as an instrument for lived experience, it opens it up to possible futures; invisible histories; and technological, cultural, and historical imaginaries. (2) The *Mnemosyne Radical Moving Image Archive* is a practice that utilises assemblage. (3) This practice has repercussions for notions of re-use, including the consideration of the digital as an aspect of technological development and the consideration that an ethic of images is essential in understanding the relations of images and the process of meaning making within moving image practices.
4.2 Warburg’s *Mnemosyne Atlas*

What is Warburg’s method? How can it help us to understand and utilise the archive? In looking at moving image archives through the practice of duplication, the previous chapters have considered the notion of the moving image archive as an instrument and apparatus. However, whilst a media archaeology of the optical printer offers up the possibility of a model for the moving image archive, it still represents that model as an interrogation by means of the activity but not of the content. That is, whilst the archaeology of the optical printer elaborates a process of how we come to make meaning through the co-constitution of material, filmmaker, and viewer, the model it presents is one of practice, not of the content of the image. The model does not offer up an understanding of the approaches to meaning making beyond the discourse network or the specificities of “film as film”. How can we begin to understand meaning making in moving image work beyond Kittler’s relegation of the human to merely an inscription surface? In doing would it facilitate an understanding of the image and the apparatus together?

The work of art historian Aby Warburg, in particular his 1927 project the *Mnemosyne Atlas*, offers a strategy that further elaborates the moving image archive as
an instrument through proposing ways in which the viewer can articulate meanings across different image works. Going beyond the singular instance, or singular film, Warburg’s assemblage approach in the *Mnemosyne Atlas* project can be said to foreground active and open meaning making. The *Mnemosyne Atlas* panels illustrated in Figure 18 show Warburg’s attempt to map the paths that give art history and cosmography their meanings. The atlas was made up of 63 wooden panels approximately one and a half metres by two metres. The panels, covered with black cloth, with nearly 1,000 black-and-white photographs and reproductions from books, magazines, newspapers, and other everyday sources, were placed on the boards and arranged according to different themes. The boards were photographed between changed arrangements, and the panels were numbered and arranged in larger sequences of groups of panels (Johnson, 2012: 9).

The first three panels acted as a form of index for the whole atlas. This index represented how astrological and geometrical images represent the different ways that the cosmos and the body corresponded in the Late Middle Ages and High Renaissance. Warburg, according to Rampley (2001), was concerned with how an artist “selects” elements of their art historical inheritance. In the case of the *Mnemosyne Atlas*, it was the elements of Roman and Greek antiquity that Warburg wanted to trace as a basis for Western European culture. Warburg sought to show how generations of artists would either sublimate or regress cultural symbols and motifs within their work (Rampley, 2001). For Warburg, astrology was one such sublimation into mythic allegories then into navigational aids, so he points to these elements in the beginning panels, which act as the index. The transmission of cultural memory can be traced through works of art that also convey the interplay of historical continuities and discontinuities. Warburg’s project moves beyond a simple exercise of moving between movements and accounting for flourishes and changes in style; rather, as Rampley notes, the *Mnemosyne Atlas*:
... traced the migration of classical symbols across space and time, charting the changes in function and meaning they underwent in the process. (Rampley, 2009: 275)

The atlas had become a popular structure in all forms of empirical science by the 19th century. It had moved from a book design that structured and organised geographical and astronomical information to one that, particularly in Germany, was used for any form of “tabular display of systematized knowledge” (Buchloh, 1999: 121-122). Buchloh notes that in the 20th century, the form had become more metaphorical with the decline of notions of completeness of knowledge. It was within this context that Warburg’s Mnemosyne Atlas acted to intervene against the notions of art history that had prevailed. Warburg’s project rather articulated a transgression against the established concerns of “form” and “description” of art history (Buchloh, 1999: 124). In his building of his library and in the Mnemosyne Atlas project, Warburg conceived of the notion of not just preserving traces of the past but in resuscitating them “artificially by means of the collection and the relationship created between texts and images” (Michaud, 2004: 36). For Michaud, Warburg’s Mnemosyne Atlas project attempted to substitute the transmission of knowledge for exposition:

In this great montage of photographic reproductions, Warburg substituted the question of the transmission of knowledge with that of its exposition, and organized a network of tensions and anachronisms among the images, thereby indicating the function of otherness and distance in understanding the past. (Michaud, 2004: 37)

Michaud’s analysis of Warburg’s method considers how his exposition of the figurative in Renaissance art overturned the traditional reading of the body at rest. Warburg elaborated how Renaissance artists were not discerning notions of stasis from the forms of antiquity; rather, they understood the tensions of the body in opposition to the ideal depictions. As Michaud puts it, Warburg replaced the model of the body as
sculpture with that of dance: from immobility to mobility (Michaud, 2004). It is also observed by Michaud that Warburg was operating at the same time as the development of moving image technologies at the end of the 19th century. These technologies were also moving from the observation of static bodies and motion to an animistic reproduction of bodies. Michaud’s assertion regarding the link between Warburg and cinema extends to the notion that cinema, like the atlas, does not merely represent things but also reproduces them:

The atlas, then, does not limit itself to describing the migrations of images through the history of representations; it reproduces them. In this sense, it is based on a cinematic mode of thought, one that, by using figures, aims not at articulating meanings but at producing effects. (Michaud, 2004: 278)

What is useful in Michaud’s attribution of the cinematic link in Warburg’s *Mnemosyne Atlas* is the notion of “producing effects”. This thesis does not attempt to follow the concerns of Warburg’s art historical analysis; rather, it is the animism and the assemblage principles that allow for the tracing of motifs and gesture, which are explored within this thesis’s subsequent illustration of Warburg’s method. Notions on what moving images are have already been formulated throughout this thesis in relation to a media archaeological conception. Warburg’s approach here is augmented with reference to a notion of *umwelt* in building a framework that understands both the analysis of the content and the roles played by the technologies and their attendant networks in posing a counterpoint to a universalising concept of the archive and the knowledge that is produced with it.
This section considers the following questions as a way of applying Warburg’s approach to moving images. Can Warburg’s approach offer a further elaboration of the model of the moving image archive as an instrument? Can we consider Uexküll’s umwelt in place of Warburg’s cosmology when thinking of the reproduction of moving images within the practice of the Mnemosyne Atlas? The structural/materialist moving image works of the London Film-Makers’ Co-op offered an early problem for this thesis in considering what is archivable in light of the institutionalising structure of traditional archives. Extrapolating from Warburg’s approach as outlined above and utilising it as a strategy with moving images, the illustrations in Figures 19–24 begin to explore the
notion of constructing an artistic archival practice. Utilising the example raised in Chapter Two in relation to what Wollen called the “two avant-gardes” (1975), this section of the chapter looks to address the problem as outlined in the introductory chapter of the thesis and Chapter Two concerning moving image works that seem to resist archiving because of their claims to oppose traditional modes of representation. The oppositional practices of these works seem to lose their effect when placed in the context of a traditional archive that frames work within its overriding notions of knowledge production and cultural meaning. By building upon Warburg’s approach, the following speculative practice in relation to avant-garde moving images will explore the visual motifs of avant-garde practices in order to expose their similarities and dissimilarities beyond contemporary art and film historical categories.

Wollen’s seminal article *The Two Avant-Gardes* (1975) attempted to highlight the artistic differences and distinct divergent histories of the prevailing avant-garde moving image practices post-1968 in the US and Europe. The two paths can be widely described as those that followed the practice of structural film “film as film” and those that followed the practice of the political film, which is concerned with realism and to a large extent narrative, utilising the main Marxist critiques. Political film, as it is most expertly expressed in Martin Walsh’s book *The Brechtian Aspects of Radical Cinema* (1981), relates to cinema that could be closely associated with a Marxist critique of capitalism and the dominant forms of cultural expression. Walsh articulates how filmmakers such as Jean-Luc Godard, Dusan Makavejev, Jean-Marie Straub, and Danièle Huillet utilised Bertolt Brecht’s concepts expressed in theatre and transposed them to the moving image. The list could also extend to the films of Peter Wollen and Laura Mulvey, or latterly filmmakers such as Harun Farocki and Pedro Costa, for their

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16 Jean-Marie Straub and Danièle Huillet made over 20 films together in a collaboration that spanned over 40 years, before Huillet’s death in 2006. They are often referenced in shorter form as Straub–Huillet or Straub/Huillet, which is the manner in which they most often shall be cited in this text, in line with Walsh’s articulation (Walsh, 1981).
overt critique of dominant modes and for their anti-establishment political critique whilst also utilising narrative. Walsh highlights how Brecht’s theories of anti-illusionist theatre were taken up by a group of avant-garde filmmakers in the 1960s. These filmmakers were also proposing anti-illusionist cinema that attempted to break the usual flow of action with humour, song, and other devices that made the audience question the tactics at work in the dominant forms of theatre and film. One of the main conceptions was in producing a critical distancing of the audience/viewer and the event. This distancing effect, through gestural acting, flattening the cinematic space, and questioning the cinematic form of expression, was an attempt to make the viewer actively question the nature of film and their own economic and social relations (Walsh, 1981). Political cinema in this sense was greatly influenced by the writings of Brecht, but it was not the only form of political oppositional practice that was developing at this time. There were feminist filmmaking practices within and outside of the avant-garde realm. Organisations in the UK, such as Cinema of Women and Circles, were concerned with supporting women’s moving image practice through workshops and distribution. The Other Cinema was set up in 1970: a non-profit distribution company and screening space for independent films (Knight and Thomas, 2011). These organisations, alongside individual filmmakers such as Peter Watkins, including films such as The War Game (1965) and Punishment Park (1971), advanced an approach that utilised fiction and documentary to question media representation and the political and social concerns of inequality, war, and injustice. The above highlights a variety of political and independent moving image practices, beyond making film, including distribution and exhibition, that were not linked to a Brechtian approach but could also be considered part of the avant-garde not addressed in Wollen’s critique.

Whilst Chapter Two outlined the main concerns of structural/materialist practice, it was also noted that Wollen’s critique fails to fully account for the numerous
practices of the avant-garde that did not fit his two-path scenario, particularly in relation to expanded cinema. In building upon Warburg’s approach and applying it to the notion of the “two avant-gardes”, what becomes apparent are the ways in which gestures and motifs persist across what is considered a divide, which can then be opened up to look at other works seeming to fall outside of this narrow categorisation. In noting these features of oppositional practice or radical practice, wider notions of how we experience moving images can also be observed. It allows the concern for such works and the archiving of them to go beyond the problem of seeing them as fixed categories within a given structure of art historical context.

The below articulates a practice utilising Warburg’s method in relation to the Mnemosyne Atlas. In revealing the ways in which this method can be developed alongside the modelling aspect of the archive, it will demonstrate a strategy that this thesis terms instrumentalising the archive as a form of artistic moving image archival practice. This instrumentalisation requires the assemblage of moving image materials, their animation through their placing in space in relation to each other, and the use of the techniques of moving image practice (such as playing and pausing), from which an exposition of their aesthetic gestures and motifs can be explored across multiple reproductions.

Working with moving images poses a rather different challenge to the singular images that Warburg was able to arrange and re-arrange on the cloth-covered boards. The first step in producing a moving image Mnemosyne was to collect a range of moving image works that are examples of but not restricted to the “two avant-gardes”. These works are identifiable with the notion of artists’ film and video. The films that were chosen were: John Akomfrah’s Handsworth Songs (1986) and Nine Muses (2010); Tony Conrad’s The Flicker (1965); Peter Gidal’s Clouds (1969); Jean-Luc Godard’s Tout va Bien (1972); William Greaves’ Symbiopsychotaxiplasm (1968); Malcolm Le
Grice’s *Berlin Horse* (1970); John Smith’s *Black Tower* (1985-7); Michael Snow’s *Wavelength* (1967); and Jean-Marie Straub and Danièle Huillet’s *Moses and Aaron* (1975). The selection reflects a consideration of Wollen’s “two avant-gardes” but also alludes to attempts to qualify and catalogue avant-garde film practices (Curtis, 2007; Hatfield and Littman, 2006; Rees, 1999; Walsh, 1981) in the UK, Europe, and North America. The list is indicative in that it selects some films and filmmakers who are familiar in relation to the notions of structural, structural/materialist, and political film whilst also looking at some of the subsequent movements of artists’ film and video, such as the work of John Akomfrah: a member of the Black Audio Film Collective.

*Handsworth Songs* was one of the earlier films directed by Akomfrah and produced by the Black Audio Film Collective, which was founded during the later workshop movement of the ’80s in the UK. The movement also saw groups such as the Sankofa Film and Video Collective (Fusco, 1988) set up with the aim of tackling issues of black and Asian representation in Thatcher’s Britain. The later work *Nine Muses* (2010) utilises archival stories of migrant journeys. Akomfrah’s style utilises the structure of a musical score as a form of visual structuring strategy, with the juxtaposition of images of landscapes and archival material. Greaves’ *Symbiopsychotaxiplasm* (1968) is an American film that documents a film crew filming a film crew attempting to construct a dramatic scene between a couple, whilst exploring what documentary is.

Conrad’s *The Flicker* (1965), Peter Gidal’s *Clouds* (1969), Malcolm Le Grice’s *Berlin Horse* (1970), and Michael Snow’s *Wavelength* (1967) are all examples of structural and structural/materialist filmmaking, highlighting the materiality and structuring qualities of film. Malcolm Le Grice’s *Berlin Horse* was elaborated previously in Chapter Two; *Wavelength* consists of a zoom shot within one room; *Clouds* presents the movement of a camera as it searches out a nothingness in the sky;
and *The Flicker* produces stroboscopic effects through alternating frames of black and white. John Smith’s *Black Tower* is a later structural/materialist work that employs humour, word play, and visual play in its critique of narrative and representation, concerning black towers in the landscape. *Moses and Aaron* is Straub/Huillet’s film based on the unfinished Schoenberg three act opera.

The grouping of films does not articulate every facet of these movements, but the selection opens up the conceit of the “two avant-gardes” to a wider critique of what is or is not included. The wider set of observations that can be garnered from the first iteration of the *Mnemosyne Radical Moving Image Archive* is further explored in the second part of this demonstration within the context of retrieving the un-archivable. The list represents just one assemblage: a beginning from which to analyse this notion of the “two avant-gardes” in order to illustrate how Warburg’s method can be augmented. It sets out an index from which further panels can be produced.

### 4.4 Moving image archival practice

The filmic works of structural/materialist and political film described above require multiple screens to be arranged in close proximity in order for the works to be viewed. As in Figure 19, the juxtaposition of frames in video players allowed for the simultaneous reproduction of the films all playing at the same time.\(^{17}\) This simultaneity

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\(^{17}\) The initial presentation was coded in Adobe Flash and then eventually marked up utilising HTML5. The general concept was to present a number of instances of video player that could be controlled and viewed with minimal ease whilst allowing for the greatest level of adjustment to basic elements, such as sound and play/pause controls. The flexibility that was developed using HTML5 meant that an open-source, non-propriety solution could be found to both produce and present multiple video instances. The use of computer coding as opposed to using film/video projectors or screens was generally a matter of convenience and flexibility. The use of the computer as a reproduction platform for moving images is not the focus of this thesis but rather extends certain questions that begin where this thesis ends. These questions relate in part to the limit of the archaeological standpoint of the thesis, an example of which is in Chapter Three: the digital developments that form part of the media archaeology of the optical printer, moving from photochemical to digital scanning. These considerations of duplication techniques and cultural concerns could be explored in future research.
of images also requires the ability to individually pause and play different players, allowing for the juxtaposition of frames and sequences in order to view similarities and dissimilarities within the images. The focus of this approach is with the image, to locate those symbols and motifs that seem to persist within these works or those images that are discontinuous and account for an altogether new gesture. This approach is, in a sense, ignorant of narrative impulse and goes beyond the narrow categorisations of the distinct paths of avant-garde practice suggested by Wollen. The approach for the most part addresses the visual elements of the frame in relation to the other images that form part of the panel environment, and for the purposes of this thesis is focused on images and not sound. The process in the first survey of works produced a number of panels, reflecting as such the first few panels of Warburg’s Mnemosyne Atlas in that they act as an index. Individual frames can be paused and removed from the flow of images and are then reproduced as still frames and screen grabs and placed on a single canvas as if on a board, mirroring Warburg’s panels.
Figure 20. *Structured and Structuring* panel, *Mnemosyne Film* (Amanda Egbe, 2012).

The first of the six index panels, shown in Figure 20, indicates the way in which shape and repetition form part of the visual motifs that resonate across these films. The camera repeats or searches out form and shape either from the viewpoint of the camera’s processes (such as the zoom) or through the manipulation of filmic processes (such as duplication with filters and through negative and positive processes). The structuring relates to the process of perception between the human eye and the filmic processes.
Figure 21. *Brechtian Stare* panel, *Mnemosyne Film* (Amanda Egbe, 2012).

The *Brechtian Stare* panel (Figure 21) reflects the distancing effect typical of the ways in which Straub/Huillet move away from classical narrative devices, such as identification through point-of-view shots. Walsh highlights this effect in Straub/Huillet’s film *History Lessons* (1972), where they “meticulously avoid any such fixing of the position of the spectator” (Walsh, 1981: 69). This form of framing becomes a distinct motif seen across a number of the films viewed, specifically where the presence of human bodies creates the potential for the illusory empathetic binding of viewer and subject.
The *Collectivisation* panel (Figure 22) highlights both the overt Marxist politics, clearly identified within the political cinema of Godard, and those characterised around the political film form of the “two avant-gardes”. These are depicted here with the workers in *Tout va Bien* (1972) and the chorus in *Moses and Aaron* (1975). The visual motif also points to the use of tableau. Walsh highlights that Straub/Huillet take on Brecht’s notion that film is by nature still, and he extols the virtue of expressing film as tableau (Walsh, 1981). The tableau as a visual motif was also considered in the previous chapter with Jacobs’ (1969) reworking of Bitzer’s (1905) *Tom, Tom, the Piper’s Son*. Jacobs’ structural interrogation of the film highlights not the latter avant-garde preoccupation with the illusion of movement as a central paradox within the moving image. It also, as with the early filmmakers, highlights the construction of meaning through the visual structuring of the image. This visual structuring was particularly in contrast to the notion of cause and effect, which came to be characterised as the dominant narrative mode. The use of tableau links the moving image to other forms, such as painting and theatre, encouraging the viewer to consider not only the historical construction of the image but also the signifying practice at work. These strategies act as distancing effects so as not to engage the audience in forms of emotional identification (Walsh, 1981). Rather, for the viewers the strategy allows for consideration of the social and political relationships amongst themselves, the characters, and the social conditions therein.
In Figure 23, the *Landscapes* panel develops further the notion of perception introduced in the *Structuring and Structured* panel. Landscape is utilised here as a theme to bring about a critique of spatial representation, nature, architecture, and perspective in general. The viewer, in dominant modes of filmmaking, is in the classical viewing position, articulated most notably with the notion of the vanishing point, as characterised in Chapter One with the account of the panorama. Within the avant-garde, this fixed position is traversed by critiquing the act of viewing through recourse to the apparatus of the moving image. This includes the use of panoramic shots, long takes, and zooms. These are all strategies to mobilise the viewer to consider the notions of perspective, the recording device, the human, and the representation that is prevalent in dominant modes of perspective as the viewer watching a subject or object. The approach employed here is a form of structuring, which as Turim suggests is a structuring of absence – of “classical representation” that opposes, modifies, and at times maintains to go beyond formal representations into a “play of figural space” (Turim, 1985: 108).
The penultimate panel (Figure 24) points to making visible the production of representation through the display of the apparatus. Whilst other strategies of making apparent, as in the structural/materialist sense, may highlight the materiality of the film itself – the display of sprocket holes, negative and positive printing effects, scratching, and drawing and placing objects directly on the film itself – the Visible Camera motif attempts to confront the viewer with the process of representation. What is highlighted is the process by which representations of the moving image are constructed and framed, pointing to notions of perspective and power being determined by who has access to the means of production. The inclusion of the apparatus here acts as a gesture of resistance against the processes by which the dominant modes of production in Hollywood and elsewhere obfuscate and render invisible the methods, means, and social relations involved in the production of the image.

The final panel, Figure 19, which was indicated at the start of the discussion of the Mnemosyne Radical Moving Image Archive, elicits an exposition through images of one particular dissimilarity. In this figure, the visible and invisible motifs are juxtaposed to consider how these gestures may resonate with each other or with other images. Whilst the previous panels may show similar styles or strategies, it is also necessary to articulate moments of difference, which may also help to articulate possible or potential unperceived connections or to assert new motifs. The panels as a whole point to a number of motifs and gestures that are reflected visually across the works of what are
characterised firstly as the “two avant-gardes” but extend to a whole corpus of works that go beyond those two distinct paths outlined by Wollen (1975). This first survey acts as in Warburg’s index panels: to look at the visual motifs that persist across the works and to reflect the wider concerns of what moving images are. What is illustrated here is the ways in which the oppositional practices of moving images can be construed not only within their narrow confines as art historical movements but also in light of and not distinct from the wider media archaeology method that has been presented, notably in the previous two chapters in relation to the optical printer.

Moving images in this thesis are situated within the discourse network of the 1900s, in the context of the observer/subject as postulated by Crary (1992), and, by utilising Warburg’s approach, a similar epistemic concern is noted. Warburg’s iconology is an approach whereby, as Rampley suggests, he is looking at the interplay of continuities and discontinuities of a given age: a precursor to conceptions of culture as a “discursive space” (Rampley, 2001). Warburg sees in his studies of Botticelli a discourse of antiquity, whereby the cultural milieu of the time can be understood, but he goes beyond a systematic fixed network of connections and rather seeks a “dynamic process” beyond a web of “horizontal relations”. As Rampley puts it, Warburg is concerned with a historical axis (Rampley, 2001: 306), whereby his approach could go beyond the motifs that were traceable in a given epoch or cultural space, cutting across those spaces. Through the ways in which artists select certain motifs and gestures of antiquity, works of art act to transmit cultural memory; that is, the work of art as memory is an archive or, as Rampley corrects the postulation, memory is here rather a process of construction (Rampley, 2001). This corrective by Rampley allows the notion of archival practice to be foregrounded as praxis: a dynamic process of construction, rather than static, fixed connections that are stored. It is in this sense that Warburg’s method can be utilised within this thesis.
In Warburg’s early Mnemosyne images, the indexical panels traced cosmological signs, highlighting the relationship between the cosmos and bodies. For Warburg, the distance between the self and the external world revealed consciousness.

In this artistic act between “the imagination’s act of grasping and the conceptual act of observing, there is the tactile encounter with the object” – this encounter is reflected in the artwork and so can be traced (Warburg and Rampley, 2009: 277). Warburg’s metaphorical notion allows for an encounter with the object that intuits both the material and immaterial aspects. However, as argued previously in Chapter Two, the notion of umwelt qualifies the relations of objects and subjects by positing an environment where there is an evolution of the subject with its environment. By augmenting Warburg’s cosmology with the notion of umwelt, a richer account of the environment, its objects, and the “signalling perceptions” (Sagan, 2010) becomes available for analysis. The notion of a cosmology of images thus transforms into that of an umwelt of images.

In combining Warburg’s approach with that of discourse networks, the notion of the archive as illustrated above sees cultural memory as a dynamic process. In searching out the motifs and gestures across a particular context of moving image practice, namely that of avant-garde practice, it becomes possible not to see the approaches of structural/materialist and political film as isolated. These oppositional approaches show visual elements of continuity and discontinuity across moving image practice. They extend beyond early cinema and pre-cinematic moving image practices, not least across the perceived divide in experimental and avant-garde practices. The Mnemosyne Radical Moving Image Archive in its assemblage of images also refers to the concern for moving image relations outlined in the chapter introduction: that is, the affective dimensions between one image and another. The assemblage of images evokes a wider network of moving image technologies, including those of early cinematic and optical devices that produced differing effects through their conception of producing the
illusion of movement. The flipbook, zoetrope, and magic lantern, amongst others, as expressed in Chapter One, produce an observer whose vision is no longer fixed, and the body is enmeshed in the mobility of images. The optical printer as a model of the archive also represented that model of praxis that through its various reproductive and manipulative techniques could embrace these effects, which are further explored in the second illustration below.

The *Mnemosyne Film* panels (Figures 19–24) propose themselves as an index to think through the considerations of avant-garde practice. The first concern is how to archive these works, such as the structural/materialist films that seem to become re-imbued with the institutional concerns that they attempted to overcome. This is alleviated through the first assemblages of the *Mnemosyne Radical Moving Image Archive*. In the first assemblage, the index alleviates this first concern by adjudging the images within a more dynamic context of what strategies are repressed or sublimated as gestures and motifs of oppositional practice. Seen in the company of a body of moving images (an *umwelt*) and in relation to a wider network, these film works do not take on so easily the institutional concerns that framed the articulation of the archive in this thesis’s introduction. The film works become animated rather than static objects of a wider knowledge production that has the notion of the modern museum as its overriding explanatory principle. Rather, a dynamic account of the works can be ascertained through a moving image archival practice that utilises this thesis’s approach to Warburg’s *Mnemosyne Atlas*.

This moving image archival practice, however, does not account for those elements of moving image works and practices that do not find their way to the archive. One conception of the un-archivable that was attributed to works that resist dominant modes of representation has been alleviated, but not the problem of those works that resist the archive. These resisting works were never stored or are no longer available
within the archive because of their ephemeral nature. The next section looks at how we can begin to address this problem through considering the elements of moving image archival practice as outlined above more closely, combined with the notions of retrievability that were discussed in Chapter Three.

4.5 Moving image archival practice as artistic archival moving image practice

This next section considers the following question: how can we conceive of artistic practice in relation to moving image practice? In considering how we can begin to address the presumed gaps within the archive, the notion of umwelt helps to resist a tendency for an all-encompassing perception. If we return to Wollen’s “two avant-gardes” proposition, one of the criticisms of Wollen’s approach was formulated in Hatfield’s articulation that his précis of the moving image avant-garde left out many practices and approaches that did not fit so neatly into his categorisation. This particularly related to expanded cinema and narrative (Hatfield, 2003). Expanded cinema practices, those practices that use (for example) multiple screens or performance, have been historicised and articulated in attempts to catalogue the avant-garde either nationally or internationally, for example in Sitney’s Visionary Film (1979) or Curtis’s survey of international and British avant-garde and experimental film practices (1971, 2007).

There are critical historical analyses of expanded cinematic practices that attempt to address how these relate to the wider artistic avant-garde and to moving image practices that overlap with other art forms, such as music, performance, and computing (Youngblood, 1970). Other analyses offer a critique of these art forms’ relation to the avant-garde with concern for concepts such as site specificity (Uroskie, 2014) and narrative (Rees et al., 2011). Expanded works offer less of an opportunity for archiving because of their cross and intermedia aspects, particularly relating to
performances, as these are ephemeral in nature. Works that were conceived to be performed and never to be stored resist the archive in that artists can limit or refuse the documentation of a work. The introduction of this thesis outlined strategies for coping with this problem through archiving strategies such as the Variable Media Questionnaire (Ippolito, 2003) and the Media Art Notation System (Rinehart, 2007). Whilst these approaches do much to address the categorisation for the collector, they re-inscribe text as an articulating force for retrieval and do not rigorously speak to the visible and invisible representations and practices that such works attempt to address.

If we consider the work of Annabel Nicolson, a member of the London Film-Makers’ Co-op, it often expresses many of the structural/materialist concerns outlined above, such as the materiality of film. In films such as *Slides* (1971), found pieces of objects from the artist’s studio, 8mm and 16mm film fragments, sewn pieces of film, and strips of film slides were handheld in a contact printer to produce the resulting 16-minute film. However, her work is also exemplary of expanded and performance work, which extends her filmic practice into other terrains. Nicolson resisted her work being documented (Sparrow, 2005) and therefore there are few examples of her expanded work within any archive. The traces of her work persist in the limited documentation that is available from photographs and oral and written accounts of performances. Her work therefore resists the archive, as a distinct choice of the artist, and because of the nature of her works being temporary and ephemeral in nature, they can thus be deemed un-archivable. As a founding member of Circles, a women’s film distribution organisation set up to facilitate support for women’s artistic output, Nicolson’s work also points to a concern for the representation of women’s artistic practices. The exclusion of women, ethnic minorities, and other communities from the archive persists as a complex interrelation of concerns, as alluded to in the introductory chapter, and is expressed in the interventionist practices of artists such as the Otolith Group. The
Ghosts of Songs (2007) retrospective of the work of the Black Audio Film Collective, who themselves are intervening with the archive concerning the representation of black and Asian people, was an attempt to recover the work of black and Asian artists within art, film, and cultural history. Nicolson spoke and acted out, as did others, about the marginalisation of women in the avant-garde movement. The lack of female representation, both historically and specifically in the case of the Film as Film (1979) exhibition at the Hayward Gallery, was highlighted by the refusal of the few women involved in the exhibition committee to exhibit their works without commenting on the discrimination that women artists have faced; instead, they made the below intervention:

For many reasons and with the support of women not officially involved in the ‘Film as Films’ committees they have decided to withhold their research and leave this gallery space empty.

This is our statement:

The gesture of withholding our work and the presentation in its stead of a statement of opposition is the only form of intervention open to us. It was impossible to allow the Arts Council to present our work as if there had been no struggle, as if it had been nurtured in the spirit of public patronage.

Informed by a feminist perspective it was our intention to begin a re-examination of the historicised past by introducing (welcoming) Alice Guy and re-presenting Germaine Dulac and Maya Deren. (Nicolson et al., 1979: 118)

To consider the un-archivable is also to consider the structural forms of inequality and discrimination that marginalise not only the ability to make work but also the ability for that work to be seen. It is with this in mind that in a further exploration of Warburg’s approach, combined with the strategies of moving image practice ascertained in the previous chapters, a further Mnemosyne Radical Moving Image Archive is produced. A seminal piece of work by Nicholson that resists the archive, Reel Time (1973), a performance with projectors, exists in the archive as just a few photographic documents and written accounts. In further augmenting Warburg’s approach, what
becomes apparent are the ways in which visual gestures and motifs can be read alongside the notion of time-axis manipulation. This approach of time-axis manipulation renders effects of the relations amongst images, as posited above, as a strategy for co-constituting a moving image archival practice. The optical printer as a model of the archive offers up the possibility, through its forms of duplication and thus dynamic retrievability, for realising the material and immaterial aspects of what seems irretrievable.

![Image of Reel Time by Annabel Nicolson](image)

Figure 25. Documentation of *Reel Time* by Annabel Nicolson (1971 and 1973, Luxonline and Patti Gaal-Holmes).

*Reel Time* (1973), as documented in Figure 25, is a performance with two film projectors, two screens, Annabel Nicolson, an audience, and a sewing machine. One projector casts a shadow of Nicolson onto a screen as she sits in front of a sewing machine. The other projector begins to project a black-and-white film of Nicolson operating a sewing machine onto another screen. As the film loops through the projector, it is sewn by Nicolson with the sewing machine. The film gains additional holes, scratches, and dust as it passes once more through the projector, continuing until it can no longer be threaded through the projector. Nicolson breaks to mend the film and to attempt to thread the loop back through the projector and sewing machine, all whilst chosen audience members at intervals read through two instruction manuals on how to thread a sewing machine and how to thread a film projector (Sparrow, 2005). The
description is provided by Felicity Sparrow, who also articulates the feminist concerns of the performance, particularly in relation to the use of the sewing machine:

The Singer sewing machine (invented some 45 years before the Lumières’ cinematograph) is both a familiar household object and potent symbol of women’s hidden labour in the home and in sweatshops; by contrast the film projector, traditionally hidden above and behind cinema spectators in a closed-off box and operated by male projectionists, symbolises a vast male-dominated entertainment industry. That these two differently gendered machines could be thus linked was at the time revelatory, anticipating future ground-breaking work by feminist art practitioners. (Sparrow, 2005: 2)

Sparrow’s commentary points to the invisibility of women’s work but also points to the interconnectedness of both the means of production in terms of the technology, whether the sewing machine or the film projector, and the process of creativity. The work garners its meaning in making visible its processes in combination with its audience. To consider Reel Time within an archive requires the storage and retrieval of the above concerns within the archival practice.

To develop the ideas of the moving image archival practice illustrated above, utilising Warburg’s approach, the selection of panels created act as our index, whilst we can subsequently begin to store Reel Time as a reproduction. This storage and reproduction take on the form of duplication that was considered in the model of the archive illustrated through the optical printer. It also aims to understand this work in combination with a wider network and semiosis, as inferred in the work of von Uexküll (2010).
Reel Time Panel 1, as with the earlier panel constructions, shows a selection of static images alongside a video player. At the top of the figure is a set of images from the Visible Camera panel, which act as an index for reading the accompanying images. The static images represent part of the constructed umwelt of the performance of Reel Time (Nicolson, 1973), which is presented with a reproduction of an image documenting a performance of the piece to the right of the video player. The bottom still image is a reproduction of a frame from Malcolm Le Grice’s film Little Dog for Roger (1967), whilst the other static image is from Annabel Nicolson’s film Slides (1971). Slides is also used as the source of the video player, which is the central image; as with the other images, it acts as a cue and resource for articulating the elements of Reel Time that are not viewable. Rather, as the umwelt alludes to, it hints at and prompts notions of the invisible. Like the spider’s web in von Uexküll’s proposition, an imaginary fly is proposed through this construction, and in this Mnemosyne Radical Moving Image, the assemblage of images is used to construct an imaginary dimension
of the performance. The wider network is understood through the index images and the landscapes that are reflected back as a loop between the moving image of the video player and the static images. The index images in the above panel point to the motifs and gestures of visibility and representation, of technology and power relations. They reflect upon the static image of documentation: Nicolson framed by the projector behind the sewing machine. The attendant static images reflect the material concerns. *Slides* used its tactile reference to material objects to make moving images and fragments of still and moving images with sprocket holes and scratches. So, to the reference to *Little Dog for Roger*, this film reflects the wider aspects of structural and structural/materialist practice but also the personal themes that are reflected in both Le Grice’s and Nicolson’s work.

![Figure 27. Reel Time Panel 2, screenshot (Amanda Egbe 2016).](image)

*Reel Time Panel 2* (Figure 27) shows another panel, which, like the previous one, is a screenshot from the constantly playing video of *Slides*. This constitutes a moment of pause from the flow of moving images in which to reflect and analyse the gestures that become amplified as the images are animated through their spatial
connection within the environment of the panel. In combining a technique that allows for frame-by-frame analysis, such as with the optical printer, the above approach allows the possibility to reproduce moments in their material and immaterial aspects. The relationships of images no longer concern a singular film but rather are extended to its wider network: firstly, within the context of avant-garde moving image practices and concerns and, secondly, within other motifs and gestures that can be zoomed in on. The panel above pauses on a woman’s face, linking the personal with what is visible. The possibilities for meaning include notions of representation and memory. The multiplicity of meanings become alive to interpretation through the activity of the user in concert with the filmmaker: pausing and replaying the moving image. As with the spider’s web, these activities are at counterpoints: they are differing worlds that do not share a point of view. Rather, they express an environment. Thinking back to Ken Jacobs’ approach, his careful performative examination of *Tom, Tom, the Piper’s Son* (1969) with projector and camera is alluded to here. The process by which the viewer utilises the materials (effecting a slow zooming in and out and manipulating the time axis) arrests and sets in motion the possible motifs and gestures from the very performance that seems un-archivable.

Returning to the still image of Nicolson behind the sewing machine, her shadow projected onto a screen, the image is animated by the movement and gestures of the surrounding images. As proposed earlier in the chapter, the dynamics of the assemblage produce effects that resonate with the wider network of moving image technologies and concerns: a retrieval rather than a recovery that is co-constituted by user, material, and filmmaker producing a set of meanings. *Reel Time* evokes, as Sparrow (2005) points out, the technological link between the sewing machine and the film projector in her essay on Nicolson. Arguably, what becomes visible in Nicolson’s work is the effect of these technologies on a phenomenological level, as well as our experiences of
technology in social relations, including those of gender. What can also be discerned in this co-constitutive approach to archival practice as artistic practice is not only an examination of a particular piece of Annabel Nicolson’s work but also an articulation of her creativity, which is perceived in the gestures and motifs that become animated within this approach.

The above *Mnemosyne Radical Moving Image Archive* posits an approach to the archive whereby the viewer becomes a user in that they must take a creative and active approach to the archive to perform the activity that Warburg’s *Mnemosyne Atlas* could only allude to. The archival practice in the above examples makes resonant the notion of memory as a productive construction and how the utilisation of strategies and approaches that adhere to the assemblage of moving image practice offers the possibility to instrumentalise and thus retrieve what seems irretrievable and un-archivable.

These notions of the un-archivable and irretrievable were considered in the previous chapters through the media archaeology of the optical printer as a model for the archive. The illustration of moving image archival practice becomes an artistic and radical enterprise, as is suggested here. The user’s creativity and imagination, the material, and the makers co-constitute a state of reality, in that they select or repress one of the many possible experiences, gestures, and motifs that become available through the process of artistic archival practice. The illustrations of the method in this chapter do not fully expand the strategies that are made available by the optical printer as a model of the archive. The illustrations point the way to a moving image archival practice that negotiates moving images as static and moving instances from which a manipulation of the time axis can allow the zooming in and out of images, the assemblage of different reproductions, and the use and re-use of different indexes. The manipulation of the time axis in this sense refers to the earlier concern for how images relate to each other as an
archaeology of moving images that includes optical illusions, early cinematic assemblages, and pre-cinematic assemblages. A further rendering of this *Mnemosyne Radical Moving Image Archive* is beyond the scope of this thesis at this time, as the above methods are illustrative rather than exhaustive; however, the approach offers possibilities for further research. The strategies outlined here help to provide a way of navigating meaning and memory as a productive process, thus achieving a notion of the archive as always in flux through being co-constituted through the interactions of user, material, and filmmaker.

In considering the above approach to moving image artistic archival practice, additional attention can be called to the shift of the viewer to user, as suggested in this chapter. Attention is also called to how these images are constituted within an *umwelt*. In conceptualising the *umwelt* in relation to a discourse network of the optical and a history of technology, as posited in Chapter One, there remains a question of how to select images. The use and re-use of images raise the concern for an ethos of moving image artistic archival practice as problematic.
Conclusion: Radical Moving Image Archival Practice

This chapter reflects upon the implications of the research *Notions of a Radical Moving Image Practice as a Problematic*. The research posited the *Mnemosyne Radical Moving Image Archive* as an artistic practice that alleviates the concerns about archival practice and moving image works that were outlined in the introductory chapter. These concerns, namely the perceived burden on the moving image archive to store and preserve all moving images, were articulated in this thesis by the problem of archiving the un-archivable. This chapter will draw out further conclusions on how the problem was conceptualised through a media archaeological methodological approach. This approach was enhanced by the notion of assemblage, building upon Warburg’s strategies in relation to the *Mnemosyne Atlas* project (Rampley, 2001) and von Uexküll’s notion of *umwelt* (von Uexküll, 2010). The resulting *Mnemosyne Radical Moving Image Archive* sets out the archaeology as extending into artistic practice. This chapter will reflect on how this opens up further problems, such as wider ethical considerations in relation to the re-use of moving image works, and offers up the potential for further research in developing the *Mnemosyne Radical Moving Image Archive*.

5.1 The un-archivable: Conceptualising the archive

Returning to the still image from the introductory chapter (Figure 1), the still from my 2009 two-screen installation project *Life in Peckham* (Egbe, 2009) was a starting point for an inquiry into how artists are working with archive materials and why their work is subsequently the subject of archiving.
How artists work with moving images and the archive has been a source of the illumination of critiques of archival practices, as well as a form of investigation of the archive. These critiques can be outlined as follows. (1) There is a concern for the material deterioration of moving images within the archive; the found footage work of filmmakers such as Gustav Deutsch with *Film Ist* (1998), as outlined in the introductory chapter, and Bill Morrison with *The Film of Her* (1996), noted in Chapter Three, highlight the fragile nature of the materiality of film. (2) There is a critique of institutional practices, which can be seen in the approach of Cummings and Lewandowska in their *Enthusiasts Archive* (2006). This work, noted in the introductory chapter, shows an artistic intervention in the recovery and exhibition of amateur film works. The project therefore posed a challenge to the notion of official histories, juxtaposing them with the history of the amateur by framing such work within a context that makes palpable how and why these reclaimed Super 8 films of Polish amateur filmmakers came to exist. (3) Un-archivable works are a facet of ephemeral works that were never meant to be preserved or even documented, as with the case of Chapter Four’s Annabel Nicolson’s *Reel Time* (1973): a work that was conceived for performance and which the artist resisted being archived, save for the few photographs and oral accounts. The introductory chapter highlighted the efforts with projects such as the Variable Media Questionnaire (Ippolito, 2003) to find more-flexible ways to
preserve and document ephemeral works. The nature of the ephemerality may differ: for example, a work may have no object as its output, such as performance. Alternatively, because of the likelihood of technological obsolescence, the work must be stored in relation to it being simulated on a different platform.

The above considerations overlap with (4) a broader critique of what is or never was archived and of the political, social, historical, and cultural role of the archive. The work of the Otolith Group in presenting the retrospective *The Ghosts of Songs* (2007) the work of the Black Audio Film Collective raised questions of the role of the historical document and the archive. Particularly concerning questions of representations, which are also facets of all the above examples, despite a focus on the three previously highlighted critiques. Artists’ interventions with the archive present a body of work and a set of strategies that critique archival practice. It is this form of inquiry into the archive that this thesis brought into dialogue with wider bodies of knowledge concerning the moving image and archival practice. These critiques formed a basis for defining the archive through identifying where the problems lay. The concern for archiving the un-archivable thus became a strategy for framing the research into moving image archives in relation to artistic oppositional practices. These practices shed light on the problems of archives and archiving. Looking from oppositional and radical approaches at the perceived dominant modes becomes a critical device in opening up notions of moving image practice, as well as what constitute archives and archival practice.

**5.2 Archaeology and archival practice**

What moving images are was also an early problematising aspect of the thesis. Attempts to digitise moving images, such as the large-scale project to preserve and make accessible the archive of the National Review of Live Arts at the University of Bristol,
as noted in the introduction to the thesis, point to how technology opens up a set of additional concerns about what is being archived. Fossati (2009) commented that the digital world challenges what we understand as film. This problem was considered in the introduction through looking at the variety of ways in which we have come to experience moving images. When we consider the relationship of one image to another in contemplating moving image, a variety of apparatus come to mind: from flipbooks to online streaming. The variety of technologies overlap and diverge; they disappear and seemingly reappear as new and as innovations. To understand moving images beyond just the notion of cinema as a single-screen auditorium experience, it was necessary to build a methodological approach that could account for a non-linear critical history of moving images.

New film history (Elsaesser, 1986) and media archaeology and its variants (Strauven, 2014; Parikka, 2012) present a critical approach to media history. The intervention that occurred in film studies following in part the 1978 FIAF conference in Brighton saw early cinema revisited in order to assess the assumptions on the origins of film. What Elsaesser (1990) and Punt (2000) point to in their accounts of this turn are the new approaches to history that occurred outside of film studies alongside the new archival evidence that was made available. Incorporating the wider cultural environment allowed for a thicker analysis of the conditions for invention and innovation. This saw technologies that are considered key firsts in teleological accounts, such as the Kinetograph and the cinematograph, considered in light of the milieu of amusement and fairground attractions. The analysis allowed a move away from a linear progressive model of the technologies of cinema. This model which sees individual inventors and great directors herald finessing a naïve technology into the finished media form of cinema auditorium and classic Hollywood narrative films. This more critical approach of new film history was able to question the accounts of narrative film being the
pinnacle of filmic form, through an analysis of the films that were considered “primitive” (Gunning, 1989). This analysis highlighted the alternative approaches to a visual expression that seemed immature. Particularly, if considered as a necessary step to the linear editing techniques of most film and television today, and not considered in light of the other expressions of entertainment that were occurring at the same time.

Méliès’ film works exemplify this wider milieu in that he saw moving image technology as a way to satisfy his audiences, which were accustomed to illusion as entertainment. Similarly, the tableau effect of Tom, Tom, the Piper’s Son (Bitzer, 1905), as noted in Chapter Three, is not a primitive precursor to cause-and-effect editing but rather its own style. A style which related to the audience’s responsiveness to other forms of artistic expression, such as painting and nursery rhymes.

New film history also has an influence on the wider media archaeological approaches that garner influence from Foucault’s archaeology (2002a, 2002b) and Kittler’s media theory (1990, 1999). In reviewing the literature on media archaeology, as in Chapter One, the case-by-case application of media archaeology becomes apparent. There are media archaeologies with differing approaches, which account for different types of objects under scrutiny, with differing focuses. An example is Oliver Grau’s (2003) account of the panorama, which was picked up in Chapter One, with its focus on understanding new immersive technologies. Grau’s account concerns a different set of interests to those of Huhtamo’s (2013) account of the less-well-known moving panorama. The work of Chapter One was to illustrate where media archaeological approaches were pertinent to this thesis and where these approaches needed supplementing. Media archaeological approaches tend towards an analysis of technology and apparatus. This approach unlocks a wider discussion of technologies beyond the linear models of continued innovation from precursors (primitives) to the perfected technology. Media archaeology has often been criticised for its technological
determinism, particularly in the case of Kittler’s theory of media. As noted earlier in the thesis, Kittler sees technological media as relegating human agency: a concern that was elaborated on in Chapter Two. In this thesis, the approach to media archaeology was to address this tendency towards technological determinism through a wider consideration of the networks of technologies that interrelate. It also included a consideration of the roles of users and viewers within it. In effect, the work that new film history has done to consider the wider cultural environment of moving images had to be included in this thesis’s approach to the archive and moving image practice. Punt’s (2000) work on the exchange between science and entertainment also considered the role of the public in the development of cinema. It is necessary in the account of the moving image archive to consider the roles of those users and viewers who seem to fall outside of the immediate determinants for archival practice. It is with this assertion that this thesis sought in the optical printer a valid object from which to articulate a model of the archive.

The optical printer is utilised not only as an apparatus in the archival process, as a preservation and restoration instrument, but also within special-effects departments and studios to render illusions. In the London Film-Makers’ Co-op of the 1960s and 1970s, it was utilised by the structural/materialists as an expression of indexicality and as an anti-illusionist apparatus. That the optical printer can be utilised in such seemingly divergent ways points to the multiple methods in which the moving image produces its effects. Such a realisation belies the dualistic conceptions of moving image technologies as either cultural or technological. It, thus also drives any attempt to alleviate the concerns that arise in relation to such technologies to go beyond seeking resolutions in either purely technical or purely cultural responses. What the media archaeology of the optical printer in Chapters Two and Three outlined are the material and immaterial aspects from which meanings are produced with the optical printer. These
understandings were born out of an inquiry into not only the history of the optical printer but also its interwoven history within a wider cultural and technological environment. The problem still arises, as with any archaeology, as to how to reconcile the technological aspects of that apparatus and the mode of its expression: one that does not relegate human agency. Some of these concerns were mitigated by a consideration of the user or viewer in this account. Crary’s (1992) account of the changed subject of the 19th century highlights the way in which perception is structured within modernity. Kittler’s “mother’s mouth” (1990) postulates meaning making in relation to writing, and this notion has been utilised to consider moving images as a form of time-axis manipulation (Krämer, 2006). By using controllable time and space (Kittler, 1999), moving images therefore become an interweaving of subject and object. The material and immaterial aspects of the optical printer were expressed through a reading of von Uexküll’s umwelt (2010), which further builds a bridge across the technological and cultural divide. The notion of umwelt allows for inscription to be understood as co-constituted, rather than as binaries such as cultural construction or technological determinism. Rather, the umwelt of the optical printer, as Chapter Two addresses, runs counterpoint to a wider network that can account for imaginary dimensions, such as the indexicality of the structural/materialist film alongside the illusionism of Hollywood. Yet it is only alongside the elaborate examination of the 1905 short film by Jacobs, *Tom, Tom, the Piper’s Son* (1969), that the discussion more clearly identified the optical printer (with its controllable time) as having embodied dimensions. These dimensions can be seen to be obscured in its operations within the archive or as an instrument of special effects. Jacobs did not use an optical printer in its mechanical assemblage; rather, he used his own body to amplify the duplication and optical relations of the apparatus – much like the film amplifies the aesthetic and material elements of the 1905
film. Jacobs’ artistic intervention allows for a reading of the optical printer to include an embodied understanding of technological apparatus and the moving image.

Producing a media archaeology of the optical printer serves as a model of the archive not only in its use within archival practice but also in defining what archiving is through its practices, the material and immaterial aspects of duplication, and time-axis manipulation. The problematising notion of archiving the un-archivable helped to conceptualise a formulation of the archival process by modelling its outline from resistances and contestations. Examples of these resistances include how to archive moving image works that oppose dominant modes of representation – works that insist upon their presentness as central to their anti-illusionism. This is the case with structural/materialist works or ephemeral works such as performance-based expanded cinema works, where what is left (if anything) is a trace indicated by documentation.

Within Chapters Two and Three, what was also discerned beyond the above archaeology, which understands the optical printer within a wider network, are concepts of storing and retrieving. These concepts which seem integral to the archival process, are re-addressed in the formulation that archiving the un-archivable can be conceived as retrieving the irretrievable. This facilitates a further step in constituting a practice with the archive: one that can additionally overcome the divide between the content and the apparatus.

5.3 Storing, copying, and retrieving: Archaeology and practice

Conceptualising the archive through its practices, such as those demonstrated in Chapters Two and Three in relation to paper and film, highlighted the importance of duplication as a form of storage. The case of the Paper Print Collection supplemented an understanding of moving images that already overlapped with literature and other media, such as postcards. In these instances, reproductions and duplications could be
excused as a form of remediation (Bolter, Grusin, and Grusin, 2000). What the study of
the Paper Print Collection made apparent, however, are the ways in which remediation
fails to account for the wider implications of the process of duplication and the
subsequent retrieval. The Paper Print Collection, explored through this thesis’s
approach to media archaeology, conveys the way in which film history is facilitated by
what evidence is available or unavailable through the archive. This evidence is a matter
of not only film material but also the wider network that intersects with moving images.
The case of the paper prints particularly highlights the role of legal institutions and
frameworks such as copyright, as articulated in Chapter Three. The Paper Print
Collection facilitated a development within moving image technology: with the
endeavour to retrieve the content, new technological innovations and developments
occurred. The Paper Print Collection’s *umwelt* (2010), like that of the optical printer,
posits an environment by which new technological apparatus were engendered, new
forms of content were expressed, and creativity and imagination were articulated within
the same environment as facts and documents. The Paper Print Collection produced new
optical printers, new forms of entertainment (such as the RKO Flicker Flashback series
(Grimm, 1999)), artistic interventions (such as *Tom, Tom, the Piper’s Son* (Jacobs,
1969)) and the necessary evidence to form a reappraisal of early cinema (Elsaesser,
1990). This understanding of the copy and its retrieval formed a necessary step in the
thesis’s approach not only to conceptualising the archive but also to constituting
archival practice. This practice overcame the dichotomies of the archive as
 technological or cultural, as well as overcoming the divide between the apparatus and
the content of moving images. So conceived, the moving image archive in its simplest
sense stores and retrieves by means of reproduction. However, those forms of
duplication have material and immaterial aspects, as addressed above.
The thesis’s next step in accounting for the retrieval of the moving image not only in material terms was to consider the content of the image. This was made possible by supplementing the art historian Aby Warburg’s strategy of reproduction and assemblage from his Mnemosyne Atlas project (Warburg and Rampley, 2009). Warburg’s constellations of reproduced images on large panels traced the motifs and gestures that were expressions of cultural memory between antiquity and the Renaissance as transmitted by the works of art. The thesis was able to utilise Warburg’s approach, which is concerned primarily with the image. His approach lends itself to the strategies of the thesis because his method attempted to problematise and oppose dominant approaches to art history that were canonical and linear. Warburg sought continuities and discontinuities in his assemblages of images, and so, as Rampley notes, Warburg’s intuited changes in the conception of culture (Rampley, 2001) by positing his own discourse network for antiquity.

What this thesis did, which produced a new approach in utilising Warburg’s Mnemosyne Atlas, was to transform Warburg’s cosmology to that of an umwelt of the moving image apparatus to construct the Mnemosyne Radical Moving Image Archive. This moving image apparatus of the Mnemosyne is drawn from the reading elicited from a media archaeology of the optical printer. Moving image archival practice becomes the work done amongst the reproduced moving image works, identifying in the images the repressed and sublimated motifs and gestures across multiple screens, beyond the categories of traditional film studies. However, moving image archival practice is also the work across images, in the ways in which the optical printer operates in amplifying the image in its material and immaterial aspects.

Chapter Four’s examples highlight the two necessary strategic moves to constitute the Mnemosyne Radical Moving Image Archive. The first example aimed to relieve the divide concerning Peter Wollen’s assertion of the “two avant-gardes”
(Wollen, 1975). The first step required constructing an index, as with Warburg’s first few cosmological panels. The thesis was able to draw out those motifs and gestures of avant-garde practice that were similar and dissimilar through an exploration of the image that did not base its reading on the regular categories of film studies. Rather, it could address the material aspects of the images through its manipulation of the archive as an apparatus, such as a manipulation of the time and space axes.

The second step that this thesis made was to employ the index to explore other concerns that seem to burden the archive. The second example explored a work that does not exist within the archive as a moving image work: the performance *Reel Time* (1973) by Annabel Nicolson survives as a few photographs and oral accounts. This was explored through looking at the indexical panels within a new panel construction that could reproduce the *umwelt* of *Reel Time* (1973) as an imaginary dimension through reproductions of similar and dissimilar motifs and gestures within moving images. The documentary material, the Mnemosyne index images of avant-garde practice, and the similar works by Nicolson and others produced an assemblage that could, as in the previous example, allow for reading across and between images. This opened up Nicolson’s *Reel Time* (1973) to readings made possible with this thesis’s conceptualisation of the archive. A conceptualisation of practice as an apparatus modelled on the optical printer and the speculative radical artistic archival practice bringing together the work of Warburg and von Uexküll. The analysis also articulated through the *Mnemosyne Radical Moving Image Archive* that the practices of structural/materialist filmmakers could be understood outside of the narrow confines of materialism.
5.4 Further considerations and future research

The *Mnemosyne Radical Moving Image Archive* has placed the user in this assemblage into a number of different roles. Throughout the research, these roles have been interchangeable, and the thesis has attempted to navigate amongst the subject of Kittler’s “mother’s mouth” (1990), Crary’s observer (1992) and Jacobs’ embodied artist of *Tom, Tom, the Piper’s Son* (1969) behind the camera, performing the optical printer.

Subject position was alluded to, and it was the dynamic embodied position of the archivist as user and artist that resonated most within this research. However, the notion of subject position in relation to the assemblage of the *Mnemosyne Radical Moving Image* is one that overlaps with another problem pointed out within the research: the ethos of images. This problem was raised at the end of Chapter Four and indicates that one of the functions of the *Mnemosyne Radical Moving Image Archive* as a radical moving image archival practice is to open the archive up to inquiry, rather than generating all-encompassing narratives of its subject matter. However, in raising the notion of an ethos of images, the role of the archivist, now shifted to that of artist and user, suggests a discontinuity that points to digital and new media. As outlined in Chapter One, media archaeological theories tend towards the discontinuities between analogue and digital, and similar concerns with archival practice highlighted by digitisation and accessibility (raised in the introductory chapter) also point to the digital. Yet, it was not the scope of this thesis to consider the wider concerns of the digital at this time; the archaeology of the optical printer left off where the move to the digital became most apparent with the use of scanner technology. It was the concern of this thesis to look again at the role of the archive within a body of research that highlights the lack of an approach to the archive that could articulate both the apparatus and the image without recourse to technological determinism. It would, however, be an area for further research to consider the overlap of moving image technologies within a wider
network that includes the digital, with this current research as support to foreground that the digital within moving image technology does not assume cinema as its precursor.

The archivists, as with Warburg’s artists who must repress or sublimate those gestures and motifs of antiquity, are part of a wider milieu and the consideration of what to use and re-use in formulating the *Mnemosyne Radical Moving Image Archive*. The choice of topic, the selection of moving images, and the subsequent manipulation of these via the time axis open up further possibilities to explore. One particular notion is that of shifting subject positions and how those choices of moving image works, relating one set of images with another across traditional categories of knowledge, require articulating another set of problems. This would require bridging other bodies of knowledge, for which this research only laid the basis for a consideration of an ethos of the image.

Further developments for this research also lay in its iteration as archival practice; Chapter Four elaborated a *Mnemosyne Radical Moving Image Archive* in relation to avant-garde moving image practice. For the purposes of this research, the avant-garde offered a set of problems that allowed for an exploration of moving image practice and the archive, situated within the context of archiving the un-archivable. The exploration of other bodies of moving image works would illuminate other possible applications for the *Mnemosyne Radical Moving Image Archive*; its radical nature is in drawing out possible experiences and meanings in contested areas of archival practice. This may be a limiting factor in its application, but this would require more-extensive testing and evaluation.

The technical aspects of the *Mnemosyne Radical Moving Image Archive* are also an area for future development. At present, the archive is expressed within a static environment, reproducing panels (as with Warburg’s *Mnemosyne Atlas*) for this thesis without the dynamic quality that was part of their production. Though, unlike the atlas
project, the capacity for a dynamic interactive rendering would be possible with further iterations with the application of greater technical input, as highlighted within Chapter Four.

The thesis brought together a combination of methodological approaches and discrete bodies of knowledge to develop an original approach to moving image archival practice. This approach mitigates the tendency for the concerns of the archive to be understood as either technological or cultural critiques. It highlights that a perspective that accounts for media apparatus as having material and immaterial aspects can shift archival practice. This shifting would alleviate the burden of moving image archives having to store and preserve everything. Rather what is elaborated are notions of the un-archived and un-archivable as part of a strategy of radical artistic archival practice.
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The (Im)material Aspects of Film Duplication: The Optical Printer as a Philosophical Apparatus

Amanda Egbe & Martyn Woodward
The (Im)material Aspects of Film Duplication: The Optical Printer as a Philosophical Apparatus

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Abstract

This paper looks at the notion of the optical printer, its history, and its use in artists’ film and video, and in film archival practice as a philosophical apparatus. The basis for this enquiry relates to a wider project concerned with radical interpretations and strategies of moving-image archival practice. Using the lens of materialist media theories – in the first instance, the concept of ‘discourse networks’ – the paper speculates on theories of understanding in order to explore the production of the image itself and how it is ‘received’.

Introduction

The paper outlines the history of the optical printer, particularly in relation to how it has been used in the production of film, in both dominant and avant-garde cinema, and as an apparatus within the archival process. The optical printer began as part of an enterprise that put in-camera effects into a device outside of the camera. During the Second World War, it was standardised and mass-produced for the Hollywood studios. Post-war, however, it became a device used by filmmakers of the avant-garde to transgress, subvert and oppose the dominant mode of moving-image production. The archivist’s lab also houses the optical printer, and it is here, in the process of duplication, that this paper begins to interject, by first posing the question of whether the use of the optical printer can – as in one facet of experimental film, Structural Materialist practice – start to open up different ways of viewing the archive; that is, as an oppositional practice, allowing alternative ways of viewing the materials of the archive.

The question is posed as part of a larger project concerned with materialism(s) and archival film practice. It begins with a problematic – that there appear to be bodies of work, such as Structural Materialist filmworks, that resist conventional archiving categorisation. As a practice, these demand more focus upon materiality and metaphysics than the archive can fully allow. The framework set out in this paper suggests that by first examining the optical printer as part of a material ‘discourse network’ (Kittler, 1990), we can begin to position it within the wider discursive environment of late-nineteenth century technologies such as Pepper’s Ghost, the cosmorama, diorama and other optical devices.

Situated within this wider network of technologies, the optical printer, like the panorama and diorama, emerges as part of a discourse of cognitive and perceptual illusions and tricks, as thinkers such as Crary (2001) reveal. Crary sees notions of the ‘real’ as illusory, rather than mechanically representational, commonplace environments in which the ‘subject’ could find him/herself. The human ‘subject’ in this paper – in combination with an analogous reading of Kittler’s (1990) ‘Mother’s Mouth’ theory – can thus be seen, within the material discourse of the apparatus, as contributing a metaphysical dimension to the discourse network of which the optical printer is a part.
In such a framework, the paper suggests that the optical printer can be read as a ‘philosophical apparatus’ – that is, as a device that reveals the metaphysical and material conditions of its own production as a trace within the works produced. Using this premise, the paper further speculates by way of a thought experiment borrowed from the ecologist Jakob von Uexkull (2010) and a revision of the material nature of historical evidence offered by the discourse of ‘deep history’ (Shryock and Smal, 2009) on how we can ‘think through objects’ (such as film works) in order to describe the material and immaterial (metaphysical) cognitive processes left as traces within them.

As a philosophical apparatus, the works produced by the optical printer not only become traces of the material processes of the apparatus’s own production, but are also constituted from an imaginary dimension within the human mind, which is itself implicated in the production of the image. Such an analysis, the paper suggests, opens up the possibility of re-thinking the methodological, theoretical and philosophical approaches to the moving image archive, and the instruments, apparatus and works it contains, within a wider scope of both meaning-making and creativity.

The optical printer

The optical printer, a device used to re-film the photographic image frame by frame, could be found in the studios of the London Filmmaker’s Co-op of the 1960s and 70s and in most major studio special-effects labs, and can still be found in the film archivist’ lab. The optical printer, simply put, is a combination of projector and camera, in which the printer can pull a film, frame by frame, through its mechanism in order to re-photograph it onto a new roll of unprocessed film. Utilised in this sense to produce a duplicate of the film, it also offers a wider catalogue of reproduction possibilities through its adjustable properties, such as the ability to enlarge and reduce details within the frame, and to produce dissolves, fades and many other effects that were previously separate in-camera processes.

The in-camera effects such as super-impositions, mattes and substitution shots formed a fundamental aspect of the early history of the cinematic apparatus, from Edison’s studio films such as the Great Train Robbery (1903) to the trick shots employed in the films of Georges Méliès (Okun and Zwerman, 2012).

These effects and illusions, which are implicated in the in-camera and early visual effects of the optical printer, belie the wealth of instruments and apparatus that fought for popular attention in the World’s Fairs, music halls and theatres of the nineteenth century, in which shows such as the phantasmagoria employed multiple projections to create a multitude of effects (Altick, 78, pp. 211-220). Similarly, the Pepper’s Ghost effect of the 1860s used plate glass, lighting effects and projections to make objects seem to appear and disappear before the eyes of the audience. These types of illusions were created in an atmosphere of exchange that encompassed both scientific interrogation and popular entertainment: Cray’s (1992, p. 105) account of the thaumatrope, which highlighted the phenomena of the afterimage through spinning discs with complimentary images, reveals how the device served the domains of both science and entertainment. The notion of ‘illusion’ implicit in these manifestations of popular entertainment also finds a resonance in the optical printer – an idea that the paper will return to.

The optical printer became home to out-of-camera effects. The first commercially available printer was made by the Dupue company in Chicago in the 1920s (Okun and Zwerman, 2012). However, most optical printers were bespoke creations, built by camera operators, visual-effects specialists and cinematographers in
film studios, who were required to create special effects as and when a production demanded. The optical printer became a standardised instrument, made available to the film industry as a whole with the onset of war. Linwood G. Dunn, a projectionist and cameraman, created the Acme-Dunn optical printer, with Cecil Love, for the United States Armed Forces Photographic Units in 1943 (Burum, 2007, p. 270). It was the first printer designed for mass production and was used for propaganda on the war front. (The co-production of technologies for war and cinema is discussed most notably by Virilio (1997) and Kittler (1999).) The optical printer in this regard became a staple of the studios, used for a plethora of effects: the travelling matte, blow-ups, reductions, anamorphic conversions, modifying and salvaging film, transitional effects, change of size, position, frame-sequence modification, optical zoom, superimposition, split screen, quality manipulation and adding motion (Burum, 2007, pp. 271-274).

**The London Filmmaker’s Co-op**

The optical printer, standardised during the war, became surplus equipment, post-war. Its technology, however, helped the underground movement of film co-ops and amateur groups in the 1960s when they set up workshop facilities in order to build their own bespoke optical printers (Rees, 2008, p. 57). The London Filmmaker’s Co-op, founded in 1966, was one such organisation. It was founded according to the principle of producing and screening the work of their members on a collective basis – and it was out of this that the Structural Materialist movement grew. This movement, as defined by Gidal (1976), was formed in direct opposition to the dominant practices of cinema that attempted to make their ideological framework invisible and disguise the conception of reality they conveyed through narrative codes that reinforced the capitalist mode of production:

Narrative is an illusionistic procedure, manipulatory, mystificatory, repressive. The repression is that of space, the distance between the viewer and the object, a repression of real
space in favour of the illusionist space. The repression is, equally importantly, of the in-film spaces, those perfectly constructed continuities. The repression is also that of time. The implied lengths of time suffer compressions formed by certain technical devices which operate in a codified manner, under specific laws, to repress (material) film time. (Gidal, 1976, p. 4)

The Structural Materialist strategies put forward to create a non-illusionist cinema were concerned with demystifying the film’s production and spectatorial processes. For the Co-op, film became a record of the processes of its making. It was not a representation of some event/action in front of the camera; rather, the film was a record of its own material concerns.

The optical printer in the hands of the Structural Materialist filmmaker targeted the obfuscation of the illusionist use of the dominant cinema narrative. The optical printer here, as in the early days of its use in the 1920s and 30s, was a bespoke, hand-made tool, allowing filmmakers to work with found footage and to endlessly rework images frame by frame. Little Dog for Roger (1967) by Malcolm Le Grice, for instance, re-photographs an old 9.5mm film. Presented as a continuous strip, with the sprocket holes visible, the sequence is repeated at different speeds, with freeze frames and displacement within the image field. The filmic process – the grain, emulsion and materiality of the film and its projection – become the focus of the ‘content’:

‘Film as Film’ is an equivalence to the modernist view that the meaning and aesthetic base of a work derives from its material rather than from an illusionist representation. Stressing the primacy of the work as material, as process, and constructing the aesthetic experience from the characteristics of the medium, is not to eliminate meaning, or the symbolic, but to shift it to an arena where the art work becomes a component in the developing world rather than a passive reflection on it. Meaning is formed in and by the work as it moves dynamically from the acts of making into its passage through the world. (Le Grice, 2001, p. 275)

For the Co-op, the film image was seen less as a direct copy of an external world, and more as a record of the traces of the material process of the film’s production (that of the apparatus of the optical printer itself).

The optical printer in the archival lab

The other significant use of the optical printer is in the archivist’s lab, where ‘duplication’ is a necessary step in the restoration process (Read and Meyer, 2000, p. 4), and is facilitated by a range of printers. As Read and Meyer show, the optical printer offers advantages in its ability to allow duplication of shrunken films, enlargement and reduction of the image, and horizontal and vertical reframing. The optical printer’s use here appears to echo the Structural Materialists’ concerns – that is, the concern for the material of film. Read and Meyer highlight the wealth of technical issues that confront the archivist, and the ways in which the optical printer helps negate these:

This type of printer is very suitable for archival use, especially when equipped for wet printing. Although many manufacturers made optical printers, only the best and the most flexible are really suitable for archive use. However, just one of these printers can carry out all the operations required, and suffer principally from the shortcoming that they are generally, with the exception of the Debie TAI, rather slow. (Read and Meyer, 2000, p. 132)

It could be argued (albeit reductively) that in this illustration the processes are seen to restore the given film under its purview to a state whereby the archivist’s own intervention is rendered invisible. For the Structural Materialist, the concern for the material aspects of film are utilised not to demystify the filmic process, but
rather to maintain its illusionistic properties. The viewer, in this analysis, is not drawn to question the nature of representation – this can only be done, according to the Structural Materialists, “through the individual’s active, participatory structuring of actuality” (Le Grice, 2001, p. 170). This ‘active’ structuring is not possible when the intervention by the archivist is not the focus of the film.

However, the film archive – and this differs between the context of national archives and local niche ones – cannot be so easily charged with simply being concerned with duplication in order to faithfully reproduce the films in its collection; there is an awareness of a creative dimension:

Today, most film archives and specialist film laboratories are aware of the fact that mere duplication of the photographic information of a film is not enough. Films are not interesting only for their information or narrative. The treasures in the archives are often not properly safeguarded when no justice has been done to the aesthetic quality of the films, either by an accurate duplication or in a conscious restoration. (Read and Meyer, 2000, p. 4)

The interventions necessary for the restoration and reconstruction process revealed above immediately allude to the practice of manipulation that the Structural Materialist filmmakers foregrounded; the archive in this sense does not hold to the notion that it merely pragmatically reproduces and duplicates, there is always a concern for what is changed and the difference engendered by the new photographic process (Read and Meyer, 2000, p. 1). The nature of this creative dimension alludes to the further question of whether the nature of this difference can be read in terms of how the technologies (such as the optical printer) involved in the very process of duplication and restoration are understood.

‘Mother’s Mouth’

The understanding of the optical printer as an apparatus situated within a network of technologies utilises Kittler’s (1990) concept of a ‘discourse network’. This is used to frame the process of meaning-making attributed to media, both analogue and digital – that is, how these media and their use constitute a way of deciphering noise into ‘meaningful’ utterances. This reflects a materialist approach concerned with technology, independently of its content. However, this paper builds upon a notion of media that sees the optical printer as a philosophical apparatus, implying a different way of understanding the image. In Kittler’s analysis, he ascribes a different operation to the media technologies of the discourse network of 1900 from that which preceded it, namely the discourse network of 1800, which saw writing as the pivotal media:

Writing operates by way of a symbolic grid, which requires that all data ‘pass through the bottleneck of the signifier’, whereas phono-, photo- and cinematographic analog media process physical effects of the real. (Winthrop-Young, 2011, p. 59)

The photographic media, unlike the symbolic media of language, are not separate from the object, because the output of such media produces data that comes about through the storing of light and sound waves from the object in question. The hegemony of language becomes divided, according to Winthrop-Young’s introduction to, and translation of, Kittler’s (1999) Gramophone, Film, Typewriter, “among media that were specific to the type of information they processed” (Kittler, 1999, p. xxv) – that is, there is no longer a reliance on symbolic mediation. However, Kittler’s inclination to posit that this media stores something of the real object is questionable when we think of animation, as what is stored here is a graphical trace.
But his argument holds some resonance if we return to the practices of Structural Materialist filmmaking. The assertion focuses here not on storing the light and sound waves of the real object, but on the experience of materialist filmic processes in relation to “the physical substance of the film medium – physical base – acetate – emulsion surface – photochemical response and its chemical development” (Le Grice, 2001, p. 165), in order to experience the ‘real’ as that which is presented to the viewer.

The only art which deserves the term realist is that which confronts the audience with the material conditions of the work. Work which seeks to portray ‘reality’ existing in another place at another time is illusionist. (Le Grice, 2001, p. 170)

Structural Materialist practice confronts the viewer with the notion of reality as ‘presentness’, and the use of the optical printer falls within the strategies used to expose the viewer to, rather than to exploit, perceptual phenomena.

Kittler’s definition of a discourse network as “the network of technologies and institutions that allow a given culture to select, store and process relevant data” (Winthrop-Young, 2011, p. 40) indicates, in relation to the discourse network of 1800, how language was inscribed and put to work through the re-organisation of language learning. The ‘Mother’s Mouth’ theory proposed that children learn language through the lullabies and sounds uttered to them by their mothers. These ‘minimal signifieds’ were somewhere between real words and meaningless utterances, sounds that, according to Kittler, were “pregnant with meaning” and produced “psychically centered individuals” who saw language as always laden with meaning (Winthrop-Young, 2011, pp. 28-34). These assertions help Kittler explain how meaning is produced, and when this approach is applied to the discourse network of 1900, another rupture in his reading of history occurs with the media of Edison, which, as stated earlier, is one that places language in a lesser position. Kittler asserts that the agency of human inscription is thus relegated; as handwriting, in particular, gives way to the typewriter, the human being becomes instead an inscription surface.

However, more pointedly, this paper is concerned with the element of Kittler’s analysis that equates the Mother’s Mouth with the construction of ‘subjects’ who see language as pregnant with meaning. Crary (1992) elucidates the way in which the ‘subject’ was repositioned through the technologies and apparatus of the nineteenth century. The ‘subject’ is part of the reading of the discourse network of the optical printer, which functions as a duplication instrument, optimised for mass production by Linwood Dunn; one that is as equally able to restore and repair the image, as it is to add, slow down time, freeze-frame or conduct any number of illusions. It is part of a discursive environment of technologies, which includes Pepper’s Ghost techniques, the cosmorama, diorama, and a plethora of other optical and perceptual instruments and contrivances concerned with cognitive and perceptual illusions and tricks, as well as instruction. The thaumatrope, as outlined above, is a …

… ‘philosophical toy’ [that] made unequivocally clear both the fabricated and hallucinatory nature of its image and the rupture between perception and its object. (Crary, 1992, p. 106)

Crary’s assertions of the changed subject/observer allow a fuller account of the optical printer that takes it beyond the materialist stance. The Structural Materialist concern for the materiality of film can be seen, in this context, as placing too much weight on the indexicality of the image; rather, there are immaterial dimensions that need to be accounted for – a co-constitutive metaphysical dimension.
The immaterial

Shryock and Smail (2011) suggest that to take these immaterial dimensions of reality seriously we need a narrative that triangulates between agents and materials. For Smail, this shift in focus requires a different account of cognition than has been previously adopted. No longer is the human being an agent working upon nature – as such, human cognition is no longer above nature but must be relational to it (pp. 30-31). Smail adopts a version of the contemporary ‘extended mind’ hypothesis, in which the mind is distributed within social relationships and physical materials, which take cognition outside of the head and into the world (p. 31).

Materials and artefacts are thus always implicated within our cognitive architecture; rather than simply being the outputs of internal cognitive processes, they are an aspect of cognition itself – artefacts become containers for human cognition. Deep history builds upon a historiography of the human within a wider network of artefacts, imaginations and cognitions by thinking through the artefacts – that is, through the traces of the process of the artefacts’ production and use that is distributed amongst a wider material and immaterial network.

Smail, therefore, calls for a narrative that thinks through objects as a description of cognitive processes. This narrative can be suggested by a thought experiment borrowed from von Uexkull (2010), who provides an account of the creation of form in terms of the wider metaphysical and physical processes that produce that form. In foregrounding the metaphysical as a constituent of the creation of forms such as the spider’s web, von Uexkull builds a network of mixed physical and metaphysical threads, constituting a ‘tapestry’ within which the form of the spider’s web emerges as a counterpoint (pp. 159-160). As von Uexkull claims, the spider spins a web before it has ever met a physical fly – the web is therefore not a representation of any particular physical fly; rather, it begins to represent a ‘primal image’ (an imaginary) of the fly, which is not physically present. Von Uexkull doesn’t end here, for there is also a primal ‘score’ (or way of being) for the fly, just as there is for the spider. He asserts that the primal score of the fly (which is also affected by the fly’s own primal image of the spider and other aspects of the environment) affects the spider’s imagined fly. Von Uexkull believes it is in this way that the spun web can be called ‘fly-like’ – as the ‘fly-likeness’ of the web is constructed in counterpoint to the entire tapestry of metaphysical/physical dimensions (pp. 159-160).

As with Shryock and Smail, von Uexkull’s thinking suggests that forms (such as human artefacts like the optical printer) contain, in some way, an imaginary dimension – or what could be called ‘consciousness’ – of not only the organism that is seen as the controlling agent, but of all the organisms within the wider tapestry of the environment that leave a trace upon the form. Thus, a material is always constituted by a collective consciousness that itself plays a role in the process of the form’s very generation. In this way, von Uexkull conceives of the form as emerging within a tapestry of counterpoints and lines, or a meshwork of metaphysical and physical strands (pp. 159-160).

For von Uexkull, forms (of organisms or environments) are contrapuntal (or plastic), emerging within multiple semi-independent melodic lines, always as a counterpoint to the entire composition (pp. 159-160). To return to the optical printer, as a form that runs counterpoint to such a tapestry – as with the spider’s web – the harmony of scores that run counterpoint to the form’s production are constituted in part by consciousness. What becomes inscribed within the process of the creation of an image is not just the material apparatus that
supports the optical printer, but the consciousness (imaginations, desires, beliefs) which, in part, co-constitutes that apparatus.

**Conclusion**

The ways of viewing the moving image archive, particularly focusing on the notion of duplication through the apparatus of the optical printer, as posed by the initial concern of this paper, takes on a different character when viewed through the lens of discourse network theory. The optical printer, a seemingly benign instrument within the production and archiving of film, can now be seen as a philosophical apparatus, an active inscribing agent, with which the film work can also be seen as indexical. This bespoke instrument of the early film studios and the London Filmmaker’s Co-op can be situated within the contexts of both illusionist and non-illusionist cinema – forms that seem at odds, yet are linked materially in practice – and finds some resonance in the archival process. The optical printer can be seen as a part of a network that includes the optical toys and changed ‘subject’ position that, according to both Kittler (1999) and Crary (1992), occurs in the nineteenth century. As such, the optical printer becomes imbued with the very notions of ‘subjects’ that read the multiple as everyday, particularly in relation to the conceptions of time and space that underpin our sense of causality and agency.

It is in developing Crary’s notion of the changed ‘subject’ position, extending it through the thought experiment of von Uexkull to account for the further immaterial (metaphysical) dimensions of human and non-human agents, that this paper attempts to overcome the burden of the indexical link when reading through Structural Materialist practice. As such, it is no longer a question of the illusionist or non-illusionist cinematic image; rather, thinking about the process of duplication through its apparatus and processes opens up an (im)material network that accounts for both the material apparatus and human creativity and imagination as co-constituted within the archival practice itself. Such recognition incites a theoretical framework that moves from a material towards an immaterial conception of the moving image archive.
References


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