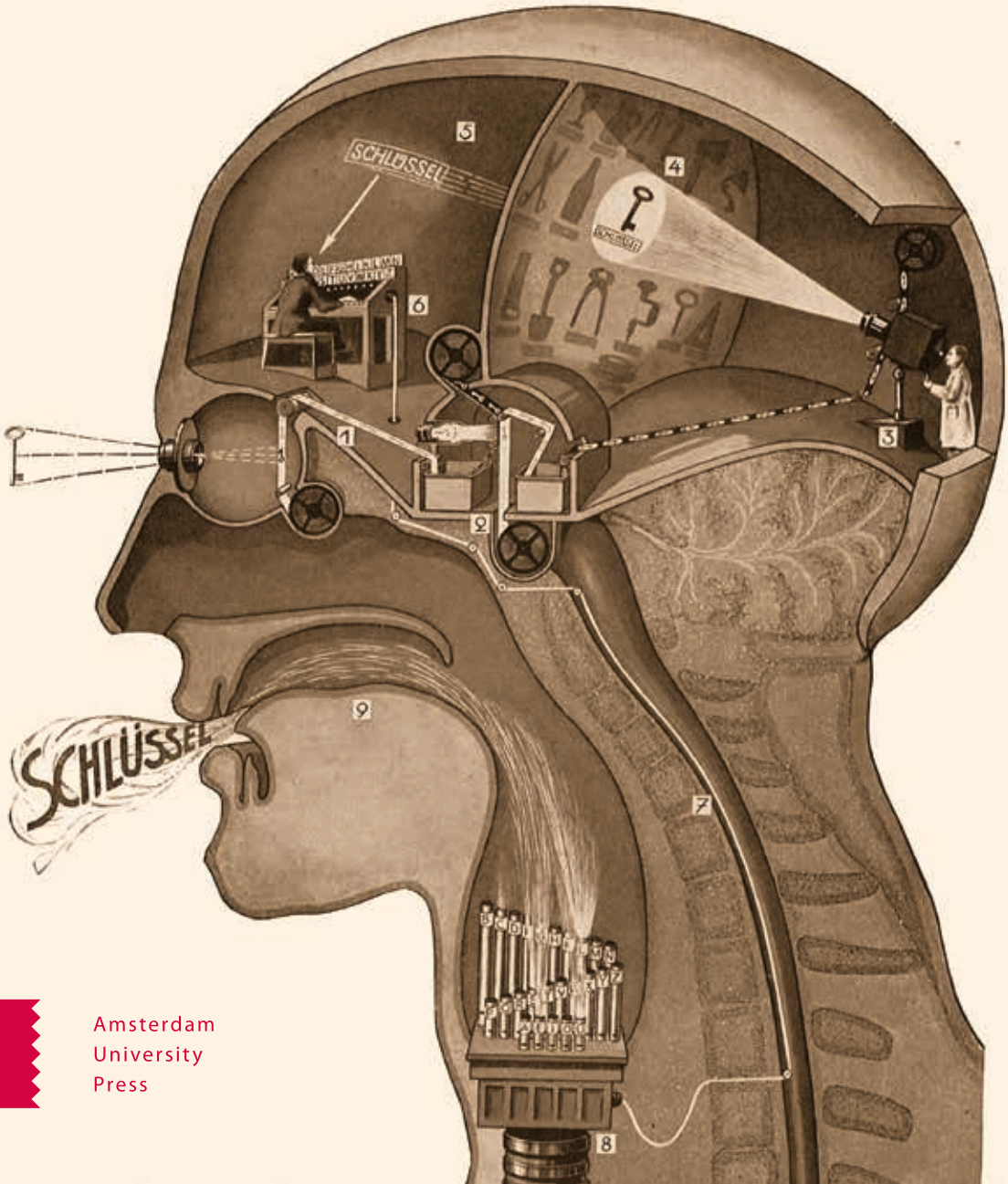
FILM THEORY IN MEDIA HISTORY

TECHNOLOGY AND FILM SCHOLARSHIP

EXPERIENCE, STUDY, THEORY

EDITED BY SANTIAGO HIDALGO
FOREWORD BY ANDRÉ GAUDREAULT



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Technology and Film Scholarship

Film Theory in Media History

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Foreword

André Gaudreault

Ever since the digital revolution radically blurred the boundaries between media, cinema – in any case, *cinema as it had been known* – is, according to some, in the midst of dying. In a recently published book (which I co-authored with Philippe Marion), entitled, incidentally, *The End of the Cinema?* (note the question mark),[1] we studied the effects of the most recent technological innovations on cinema and on the crisis that the medium faces in the digital age. We tried to show that though the medium itself is far from expiring, there is still *something of cinema* that is actually dying – even if only a certain 'idée du cinema', to use the French title of Dudley Andrew's recent book (2014).[2] While the digital turn produced a previously unprecedented *convergence* of media, this movement was concomitant with the production of a large number of *divergences* – between *what cinema was* (or rather, 'the idea' we had of what cinema was) before the transition to digital technology and *what cinema is becoming*.

Within the international community of film researchers, this digital turn has fueled many debates, which have logically led to the return of film technology as an integral element of film theory, film aesthetics, archiving and restoration, and discourse about film industry and film epistemology. What had once been at the margins of film studies, a distinct, circumscribed area of film history for aficionados, collectors and some notable researchers (such as Barry Salt, Paul Spehr and Deac Rossell, for example), has become a central hub of theoretical questioning. The impact of this confluence of media convergences and divergences thus initiated a new stage in the history of film studies. To give only two personal examples (relevant to this book), in the last six years I co-organized (with Martin Lefebvre) one of the largest film conferences ever on the effect of technological innovations on film theory and film historiography (*The Impact of Technological Innovations on the Historiography and Theory of Cinema*, or simply, IMPACT, in 2011 in Montreal); I also participated in the launch of an inter-university partnership, TECHNÈS (between Université de Lausanne, Université Rennes 2 and Université de Montréal, and other film institutions),[3] with the aim of producing a new digital encyclopedia of film technology, from its origins to the present day.

These new initiatives are outcomes of the fundamental, groundbreaking impact of the digital age, which not only changed the face of cinema in the form of special effects and viewing platforms, but also the underlying

tenets that provided cinema with a distinct identity (such as celluloid). This disintegration of identity and subsequent self-questioning have resulted in wholesale reorganizations of film departments, with the inclusion of video game studies and media studies, or the absorption of film itself within broader, more diffuse disciplines (such as film and moving image studies). In the midst of this, film technology has emerged as a new centralizing arena for film researchers to excavate, sort, and classify. Its identity *feels* clearer – clearer, at least, than the competing *ideas of cinema* – the materiality offering an objective reality on which to test old film theories and to fashion new ones.

So, then, what is the importance of these apparatuses and devices of all kinds for the theory and history of cinema? Have they contributed to opening up new ways of thinking and methodologies or to contest certain ideas received in the field of cinematographic studies? Notions as fundamental as realism, authenticity, or representation, for example, are now placed under the banner of technology, which determines their intrinsic modalities. Today, we speak of the language of new media. The tools of computer-assisted analysis developed for academic purposes (*Cinemetrics*, *Lignes de temps*, etc.)[4] are multiplying. Digitizing has revolutionized film restoration and archiving. Media issues become technological issues. The urgency of questioning the emergence and development of these discourses by putting them in their historical context is beyond question. These are the issues that the IMPACT film conference attempted to answer. Uniting over a hundred researchers of different backgrounds for a week-long, collective investigation of the impact of film technology on the history of film theory and historiography, the conference was a resounding success, with one reviewer calling it "*the* defining event in Film Studies in 2011"),[5] and produced a series of collections and publications.[6]

It also resulted in this important volume and collection of papers, organized around the notion of the impact of technology and the different phases of film scholarship, which is the end product of the work of researchers, teachers, archivists, and scholars. New technologies – not just those involved in the production of film – have revolutionized the way we think about and experience film. The works of my colleagues in this volume, many of which were first presented at the IMPACT conference, and selected and edited by Santiago Hidalgo, provide an authentic, vibrant account of where we stand today in the study of the relationship of technology and film, spanning from the beginnings (with the works of my post-Brighton early cinema studies colleagues Charles Musser and Tom Gunning), to the present day, with a new generation of scholars (Vinzenz Hediger, André Habib, and Benoît Turquety among them).

From the groundswell of energy, goodwill, and collaboration that sprung from the IMPACT film conference emerged the TECHNÈS partnership, in collaboration with Turquety (from Université de Lausanne) and Gilles Mouëllic (Université Rennes 2). The members of the TECHNÈS team will carry out, over the next seven years, an in-depth study of the links between film aesthetics and film techniques, practices and film forms, machineries and concepts of cinema, focusing on different moments of technological upheaval, stretching from the advent of the first projectors and chemical innovations that resulted in the projection of film strips, through the coming of sound and competition with the new mass media of television, to the ultimate integration of the new, digital, transmedial universe we all inhabit. Each of these moments was accompanied with a set of discourses, a set of practices, and a set of public and institutional usages, which constitute the object of study questioned and explored in this work. Not only is it an essential work, it marks a moment of passage between paradigms of film study.

Notes

1. Gaudreault and Marion, *The End of Cinema?*
2. Andrew, *Une idée du cinéma*.
3. The partnership, funded by the Social Sciences and Humanities Research Council of Canada (2015-2022), consists of 48 experienced Francophone and Anglophone international researchers and 18 partners, including three research groups (GRAFICS of the Université de Montréal, the Dispositifs group of the Université de Lausanne and the Arts pratiques et poétiques team of the Université Rennes 2), six institutions related to archival missions (the Cinémathèque québécoise, the Cinémathèque suisse, the Cinémathèque française, Bibliothèque et Archives nationales du Québec, the International Federation of Film Archives and the George Eastman House), three schools of cinema (Canada: Institut national de l'image et du son, Switzerland: the l'École cantonale d'art de Lausanne; France: the Ecole Nationale Supérieure des métiers de l'image et du son), and six producers/broadcasters/publishers (the National Film Board of Canada, Canal Savoir, the Presses de l'Université de Montréal, Amsterdam University Press, Érudit and Idéeclic). http://technes.org.
4. http://www.cinemetrics.lv/; http://www.iri.centrepompidou.fr/outils/lignes-de-temps/.
5. Fairfax, 'The Impact of Technological Innovations'.
6. Including André Gaudreault and Martin Lefebvre (eds), *Techniques et technologies. Modalités, usages et pratiques des dispositifs cinématographiques à travers l'histoire* (Presses universitaires de Rennes, 2015); André Gaudreault

and Martin Lefebvre (eds), 'Cinéma & technologie / Cinema & Technology', *Recherches sémiotiques | Semiotic Inquiry*, 31, nos 1-2-3 (2011); Martin Barnier and Jean-Pierre Sirois-Trahan (eds), 'Nouvelles pistes sur le son. Histoire, technologies et pratiques sonores,' *Cinémas*, 24, no. 1 (2014); Richard Bégin (ed.), 'Écran : théories et innovations,' *Écranosphère*, no. 1 (Winter 2014); Nicolas Dulac (ed.), *Du média au postmédia : continuités, rupture* (Lausanne: L'âge d'homme, forthcoming).

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Gaudreault, André and Philippe Marion. *The End of Cinema? A Medium in Crisis in the Digital Age* [*La fin du cinéma ? Un média en crise à l'ère du numérique*] (New York: Columbia University Press, 2015).

About the author

André Gaudreault is professor in the Département d'histoire de l'art et d'études cinématographiques at the Université de Montréal, Canada Research Chair in Cinema and Media Studies, and director of the Canadian section of the TECHNÈS international research partnership. As of 1992, he heads GRAFICS (Research Group on the Emergence and Development of Cinematic and Theatrical Institutions), and from 1997 to 2005, he was head of CRI (Center for Research on Intermediality). In 2010, in collaboration with filmmaker, producer and visiting professor Denis Héroux (producer of *Atlantic City* and *Quest for Fire*), he founded at the Université de Montréal the OCQ (Observatory of Cinema in Quebec) whose objective is to support the research and studies on cinema in Quebec. His publications include *From Plato to Lumière: Narration and Monstration in Literature and Cinema* (2009) and *Film and Attraction: From Kinematography to Cinema* (2011); he has also co-authored *The End of Cinema? A Medium in Crisis in the Digital Age* (with Philippe Marion, 2015) and *Le récit cinématographique. Films et séries télévisées* (with François Jost, 2017).

Introduction

The Discursive Spaces Between a History of Film Technology and Technological Experience

Santiago Hidalgo

In recent years, a renewed, diverse interest in the history and theory of film technology has emerged within film studies. Culminating in the weeklong IMPACT (*The Impact of Technological Innovations on the Historiography and Theory of Cinema*) conference,[1] from which many of the chapters in this collection are drawn, and the founding of the inter-university TECHNÈS International Research Partnership on Cinema Technology,[2] this research encompasses not only the history and operation of the various devices that constitute the production and exhibition of film, but also the effect of these advances on cinema experiences, study, and theorization. This line of questioning thus involves examining the dialectical relationships that exist between the materiality of technology, its surrounding discourses, and the integration of these as an experience and enduring element of consciousness, which continually transforms the way cinema and the world is apprehended. It also involves, as several chapters in this collection show, a rethinking of the concept of film technology.

Research on film technology seems to follow at least two overlapping orientations, which because of their dialectical nature open unique discursive spaces for reflecting on the impact of film technology. The first concerns the materiality and operation of film technology. As Benoît Turquety writes in this volume, the concept of technology seems "to delineate the realm of the hardware-related." Perhaps the most classic example of this research is Barry Salt's *Film Style & Technology: History and Analysis* (1983), a detailed investigation of the machinery that constitutes filmmaking and exhibition (cameras, projectors, and so forth). This tendency has been present within film history from the beginning, with the first historiographies concentrating almost exclusively on the devices themselves.[3] The same technology involved in the production and exhibition of cinema can also invert the gaze back onto cinema, through the use of editing consoles or VHS players that enable the manipulation of standard film viewing (such as freezing frames).[4] At the other end of this same spectrum is the impact of these technologies on film style, as with Salt's work, but also on film theory, historiography, and experience, as with this collection.

The other research orientation disregards the primacy of the machinery and devices, focusing instead on the shifting and elusive conceptual and philosophical problems that film technology as a phenomenon creates. Does film technology 'exteriorize' something essentially human, such as language and perception?[5] Is the mechanical reproduction of images an epiphenomenon analogous to the mind-body problem?[6] How do technological innovations differ from inventions, especially in terms of the historiographic model that is brought into play?[7] The particular physical properties of film technology are obviously germane, but broader questions are more prevalent, such as an interest in defining the terms of the debate and establishing a common set of objectives for orienting film technology research. It is reductive to suggest this orientation is purely theoretical, since it necessarily involves combining historiography and investigations into material technological changes, but it is nonetheless useful to conceptualize it as a different ongoing conversation about film technology that accompanies and occasionally enters the other line of research.

While these orientations provide a first level view of the way film technology is addressed as an object of study, and which are present within each chapter to different degrees, there are other ways of dividing these areas of research. This collection favors situating the chapters along the continuum of experience, study, and theory. Such a thematic structure highlights particular details and questions shared in common between authors, such as concerns about the definition of cinema and technology, types of exhibitions, and the use of new technologies for film study, but also proposes a visualization of the film activities that build progressively towards film scholarship; an experience of cinema leads to a process of study and reflection and eventually theory.[8]

Experience

In its minimalism and excitement, the first receptions of film technology reveal a range of film experiences that define the encounter between audiences and film technology. As such, many of the most enduring questions about the technological experience of film are distilled. Comprising a spectrum of internal and external events, the notion of 'film experience' brings under a single rubric many diverse, overlapping perspectives on the impact of film technology. At one end of the spectrum, experience refers to 'observing', 'living through', or, as Francesco Casetti writes, the "act of exposing ourselves to something that surprises and captures us."[9] From

the outset, film technology was a source of fascination and discussion in the press, especially in terms of its unique nature. These accounts, as one expects considering Lumière's *Arrival of the Train* 'founding myth' (in which audiences presumably confused film projections for reality),[10] were accompanied with a sense of wonder, as illustrated in a *New York Times* account of the 23 April 1896 screening:

> The new thing at Koster & Bial's last night was Edison's vitascope, exhibited for the first time. The ingenious inventor's latest toy is a projection of his kinetoscope figures, in stereopticon fashion, upon a white screen in a darkened hall.[11]

Remarkably, the writer noted in a single sentence all of the distinctive features that separated this invention from its predecessors – it consisted of the "projection" of "kinetoscope figures" (films) in "stereopticon fashion" (projector) on a "white screen" in a "darkened hall." This moment fits with what André Gaudreault and Philippe Marion define as cinema's "first birth," which reproduced "in a rather servile manner the other media from which they are to greater or lesser degrees derived."[12] The program itself was described with little reference to its photographic nature, only noting of one view that the "motions were clearly defined."[13] It was the technology on display that attracted the attention, likened to the spectacular artillery of a modern warship, "[i]n the centre of the balcony of the big music hall is a curious object, which looks from below like the double turret of a big monitor."[14]

While the writer recognized the traits that made this technological experience unique, it was not yet a question of conceptualizing it as cinema. As Charles Musser argues in his chapter 'When Did Cinema Become Cinema? Technology, History, and the Moving Pictures', cinema is "understood to involve something more than a technology [...] not just a new technological system of projected motion pictures." This is more than a terminological, or technological question, it requires a dual vision, seeing the usage of the technology from the perspective of the time, in terms of its naming, conceptualization, and associations with other practices, while maintaining a historiographic view for moments of 'rupture' in the domains of industry, aesthetics, exhibition, and technology. There is also, of course, Musser's interlocutor in this argument, André Gaudreault's own attempt to answer this question in terms of the overlapping paradigms of "kine-attractography" (which captures the sense of 'cinema of attractions', without committing to the term 'cinema' itself, since it was not yet instituted as a term or idea)

and "institutional cinema" (formed in the 1910s),[15] which also represents the medium's 'second birth', a moment when it becomes more autonomous in its expression (such as through editing). Instead, Musser proposes the year 1903 as a key transitional moment, in part because it answers both questions. Firstly, it saw the implementation of the "three-blade shutter on motion picture machines/projectors." This innovation "sharply reduced the flicker effect" and thus "made spectatorship much more pleasurable." This roughly coincided with the shift towards narrative film – a defining feature of cinema for Musser – since "reduced flicker facilitated the kinds of pleasures one associates with fantasy and fiction" (Musser's argument identifies other key turning points that year, such as post-production shifting from exhibitors to film manufactures.) Secondly, after the initial rush of press coverage, such as with the *New York Times* piece, these years represent a moment of relative inactivity, and therefore obscurity, in terms of discourse about cinema. As such, it is "perhaps also a moment of profound realignment and reconceptualization." The proof, according to Musser, is that once publications dedicated to film emerged (around 1906), they seemed to already understand it differently, "as a special kind of theatrical entertainment rather than an extension of the lantern or a visual newspaper."

The definition of cinema is surely tied to technological innovations, new film discourse, and shifts from film attractions to narrative, but it is also, as Musser notes, connected to the architectural environment of the event, which is to say, 'the cinema', a space dedicated to film projections alone. The second chapter in this section, Jan Olsson's 'Exhibition Practices in Transition: Spectators, Audiences, and Projectors', examines technological features of "the theatrical experience," arguing that "moving-picture experience is shaped by the interaction between two fundamental components of the cinematic apparatus: the projector [...]and the film base." A comparative study between Swedish and American exhibition practices leads Olsson to consider the extent to which the experience of "forgetting the theatrical situation" – a psychological film experience – is tied to the technological apparatus of the projector. Early cinema projections, Olsson argues, contained far too many interruptions to become immersive, but the advent of the "two-projector model" and its "continuous projection" contributed to creating a modern sense of film experience (namely, without programmed interruptions).[16] By contrast, Swedish exhibitions relied on single projectors. Relying on extensive archival experience, Olsson draws a series of contrasts between these two distinct receptions, which ultimately support his contention that continuous projection contributes to a sense of concerted engagement. Olsson is careful to mitigate the

essentialism of his claim by examining other spectatorship conditions. American audiences, for example, were accustomed to a "brisk tempo between vaudeville turns," thus the immersive effect of the two-projector model was potentially magnified with this already "restless" audience. In Sweden, "the absence of vaudeville culture" suggests that "audiences were not primed for uptempo entertainment," and thus less likely to raise this theme in film discourse.

With this perspective in mind, a detail from the *New York Times* account now seems more relevant, alluding to the projection experience Olsson describes. As the lights dimmed on that night, a more muted, personal tone entered the writing, indicating a transition towards a more personal and subjective film experience. "When the hall was darkened last night [...] an unusually bright light fell upon the screen [...] on which appeared moving figures [...] about half life size." Not only was it an encounter with a technology, but also with a new life form; beings that resembled humans, but who were also unfamiliar and strange. In this context, the concept of film experience now refers to its most powerful and enduring venue – conscious experience – rather than only referring to an external or psychological event. Maxim Gorky's 'On a Visit to the Kingdom of Shadows' is a quintessential example of an anecdotal approach to the 'subjective film experience', the sensations, images, thoughts, and impressions that appear in consciousness during film viewing, becoming, in a sense, a private, embodied theater of the mind.[17] "This mute, grey life finally begins to disturb and depress you," recalls Gorky, "your heart grows faint [...] strange imaginings invade your mind and your consciousness begins to wane and grow dim."[18] While rare, these tendencies in early film discourse often remain the most memorable, providing a view of an otherwise inaccessible reality. It is a mode of writing that turns attention inward, to the elusive, formless matter that whirls around awareness without ever becoming specific or distinct enough to be fully mastered and understood. The *New York Times* reporter confronted the same problem in attempting to define the audience experience when he writes, "the spectator's imagination filled the atmosphere with electricity, as sparks crackled around the swiftly moving, lifelike figures."[19]Although used metaphorically, the 'crackling' of film projections remains one of the most recognized features of cinema's identity, especially in the context of digital cinema. As J. Hoberman recently wrote, "the essence of film – if not cinema – is not so much a matter of the photographic indexical as the presence of a material flicker [...]"[20] Audiences did not just single out the new film technology as an attraction, or passively submit to its performance. Rather, film gradually became enmeshed in consciousness in a way that was

difficult to articulate and dissociate from past mental experiences – requiring an attention to the subjective experience of film in order to identify.

André Habib's chapter, 'Reel Changes: Post-mortem Cinephilia or the Resistance of Melancholia', "stems from a cinephilic anecdote, a true, lived experience," an approach that addresses this enmeshed film consciousness, while combining Gorky's anecdotal spirit with the *New York Time*'s reporters recognition of the visceral experience of film projections. Since anecdotes include the narrator as part of the story, the subjective experience serves as a portal into the "hidden dimensions of cinema history," from which a more general truth or knowledge is potentially gained. In his repeated viewings of a 35mm print of Terrence Malick's *The Tree of Life* (2011), Habib recounts becoming obsessed with something that was "not even *really* part of the film," the cue marks that indicate a change of reel and "a moment of changeover between two projectors" (Habib's chapter emerges, then, as a modern day, subjective examination of the historical experience Olsson describes in his chapter). In noting this experience, the cue marks become "a secret mode of access to the film," since each reel seems to represent a coherent thematic element within a broader argument. This apparent technical flaw of celluloid projections, which disrupts the continuous psychological film experience, thus initiates a 'private' stream of thought that accompanies the viewing, but which is centrally concerned with the film itself (as opposed to, say, daydreaming). If the cue marks, which are specific to film projections, disappear, as with video formats, then it would seem that Habib has discovered one of those mysterious features of film, as opposed to digital video, that constitutes cinema (or 'the film experience' – an idealized rendering of that experience that is constantly under revision according to new technologies.)

The final chapter of this section, Dana Cooley's 'Walter Benjamin's Play Room: Where the Future So Eloquently Nests, Or: What is Cinema Again?' inverts Musser's questioning of the definition of cinema by examining the other end of the story – an analysis of experimental filmmakers who have expanded, through their creative usage of film and technology, our understanding of the concept of cinema. To this end, Cooley combines two concepts for revising our understanding of cinema's possibilities (and perhaps of cinema itself). Following Walter Benjamin's notion of *Spielraum* or 'playroom', Cooley envisions cinema as "a space for training our faculties," which includes the experience of "light, space, (e)motion, touch, memory." The concept of 'expanded cinema', coined by Stan Vanderbeek in 1965 and further elaborated in Gene Youngblood's 1970 work,[21] "privileges an embodied, sentient experience" that brings the viewer to "draw upon

personal experiences." These dual concepts open a discursive space for Cooley to explore technological innovations in experimental cinema that contribute to producing a "lived experience". Tracing a history from the early twentieth-century avant-garde to twenty-first-century digital technologies, Cooley illustrates the potential of cinema as "play room", as a means of "closing the gap between bodily experience and abstract representation." An example of this effect is Julius von Bismarck and Andreas Schmelas's *The Space Beyond Me* (2010), an installation that incorporates a modified 16mm camera that projects a UV light onto a wall coated with phosphorescent paint. Programmed to physically mimic the camera movements of found footage films, the projector leaves a "ghostly trace" connecting "past and present." In creating unique experiences, and combining elements of film technology from different eras, these 'playrooms' thus problematize the question of cinema, continuing the debate about its essential nature.

Study

About fifteen years after the first film receptions, and beyond the period of obscurity that Musser describes, was the beginnings of a more institutional film discourse appearing in film trade publications, both in North America and Europe. In spite of the trade format, and the interests and writing that normally fell within such a venue, writers nevertheless explored topics and writing styles antithetical to trade press objectives (such as 'impressionist' writing that offered no commercially useful information about the film).[22] These journals were not a formal place of study, but the deadline imposed on writers to produce film discourse on a weekly basis encouraged a practice of exploring film from different perspectives, even those that did not always make institutional sense (which is one reason early film criticism often seems 'alien' to modern readers).[23] It is simply a fact of writing, and of amateur writers aspiring to become critics, that it will occasionally become idiosyncratic. In such a dynamic environment, and with the complexity of cinema before them, early writers thus engaged in 'film study'. This gaze was directed not just at film, but also at the practice of writing about film, with dozens of articles published on the subject during these formative years.[24] Among their concerns was audience reaction to different exhibition contexts, such as the placement of particular films within a program and the location of the theater. Because early film critics relied heavily on audience opinion to form judgments about the commercial value of films, resolving the

mechanism of reception, and its range of environments, was of primary concern – otherwise critics could not be certain that the film was the main cause of a positive or negative reaction. In so doing, critics began to question aspects of the film experience – with one critic observing that, "after seeing a picture again under different circumstances," it was "impossible" to find "agreement."[25] The repetition of viewing, and the analysis of these unique experiences, as Habib's chapter illustrated, is a practice grounded in film study. It is from this tradition of self-reflection – of seeing film under as many different circumstances as possible – that the following chapters emerge.

This desire to take films apart and examine its components under as many circumstances as possible is precisely one of the endpoints of film technology that is then turned back onto cinema itself. David Colangelo's chapter, 'Hitchcock, Film Studies, and New Media: The Impact of Technology on the Analysis of Film', examines the "[v]iewing environments and operations available to film scholars throughout history," but especially the history beginning in the 1950s. Each format and technology (16mm print, projector, flatbed editors, VHS, DVD) provide scholars with a different set of parameters for studying shots and sequences, which subsequently determines film interpretation, and, over time, film theory. Colangelo uses Alfred Hitchcock scholarship to elaborate this hypothesis. Early analysis of Hitchcock's films, according to Colangelo, involved "frantic note taking in darkened theatres," a physical limitation that resulted in "relatively short reflections" focusing on "themes." By contrast, later scholars were able to use viewing devices, such as VHS, to open films to much closer inspection thus leading to "lengthy, visually detailed, close, personal readings of film structures and of signs and moments in Hitchcock's works." Colangelo's research illustrates the value of studying trends in film theory as partially related to technological innovations, rather than as strictly outcomes of institutions, schools of thought, or dominant academic theories (such as psychoanalysis, structuralism, or formalism). This simple, but powerful, difference in viewing environments, as Colangelo shows, enables the study of shots and editing in a way that was previously not available to scholars at a broad scale (and which is now the dominant form of film study, even in film history).[26] The impact on consciousness of new viewing technologies is also a question that Colangelo considers. As with François Albera's theory of 'cinematic episteme', which assigned film technology an anthropological dimension in its capacity to render a picture of the mind ("images flying past, jumping about and dissolving, shown simultaneously or in juxtaposition"),[27] Colangelo finds that "the compulsive repetition and fragmentation

facilitated by the digital technologies" has led to "a blended sense of time, texts, and memory."

If Colangelo's chapter shows us the three-fold impact of technologies on film scholarship in term of formal analysis, film theory, and conscious experience, Charles O'Brien's chapter, 'Film Analysis and Statistics: A Field Report', illustrates a similar causal relationship between a new technology – software for counting and computing average shot length – and its complementary methodology – statistical and quantitative analysis. Cinematrics is an online tool for manually registering, in real time, the shot lengths and scale of any film viewed on an independent system.[28] It will then provide a series of visualizations of this data, including average shot length, median shot length, and some of their relationships. This data can then be correlated to different types of scenes or sequences. O'Brien's study concentrates on musical films during the transition from silent to sound cinema in the early 1930s. Three types of shots – 'singing shots', 'dialogue shots', and 'action shots' – are then correlated with the average and median shot length for certain films from the period. By adopting a statistical view that incorporates a broad set of data, certain details that were previously invisible become apparent, in this case the discovery that actions shots were less than a third the length of singing shots. However, "statistical results merely drew attention to the singing-shot phenomenon," which, as O'Brien shows, requires "additional, non-statistical critical methods" in order to contextualize and interpret. Statistical analysis is thus not an end, but rather provides a first level orientation. It is up to the historian to fill in the blanks. In this case, O'Brien identifies a cultural logic that is particular to conversion-era musicals, "the fascination [...] with singing performances in electric-sound movies" at the expense of narrative economy.

The preceding chapters have shown the value of applying technological innovations to film analysis, but such innovations are also instrumental (as the digital humanities has proven generally) to the way historical sources and documents containing film discourse are studied and analyzed. Just ten years ago, century-old newspapers and journals were consulted largely by microfilm, which required hours of scanning to find relatively small samples of pertinent data. In selecting and writing about a particular item, the historian served as the guarantee that a specific discourse existed in the magnitude and character described. With the advent of digital copies of newspapers and journals, as well as optical character recognition technology and search engines like Project Arclight,[29] it is now possible to search such documents for key terms

or topics at a massive scale. This has led to the quantification of key terms according to period and regions, although these results can be meaningless without context (the term 'art' does not necessarily reflect a concept of art). The impact on discourse analysis is significant – where time and accessibility limited the number, periods, and regions of journals that could be searched, new digital tools enable the visualization of data beyond a local level.

Paul Moore's A 'Distant Reading' of the 'Chaser Theory': Local Views and the Digital Generation of New Cinema History', is an ambitious illustration of this approach, arguing that "recently digitized newspaper databases allow the digital generation of cinema historians to imagine revising the analog generation's conclusions." In this case, the conclusions Moore seeks to revise concern the relative standing of cinema during the 'chaser' period (when films presumably appeared at the conclusion of vaudeville acts to clear the room). Moore's analysis of digital newspapers relies on Franco Moretti's theory of 'distant reading', which brings attention to "units that are much smaller or much larger than the text" such as "devices, themes, tropes – or genres and systems." From this vantage point. "digital search results allow the structure of mass practices to be visualized." Like a pointillist painting, seemingly random data points viewed collectively reveal trends and connections that otherwise remained invisible. At a practical level, 'distant reading' involves a "geographic flattening, since newspaper items from any location are weighted equally," rather than favoring the main centers of film activity, such as Chicago or New York. In Moore's case, the precise approach consisted of searching documents from a specific period for keywords – such as 'cinema' (or rather, terms that refer to 'cinema,' such as 'moving pictures') and 'vaudeville' – and then comparing the coincidence of these results with those from the preceding and following periods in order to determine tendencies, such as relative interest in these phenomena. While Moore presents the caveats that such conclusions merit, the quantitative evidence seems to show that from 1898 to 1902 there was "a gradual decline of cinema within vaudeville" followed by "a steady increase" with the "emergence of the fiction film and the nickelodeon." As with O'Brien's study, the first level picture that digital technology offers is only a starting point for further inquiry – presenting a set of questions that then become the subject of more contextualized approach. The spike in films following 1903 is not explained as a function of narrative alone, Moore discovers, but also because of a transcontinental fascination with 'local views' shown by itinerant exhibitors, which increased during this period as well.

Theory

I would like to return briefly to the opening text and the *New York Times* account of the first reception to illustrate a further point. The intricate nature of the technology, consisting of countless material components (camera, projector, filmstrip, lab processing, lens, and so forth) of different historical origins, and a rather perceptually elusive operational effect (the illusion of motion, moving pictures), renders the film experience a linguistic and terminological challenge. The reporter named the film projected on screen "kinetoscope figures," in part because they were originally exhibited in kinetoscopes, but also because no other term for naming the phenomenon appearing on screen existed. The experience of engaging with the ontology of cinema includes a process of drawing on *figurative* language from other domains of reference in order to name the objects and effects implicated in the creation of cinema. In so doing, a concealed conceptual world about cinema is revealed. While this struggle was evident in all areas of early film discourse, as expressed in historiography, advertisements, instructional manuals, and eventually criticism, the process of finding a language for speaking about cinema was also one of the means through which cinema's nature was discovered. In applying a term, even improperly, a hypothetical question is raised – does the term actually capture the nature of the phenomenon, or are there aspects of the phenomenon that are excluded? Each application was therefore a process of experimentation – chaotic in the early years, as Hopwood's history shows – and must be regarded as a distinct film experience, independent of film viewing. While 'film language' (the means through which films communicate and produce effects) would eventually become a dominant question of film theory, it was the language routinely applied to film that determined its ontological nature, separating it from some technologies and practices, while forming relationships with others, as with the writer's description of the Vitagraph device as a magic lantern "stereopticon." In one utterance, the writer's moving picture cosmology is revealed. These instances are multipliable across thousands of texts from the period that similarly engage in the naming, renaming, and misnaming of film technology, producing a discursive space that constantly confronted – although indirectly – cinema's nature.[30]

Similarly, Tom Gunning's 'Cine-Graphism: A New Approach to the Evolution of Film Language through Technology', uses early film terminology as a means of opening a conceptual domain that reveals a fact about the moment, but also perhaps a more essential truth about film technology: "the names of the first cinema devices inscribe their relations to writing and

language" with "the suffix 'graph', appearing if anything more often than the visual 'scope'." Relying on the work of Leroi-Gourhan, Gunning argues that "the acquisition of language and then of writing represents an essential phase of human evolution extended into technological exteriorization." Since cinema is both an "image *and* a form of writing" and "neither in isolation" – as reflected in the graph and scope suffixes that seem to compete for cinema's early definition – film technology "exteriorizes" human processes of language and perception in a manner that renders them recognizable, "in a form of technological memory." This graphic means of communication differs from the tenets of early film theory that centered on the "articulation between shots" (as with Soviet montage theorists) as the fundamental element of film language. While not dismissing it, Gunning prefers to set that theory of film aside, in favor of seeing the other characteristics of film technology that operate as language. Cinema's graphic nature, which Gunning defines as a "non-semiotic, understanding of cinema language," highlights the relationship between writing and the "bodily rhythms" of gestures, which can be grasped without a grammatical structure. A shot expresses a recognizable meaning independently of its relationship with other shots. As such, film technology constitutes a "major transformation of our human world" and a "contribution to the relation between technology and human evolution," in the same way that writing was an exteriorization of human speech.

Vinzenz Hediger, in 'Can We Have the Cave and Leave It Too? On the Meaning of Cinema as Technology', complements Gunning's argument, in that it also attempts to isolate features of film technology that "shapes and makes what we call the human possible." Hediger's chapter is illustrative of the interdisciplinarity necessary to studying the impact of film technology on modern culture. Too elusive and dispersed to be captured within a single theoretical framework, Hediger draws on ideas and discussions from film and media theory, philosophy of technology, aesthetics, epistemology, and anthropology to address this question. One of Hediger's concerns is that we appear to face an impossible conundrum when studying film; the focus will be either on "technology or meaning, but never on both simultaneously." This split means that we are "forever missing out on the meaning of cinema as technology." The *New York Times* reporter's marked shift in tone when the apparatus of film suddenly came to life now finds another meaning: it was constituted in the experience of witnessing the material and the immaterial forever separated, the gap between them irreconcilable as objects of study; for each, a different language, a different speech. This follows, in a way, the mind-body problem of consciousness; film is an epiphenomenon whose

causal relation to the material apparatus is difficult to establish, resulting in competing epistemologies. Hediger appears to argue, by way of films that present philosophical arguments about artificial intelligence, that technology can carry an "unconscious knowledge about what a human being is" and which "in fact turns into a driver of self-consciousness." As when the *New York Times* writer observed "the moving figures" on the screen "about half life size," the recording capacity of film brought into relation the human and the inhuman within a singular graphic image that produced, precisely, a moment of "self-consciousness." It is at this level of self-consciousness, about the body and mind, but also the body and the world, that film technology inexplicably manages to render comprehensible an enduring element of modern consciousness. Likewise, Hediger's reflections on these themes offer an opportunity to revise our understanding of the way this complex relationship between film technology and consciousness has been addressed within film studies.

The final chapter of this collection brings into question some of the premises underlying this collection, laying the groundwork for the next stage, a historiography capable of integrating several orientations on film technology – towards the materiality of the 'hardware' and towards the changing conceptual terrain that renders these details meaningful – within a single, unified vision. In 'On Viewfinders, Video Assist Systems, and Tape Splicers: Questioning the History of Techniques and Technology in Cinema', Benoît Turquety adopts an at times pragmatic perspective, defining the terms that define the history of film technology. Drawing on debates within the Annales School, which focused on the concept of technology, Turquety's novel approach includes identifying the gaps between French and English definitions of the same term, in order to separate the semantic from the conceptual. For instance, in French "a 'technological innovation' will designate a transformation in the field of the *discourses* about techniques." However, "this may or may not correspond to a technical innovation, i.e. the apparition of a new machine and/or a change in procedures." The issue at stake for Turquety is whether technology should encompass both the technical (machine and procedures) and the discourses about these technical innovations, which seem, depending on the linguistic framework, to cloud the understanding between "innovation" and "invention," terms crucial to the drawing of cause and effect relations within the historical field. The former creates continuities, while the latter indicates disruptions. In the end, the distinction Turquety draws between these terms appears mitigated, or resolved, through other related terms, such as "arrival" or "adaptation." To the degree a new technology, such as a viewfinder, appears the result of a

series incremental adaptations over a period time, with consequent effects on filmmaking procedures, and even the very conception of film space, it should be regarded as an innovation that calls into play "investigations of the internal logic of the machine" and "the procedures it is involved in at a given time."

With cinema becoming ever more dispersed and problematic to identify in the digital age, the study of film technology offers a common ground for situating this phenomenon within an objectively physical universe, a discursive space from which to look backward and forward concurrently, to the historical margins that seem to share similar anxieties, concerns, and excitement about the place of this new – and constantly renewed – technology within culture, society, and consciousness. Collectively, the chapters gathered in this volume illuminate some of the discursive spaces opened in the study of film technology, providing a necessary, and complementary, perspective within film and media studies for understanding the impact of film technology on the many areas of academic and public life. They reflect the on-going questions and concerns occupying this new field of study and suggest new paths for further research and consideration in the domains of experience, study, and theory.

Notes

1. Organized by André Gaudreault and Martin Lefebvre in Montreal on 1-6 November 2011.
2. The Technès partnership combines the efforts of three research groups, GRAFICS of the Université de Montréal, the Dispositifs group of the University of Lausanne and the Arts pratiques et poétiques team of the Université Rennes 2, as well many researchers, archivists, and film institutions with the goal of examining more closely the techniques and technologies that accompanied the medium's mutations, from its rise out of the audiovisual practices of the nineteenth century to the present-day diversity of its forms.
3. This historiography started already in 1898 with Hopwood's *Living Pictures*: *Their History, Photo-Production, and Practical Working* and continued in trade journal articles, instructional manuals, and books. See Popple's 'Cinema Wasn't Invented, It Growed': Technological Film Historiography Before 1913', where he argues that a technological history emerged, in part, to "contain" the "complex mesh of histories" that the "mongrel technology" of cinema presented. Kessler and Lenk elaborate on early film historiography in 'L'écriture de l'histoire au présent. Débuts de l'historiographie du cinema', dividing it into four overlapping tendencies, The establishment of a genealogy, debates over first inventors, the incorporation of history in the

description of film technology (such as in instruction manuals), and the beginning of an aesthetic history.

4. See Colangelo's chapter in this volume, 'Hitchcock, Film Studies, and New Media: The Impact of Technology on the Analysis of Film'.
5. See Gunning's chapter, 'Graphism: A New Approach to the Evolution of Film Language Through Technology'.
6. This is my interpretation of one of the problems Hediger raises in his chapter, 'Can We Have the Cave and Leave It Too? On the Meaning of Cinema as Technology'.
7. See Turquety's 'On Viewfinders, Video Assist Systems, and Tape Splicers: Questioning the History of Techniques and Technology in Cinema'.
8. Casetti defines this second phase as "an 'act of reelaborating [experience] into a knowledge and a competence, so that we are then richer in the face of things, since we are able to master them ('to have experience')." Casetti, 'Filmic Experience', 56.
9. Ibid.
10. See Loiperdinger's detailed analysis of the misconstrued comments that likely spawned the 'train arrival' myth in 'Lumiere's Arrival of the Train: Cinema's Founding Myth'.
11. Anon., 'Edison's Vitascope Cheered' (24 April 1896), 5.
12. Gaudreault and Marion, *The End of Cinema? A Medium in Crisis in the Digital Age*, 106
13. The views included *Umbrella Dance*, *Band Drill, Walton & Slavin* and *Serpentine or Skirt Dance*. List taken from Charles Musser, 'At the Beginning: Motion Picture Production Representation and Ideology at the Edison and Lumière Companies', 27.
14. Anon., 'Edison's Vitascope Cheered' (24 April 1896), 5.
15. See Gaudreault, *Film and Attraction*: *From Kinematography to Cinema.*
16. Maxim Gorky had defined the film experience in 1898 in precisely these terms, as "forgetting where you are." Over a century later, IMAX, which magnifies the effects of the theater experience for more media-immersed spectators, also identified this as its most essential feature, evoking Gorky's second person style of address: "you're outside among the stars […] Sitting there, without the slightest doubt, convinced you're someplace else […]'
    'The IMAX experience', https://www.imax.com/about/experience/.
17. This is also an allusion to the 'Cartesian Theater' idea of the mind, in which conscious experience consists of an 'inner' consciousness observing images passing by on an 'inner' screen. Philosophers like Daniel Dennett strongly dispute this model of consciousness. *Consciousness Explained* (Boston, MA: Little, Brown and Company, 1991), 111.
18. Gorky, 'The Lumière Cinematograph', 25.
19. Anon., 'Edison's Vitascope Cheered', 5.
20. Hoberman, *Film after Film*, 10. David Rodowick draws a similar observation about the materiality and experience of film projections in his *Virtual Life of Film*, "when reproduced on an electronic or digital screen, 35mm original

may never fully realize the phenomenological density of time, pastness, and causality of the projected film experience," 109.

21. Youngblood, *Expanded Cinema*.
22. See Hidalgo, 'Early American Film Publications: Film Consciousness, Self Consciousness', for more on the variety of film discourse found in trade publications.
23. I am appropriating here Gaudreault's comments about early films and applying it to first discourse about film, when he writes of very early films as having an "alien quality" that raises questions about intention. Gaudreault, *Film and Attraction*, 36
24. Ibid., 131.
25. 'Commenting on the Films', *Moving Picture World* 8, no. 15 (15 April 1911): 814.
26. Matthew Solomon's close study of the drawings in the backgrounds of Méliès's *Voyage dans la lune* (1903) – which contain information potentially relevant to the interpretation of the film – has led Solomon to conclude that Méliès intended his film to be viewed at a much slower speed. Thus, the ability to stop films, and enlarge images, may result in discoveries that revise prior conclusions about film history.
27. *Ibid*., 131.
28. http://www.cinemetrics.lv/index.php.
29. http://projectarclight.org/. "Arclight is a data mining and visualization tool for film and media history that allow users to analyze millions of pages of digitally scanned magazines and newspapers for trends related to a chosen subject."
30. So abundant and bizarre were these names that Henry V. Hopwood (who categorized moving pictures as "living pictures") referred to the collection of names applied to film technologies as "etymological monstrosities." *Living Pictures*, 187.

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About the author

Santiago Hidalgo is a postdoctoral researcher and lecturer in film studies at Université de Montréal, as well as research coordinator of the Canada Research Chair in Cinema and Media Studies. He is editor (with André Gaudreault and Nicolas Dulac) of the *Blackwell Companion to Early Cinema* (2011). His work focuses on the history of film discourse and on defining the impact of film on consciousness, especially during the advent of cinema.

Section I:
Experience

1. When Did Cinema Become Cinema? Technology, History, and the Moving Pictures

Charles Musser

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Abstract
This chapter explores the technological and discursive conditions under which cinema attained its singular identity as "cinema." In contrast with André Gaudreault's paradigms of 'kine-attractography' and 'institutional cinema', which locates the emergence of cinema with the advent of institutional norms in 1910, the year 1903 is instead proposed as a pivotal moment in this process of definition. During this year, the three-blade shutter began its widespread integration within motion picture machines, which sharply reduced the flicker effect and created a more absorbing cinematic experience. When film discourse became pervasive in newspapers and film trade publications, "cinema" had already undergone a reconceptualization that granted it a new a status, that of cinema, separate from other media and practices.

Keywords: flicker effect, three-blade shutter, periodization, early cinema, film experience

When did cinema become cinema?[1] In some respects, the answer to this is obvious. One widely accepted moment is when the Lumière brothers showed their *cinématographe* in the basement of the Salon Indien du Grand Café in Paris on 28 December 1895. Although this answer might seem to result from narrow technological determinations – the invention of the *cinématographe* apparatus – this event is already technology plus several additional factors. We might hypothesize, then, some 'eureka moment' when the Lumière brothers first 'perfected' their new invention (perhaps on some dark stormy night), but such a moment seems to have

little traction in relevant historiographies. Moreover, the Lumière brothers had earlier public screenings, but it was the one at the Grand Café, at which an admission fee was first charged, that many argue constituted cinema's true 'beginning'. Cinema is understood, at least implicitly, to involve something more than a technology – not just a new technological system of projected motion pictures, but one that, from the outset, involved projection onto a screen in a theatrical setting of some kind with a paying audience.

Cinema, then, is also different from the first commercial modern motion picture system – the kinetograph-kinetoscope – introduced by Thomas A. Edison on 14 April 1894. Here, again, its beginning is traditionally tied to the opening of a Kinetoscope parlor at 1156 Broadway NYC – not to the demonstration of Edison's experimental model on 20 May 1891, or the demonstration of a prototype on 9 May 1893 at the Brooklyn Institute of Arts & Sciences. Edison's motion picture system was a crucial antecedent for cinema not only in terms of technology, but also for the generation of a distinct set of motion picture practices. Conceptually, the application of projection (in particular, a projector with an intermittent mechanism) to Edison's motion picture system or some similarly constructed system c. 1895 made possible the essential components of cinema. This also acknowledges that the Lumière debut at the Grand Café must share honors with other screenings in other countries when it comes to the generation of motion picture practices, including the Lathams Panoptikon/Eidoloscope and the Thomas Armat-C. Francis Jenkins Phantoscope, which debuted at the Cotton States Exposition in October 1895, but was quickly ended by a fire only to re-emerge five months later as Edison's Vitascope. Other motion picture systems developed c. 1895-1896 include the Cinématographe Joly, the Biograph, and Gaumont's 60mm motion picture system.

Although historiography continues apace on this flurry of initial commercial projections, it has not led to a revival of pre-Brighton Conference/pre-1978 arguments over firsts, but neither has it closed off discussion about the origins of 'cinema'. To answer the question 'When did cinema begin?', we must first answer the *a priori* question, 'What is cinema?' Inherently, this question also asks what is not cinema. If cinema is defined as 'projected motion pictures in a commercial, theatrical setting', a variety of motion picture practices are clearly not cinema. Cinema excludes devices such as Edison's peep-hole kinetoscope, the Biograph company's mutoscopes as well as soundies from the 1940s. It also excludes press screenings such as the one for Edison's Vitascope at the inventor's laboratory on 3 April 1896,[2]

and the projection of advertising films onto buildings or makeshift screens in large cities, which became common in late 1896 and 1897. Already in the 1890s and early 1900s, many US exhibitors, such as Lyman Howe, showed films in churches and parish houses, offering theatrical entertainment at a time when important Protestant groups saw theater as a sin. Looking to a later period, there was also a large non-theatrical market for motion pictures, such as the use of educational films in schools and libraries. College film societies in the 1960s and 1970s were certainly considered part of the non-theatrical market, but they did their best to emulate the experience of cinema. Screenings in auditoriums and lecture halls often have enough of the attributes of what we consider cinema that to exclude them entirely would require a rigid purism. I continue to insist on classroom screenings of films because they provide an experience that is much closer to that of cinema than watching the same work on a computer, in which the experience is constantly interrupted as the user stops to check email or a news aggregator such as Google News or Facebook – not to mention speeding through a DVD in order to get the film's gist. Hollywood now offers digital cinema, screened in theaters via a Digital Cinema Package (DCP). For Hollywood, the theatrical experience remains key to subsequent marketing formats (television, internet video screening, Blu-ray, cell phone apps, etc.) even if, as Francesco Casetti argues, cinema is, in some sense, relocated and persists in these various delivery systems.[3]

This definition of cinema, which I have tended to use in my own scholarship, is only one of several possible ways of conceiving of cinema. For instance, in *Film and Attraction*, André Gaudreault argues that "the fundamental rupture in film history was not the invention of the moving picture cameras in the 1890s [...] but the constitution in the 1910s of the institution 'cinema', whose primary principle could be seen as a systematic rejection of the ways and customs of early cinema."[4] This idea of a decisive moment in film history, which occurred around 1910, is something Gaudreault shares with other film scholars. Dudley Andrew states that "the cinema came into its own around 1910 and it began to doubt its constitution sometime in the late 1980s."[5] Andrew is consciously echoing Edgar Morin, whose book *Cinema: Or the Imaginary Man* (1956) has a chapter entitled 'Metamorphosis of the Cinematographe into Cinema', which Gaudreault also mentions.[6] Morin seems to think that those in the industry made films without worrying about its role as an art until roughly fifteen years after the cinema started, i.e. 1910.[7] To the extent that we treat *Cinema: Or the Imaginary Man* as a historical text, it is worth asking if it escapes the problems of other histories from that period. (I would suggest that it sometimes fails.)

Moreover, although becoming an art and becoming an institution may (or may not) be related, they are hardly the same thing.

As Lee Grieveson noted at the IMPACT film conference,[8] according to the *Oxford English Dictionary*, the term 'cinema' became popular in the United Kingdom over the course of 1910. Recall Virginia Woolf's most famous pronouncement: "On or about December 1910 human character changed [...] All human relations have shifted – those between masters and servants, husbands and wives, parents and children. And when human relations change there is at the same time a change in religion, conduct, politics, and literature."[9] Did this change occur most of all in the cinema itself?

Not everyone sees 1910 as the magical year. In the second volume of Jacques Deslandes and Jacques Richard's *Histoire Comparée du Cinema*, entitled *Du Cinématographe au Cinéma, 1896-1906*,[10] the authors suggest that the *cinématographe* had become *cinema* by 1906 – not 1910 or 1915. Their chosen year is loosely linked to Gaumont's incorporation (on 1 December 1906) and related phenomena, such as the rise of storefront or specialized motion picture theaters know as nickelodeons in the United States, penny gaffs in England, Kintopps in Germany – and cinemas in France. It is a moment when cinema gains a certain weight and its own infrastructure.

All this perhaps signals a larger historiographic problem of periodization. For instance, Gaudreault's so-called birth of cinema 1 or (the *cinématographe*), which he increasingly considers a minor event in its history, produced the cinema of attractions era or that of kine-attractography, which lasted until 1903 (or perhaps 1906 or 1908), followed by the birth of cinema 2 or its institutionalization occurring around 1910 (or perhaps from 1910 to 1915).[11] According to Bordwell, Staiger, and Thompson, this culminated in the establishment of the Classical Hollywood Cinema (its further institutionalization?) somewhere around 1917 with the establishment of the Hollywood system of representation.[12] Another important watershed is the emergence of Hollywood's vertically integrated studio system around 1920 and its new global dominance. These various and sometimes fluctuating dates are one sign that periodization floats between several different levels and needs to be assessed more carefully. That is, we need to reground this historiography in a stronger understanding of (broadly conceived) motion picture practices as they go through a series of interconnected transformations.

In the spirit of this persistent idea that cinema proper was subsequently constituted out of some earlier moment or formation in the history of cinema – what Gaudreault calls 'the birth of cinema 2' or what might, more neutrally, be called Cinema 2.0 – I want to return to the question 'When did cinema become cinema?' and be particularly sensitive to the role of

technology in providing an answer. Of course, one problem here is that there are several transformational moments over the course of cinema's history. For instance, some (perhaps including André Bazin) might want to associate Cinema 2.0 with the coming of sound, while some contemporary media scholars might identify Digital Cinema as Cinema 3.0. In that case, Gaudreault's birth of cinema 2 might be Cinema 1.4 and 1.5.[13] These debates involve questions of 1) naming – I prefer to avoid applying birth metaphors to historical transformations; 2) periodization – what are the important moments of transformation or development and, ultimately, what are the most decisive or salient ones – or, in the case of Gaudreault's 'second birth', the salient one? And 3) the kind a history we are writing – is it a history of films (Gerald Mast et al.), a history of film production and representation (Bordwell, Staiger, and Thompson), a history of the screen, a history of photography, a social and cultural history, a history of media, or a history of motion picture practices? The latter engages both the mode of representation and the mode of production as they interact, but it also understands cinema production not only to include film production (what was called 'negative production' in the early 1900s), but also exhibition and spectatorship, as well as various interstices such as distribution, advertising, and promotion. Of course, historians often write more than one simultaneously, though they generally privilege one over the other. Good cinema history, nevertheless, is also immersed in a larger cultural and social history.

What Gaudreault calls the 'birth of cinema 1' (or Cinema 1.0) is largely determined by the bringing together of technological innovations into what really constituted a system of inventions. Assuming the answer to the question 'When did cinema become cinema?' is not simply 1895-1896, and that we are looking for a new and decisive formation, a hypothetical Cinema 2.0, there are many possible answers. The history of cinema as an art and the larger social and cultural ramifications that result from these changing formulations are interesting and important. I find it difficult to imagine a decisive moment either in 1910 or even in 1910-1914. The process of institutionalization can be difficult to define precisely – and identifying a decisive moment of institutional emergence seems fraught. These issues seem particularly dynamic within what has often been called the transitional period of proto-classical cinema (from c. 1907-1908 to 1920), with the formation of the classical Hollywood vertically integrated studio system. Certainly, there are compelling reasons to argue for a new Cinema 2.0 in the wake of World War I, when American cinema asserted its global dominance. However, if we look at cinema practices in the first decade of the twentieth century, before 1910, there are at least three possible moments when we

might say that Cinema 1.0 became Cinema 2.0 – or, to drop computer-age terminologies– when cinema became 'cinema':

(1) In 1908, cinema became a form of mass communication – and thus mass entertainment and mass culture – with the introduction of the regular release schedule and an emergent mode of representation that was more accessible and consistent in meaning to a broad range of spectators (through the use of intertitles and a strong linear narrative organization of shots).[14] This coincided with efforts to organize the film business in all its aspects through the Association of Edison Licensees and the then Motion Picture Patents Company, with related efforts in Europe. It was also at this moment that film (or 'negative production') moved away from a partnership model of production towards a hierarchical, military style or corporate chain of command and responsibility.[15] The 'director' emerged, with Griffith as an early and notable example. Moreover, it was at this moment that many motion picture companies began to build their stock companies of actors. In addition, again in the US, the *New York Dramatic Mirror* started reviewing films, suggesting that, from an outside but closely affiliated perspective, films could be judged on the basis of their artistic merit. I should add that when I started to use the term 'early cinema', I was referring to the period up to this moment of transformation. Indeed, this conforms to the emergence of what Tom Gunning calls the 'narrator system'.[16] Likewise, Gaudreault refers to this as a new post-monstration era of narrative integration. So, here is a glimmer of coincidence – though our rationales for focusing on this date seem quite different, as does the importance Gaudreault and others give to it.

This remarkable, far-reaching transformation happened as a more or less direct result of another earlier moment when one might argue that cinema became cinema:

(2) I have remarked that "[i]t is not too much to say that modern cinema began with the nickelodeons."[17] Here, my term 'modern cinema' might be seen as 'cinema 2'. It was in 1906 that the nickelodeons provided the motion picture industry with its own specially designated exhibition sites. To have specialized motion picture houses or cinemas but no cinema seems odd. This is the Deslandes-Richard date. Of course, any date always involves a certain amount of wiggle room. For example, the nickelodeon boom was getting underway in places such as Pittsburgh and Chicago in the second half of 1905, but not in Denver until 1907. And the US is just one instance in a global system. Thus, the boom in specialized motion picture theaters started in the Philippines in 1902-1903! Nevertheless, despite this geographic privileging, 1906 seems the critical year.

This rapid proliferation of movie houses – and the movies needed to show there – was possible or greatly facilitated by another earlier moment of reorganization.

(3) Anything characterized as a second birth should be something quite momentous. We should be talking about the wholesale reorganization of the dispositive or cinematic practices, when there was a convergence of multiple changes that put motion picture practices on a new footing. Moreover, it should be a moment when cinema becomes, in some sense, 'cinema'. Is there such a moment – one that might at least rival 1908 or 1920 but is somehow more appropriate? I believe there is: the year 1903 – when a series of interconnected changes occurred in the *dispositif,* at least in the United States. What were these, and what was their relationship?

The Year 1903

The year 1903 involved a multifaceted, far-reaching reorganization of the *dispostif* that needs particular attention.[18] Moreover, it is important to note that this included an essential, though often overlooked technological component: the introduction of the three-blade shutter on motion picture machines/projectors, which sharply reduced the flicker effect and made spectatorship much more pleasurable. Its use was widely advertised by traveling exhibitors in the US in the second half of 1903, and must have been widely and almost simultaneously adopted among those motion picture companies competing for outlets in the nation's leading vaudeville houses. The three-blade shutter was a component of larger reorganizations of cinema practices, which, taken together, formed a transformational moment that, arguably, had no equivalent in its far-reaching nature. It did not determine this change, but rather was an integral and perhaps essential component of it.

Before 1903, post-production was largely under the control of the exhibitor. Indeed, film programs were not strictly speaking *film* programs. Most so-called film exhibitions involved the cutting back and forth between slides and film. This was not only common, it was desirable and, in some sense, necessary. In October 1896, Biograph was already alternating between titles slides and motion picture films.[19] Title slides provided the spectators' eyes with respite from the heavy flicker of projected films; and since motion picture film stock was expensive, it also reduced the costs of materials. By late 1896, and with increasing frequency thereafter, purveyors of illustrated lectures were giving evening presentations in which they alternated

between slides and film with something like a 4:1 or 6:1 ratio. Until 1903, exhibitors of motion pictures typically included slides in their programs. After 1897 or 1898, apparatuses for projecting films were generally combination stereopticon-moving picture machines that allowed operators to swivel the image carrier back and forth as they alternated between the two media. This meant that post-production was no longer under the ultimate control of the exhibitor: the process of assembling material into a coherent program was physically occurring in the course of exhibition. What we now call editing – the juxtaposition of shots to create meaningful connections – was under the control of the showman. (Of course, the exhibitor was also responsible for the sound – music, effects, narration and so forth.) Certainly, there were times when producers or production companies took on such editorial responsibilities (increasingly from 1899 onward) and the exhibitor acquiesced. Porter's *Jack and the Beanstalk* (1902) and Méliès's *A Trip to the Moon* (1902) are two such examples, and neither had intertitles. More often, exhibitors would assemble a group of short films and combine them into programs that might offer a miscellaneous collection of views or a program that offered thematic and/or narrative coherence. It was not unusual for programs to be somewhere in between. The surviving paper print of Edison's *Jack and the Beanstalk* does not have a head title, but this does not mean that the film was shown without one. Exhibitors used a title slide to introduce the film. If the work can be said to include the title, we must conclude that the film was only a part of a larger work (in the case of *Jack and the Beanstalk*, easily the largest and essential part) and that the title slide varied from exhibitors to exhibitor – along with the sound accompaniment. Films were thus only building blocks or units for larger programs.

The year 1903 was the pivotal moment when editing and other elements of what is commonly called 'post-production' moved decisively from the responsibility of the exhibitor to the production company in key areas. Even as the three-blade shutter was introduced in the United States, the Edison Manufacturing Company began to sell its longer films – *Uncle Tom's Cabin* (July 1903) was the first – with head titles and intertitles. Because the three-blade shutter reduced flicker, it became more viable to show filmed titles rather than title slides. Likewise, the cost of film was decreasing thanks to other, more modest technological innovations that reduced the time for perforating film as well as for printing of film positives. Key elements of post-production thus became rapidly centralized inside the production company – a process that had begun somewhat earlier, but had been impeded by well-established exhibition procedures. (Obviously, this shift applies to the projected image, and not to sound.)

The centralization of post-production inside the film manufacturing company had a profound impact on exhibition. Until 1903, an exhibitor provided venues such as vaudeville houses with a full service that included an operator, projector, slides, and films. Now that titles were on films rather than separate slides, projectionists were now simply showing a reel of film – a noticeable reduction in their responsibilities and skill levels. These old-line exhibition services, notably Percival Water's Kinetograph Company, became distributors who rented a reel of film to the vaudeville houses (and probably sold them a projector in the process). In many cases, the vaudeville houses gave the role of projectionist to the house electrician. Again, this occurred in the later part of 1903. This, in turn, produced a new pattern of distribution – the rental system – in which the reel of film became a commodity.

It was also at this moment that narrative fiction began to dominate in vaudeville and elsewhere. In *The Emergence of Cinema*, I traced the kinds of film subjects that were being featured in Chicago vaudeville houses in 1903 using newspaper advertisements. The shift in subject matter was quite dramatic: roughly 20 per cent of the headline attractions were fiction or acted films early in the year, and this percentage had increased to roughly 80 per cent by the fall.[20] There were multiple reasons for this shift to story films, but reduced flicker certainly facilitated the kinds of pleasures one associates with fantasy and fiction. The moving picture houses that soon followed could then be given names such as Bijou Dream and Dreamland. This shift also meant that lanterns were redesigned just to show films: they became motion picture machines. While perhaps not the only moment when we can argue that 'cinema became cinema', the year 1903 was a decisive moment, as, practically for the first time, projectionists in vaudeville houses and elsewhere only showed films as part of their programs. While before mid-1903 cinema was a screen program that typically included both slides and films, after mid-1903 cinema was constituted as a pure film program. Although there were lots of old film without head titles, this transition may have happened surprisingly quickly. Old-line distributors often had their own filmmaking capabilities and could have easily shot head titles on film and cut them into their reels of film. (In fact, even into the nickelodeon era, distributors sometimes replaced head titles supplied by production companies with their own as a way of claiming ownership if not authorship.)

Finally, there is the consideration of theory, of changing conceptions of cinema, of its ontology. What is cinema? As André Gaudreault and Philippe Marion suggest in their talk 'Measuring the "Double Birth" Model against the Digital Age', cinema was initially seen as a special kind of magic lantern. Here, we are certainly in agreement. In *The Emergence of Cinema*, I wrote:

The *Optical Magic Lantern Journal* of November 1896, for example, observed that 'The greatest boom the lantern world has ever seen is that which is still reverberating throughout the land – the boom of living photographs'. In *Animated Pictures* (1898), C. Francis Jenkins wrote:

> It has frequently been suggested that the introduction of chronophotographic apparatus sounded the death knell of the stereopticon, but with this opinion I do not agree. The fact is, the moving picture machine is simply a modified stereopticon or lantern, i.e. a lantern equipped with a mechanical slide changer. All stereopticons will, sooner or later, as are several machines now, be arranged to project stationary pictures or pictures giving the appearance of objects in motion.

These observations were echoed by Henry V. Hopwood in *Living Pictures* (1899): 'A film for projecting a living picture is nothing more, after all, than a multiple lantern slide'.[21]

During the year 1903, cinema was largely invisible in the press – at least, there was little said about what was going on in vaudeville houses. If very little was said about the nature of cinema, it was perhaps also a moment of profound realignment and reconceptualization. When the discourse resumed – indeed, once story films were clearly dominant within the industry, the cinema was newly conceptualized as a special kind of theatrical entertainment, rather than an extension of the lantern or a visual newspaper. The appearance of film reviews in the *New York Dramatic Mirror* in 1908 offers one piece of evidence. From this point forward, at least for many years to come, comparisons between stage and screen would do much to structure theories of film.

These different moments when cinema became not 'the cinema', but a new kind of cinema (a new formation distinct from what it had been only a few years before), should not obscure the fact that the moment when cinema (Cinema 1 or 'the *cinématographe*') first appeared was one of fundamental importance and impact. In *Film and Attractions*, Gaudreault argues:

> My hypothesis is that 'cinema' was not invented in 1890 by Thomas Edison and W. K. L. Dickson with the Kinetograph, nor by Auguste and Louis Lumière in 1895 with their Cinématographe, nor by an other supposed inventor of cinema. The only things invented by those who are generally

> recognized as having invented cinema were the devices to make cinema. It is a subtle distinction, but the device used to make cinema is not the same as cinema itself.[22]

As one of the presumed 'partisans of Edison' (though they go unmentioned by name),[23] I find it essential to be clear and therefore reiterate my position. There is no question in my mind: *Edison neither invented the cinema, nor the device to make cinema.* Cinema is, in my opinion, projected motion pictures in a commercial, theatrical setting: this is what the Lumières did with their *Cinématographe* – not just by 'inventing' the machine, and developing an entire motion picture system that was an alternative to Edison's, but by utilizing that machine for commercial purposes inside a theater. Edison and Dickson invented a motion picture system that relied on the peep-hole kinetoscope to exhibit films and was *a pre-cinematic device*.

The distinction between the invention of the device that can produce cinema and the cinema itself is a tricky one. The device could be invented but not given commercial application (a possible example is Louis Le Prince) Then, clearly, there is no cinema. Or, it could have been used only for scientific purposes *à la* Jules-Etienne Marey – in which case, no cinema. But this did not happen. Exhibitors introduced it into theatrical settings almost immediately (even prematurely from a technological viewpoint if we consider the Lathams' Eidoloscope). But one might argue – and this seems to be Gaudreault's point – that even though it was put into theaters, this new media form was not transformative; it remained little more than an extension of previous 'pre-cinematic' practices; its impact on culture and social life was similar to what already existed; it was a novelty that was not so different from the pre-cinematic peep-hole kinetoscope. I must strongly disagree. Between late 1895 and 1897, cinema emerged as a new phenomenon, a new worldwide cultural force. In an essay I wrote for another Gaudreault anthology, I detail cinema's transformative impact in the United States on sports, religion, politics, theatrical culture, the newspaper, and American courting rituals between April 1896 and the end of 1897.[24] The appearance of this new media form has often been relegated to the status of 'novelty'. Indeed, I have been as guilty as anyone in referring to 1896-1897 as cinema's novelty period in the United States. As too often happens, I am afraid, the naming of a phenomenon can conceal as much or more than it reveals. *Mea culpa*. Even so, this sense of novelty – of something fundamentally and importantly new – was widespread and garnered widespread comment and attention wherever it first appeared. Certainly,

there were important continuities, but transformative moments always involve continuities as well as ruptures.

Second Birth = Institutionalization?

Although I have suggested a number of crucial moments in the ongoing transformation of cinema before 1910 – moments when one might argue that cinema became more recognizably 'the cinema' – I don't want to privilege any one of them. In this respect, I align myself with Yuri Tsivian who remarked that "in the course of cinema's history what cinema is has changed enough times for a history of the cinema's identities to be written."[25] Of course, there were a number of innovative developments over the course of the 1910s that should not be overlooked. The year 1912 saw the full maturation of the one-reel film and the emergence of the feature film, often starring the world's leading stage actors. By 1915, traditional production companies in the US were no longer making profits from their short films, and feature film exhibition was entrenched with its own standardized release schedule. With Charlie Chaplin and Griffith's *The Birth of a Nation*, film achieved a new level of recognition as an art form, while the first important books on film appeared. Bordwell, Staiger, and Thompson have asserted that the Classical Hollywood cinema's mode of representation was in place by 1917, while the vertically integrated studio system was a reality by 1920. Each of these can be said to mark a notable shift in cinema's identity, though it should be pointed out that there never was and never has been any periods of extended stability. Even in the 1920s, the introduction of synchronized recorded sound meant tremendous change and upheaval.

What, then, constitutes the institutionalization of cinema – this "fundamental moment of rupture in film history"[26]such that we should separate cinema into two periods: a kind of new 'pre-cinema' in which the cinematic butterfly was not a butterfly but actually a caterpillar, and the moment when the butterfly burst forth from its cocoon? This underlying issue seems underexplored in *Film and Attractions* where a formulation by Lucie Robert is offered:

> [A]n institution is a 'normalization system' which is structured in order to 'produce in its area of influence, certain particular forms of behavior'. In other words, as Clement Moisan puts it, an institution is made up of a 'set of codified practices'.[27]

Or, as Gaudreault puts it, "[t]ime was required – a minimum amount of time, for production of codes and norms – and thus the interpretive codes and norms – to appear or if you prefer, to be instituted."[28] But codified practices of some kind and degree were always in place. They did not so much come into existence as they changed. This is one of the problems with the birth metaphor. (Though the birth metaphor typically uses the pathetic fallacy for which the human rather than the butterfly is the subject of such a birth). Editing, for instance, was neither invented, nor organically appeared from nowhere. It existed before cinema in well-developed lantern practices – the juxtaposition of images created by the sequencing of slides. The exhibitor was often both programmer and editor – two roles that were not clearly differentiated. It was only in 1903 that these roles became more clearly distinct as key elements of post-production – specifically, editorial control – shifted into the production company and concentrated creative control in one place – while programming resided with the exhibitor. Even so, as Richard Koszarski and Ross Melnick have shown, in the 1920s showmen sometimes re-edited a film so that it would conform to time constraints and have its artistry or entertainment value enhanced – still seeing it as part of their prerogatives of showmanship.[29]

Even though codes, norms, and practices changed, in crucial respects they were in place from cinema's very beginning. Why? Because cinema's beginnings *did not constitute a birth*, but a transformation of existing practices – or a powerful collision, a dialectical synthesis of nascent motion picture practices that came out of photography with well-established magic lantern/stereopticon practices. Certainly, the realm of cinema was much smaller in 1896-1897 than in 1915, and its practices had changed radically over that intervening period. Certainly, elements such as film gauge lacked standardization. Certainly, it was associated with a wide range of entertainment forms (vaudeville, the circus, magic shows, road shows, lantern shows, and more). Nonetheless, the reality of cinema as a technological practice was that this technology demands that its practitioners operate within rigorous constraints and norms. This was particularly true for production – both negative production and print production. Although the width of motion picture film might have varied from one motion picture system to another, within each system the format had to conform to quite rigorous standards. The protocols for making a film print from a film negative were every bit as severe and elaborate in 1896 as they were in 1910 or 1920. In fact, they had just become much more efficient and, in some sense, simpler and more routine in 1920. For the technology to function, indeed for cinema to even come into

existence, this required not only an *appareil* (a technical apparatus) but a *dispositf* – that is, a practice with its own distinct protocols.

From the outset, these practices and protocols were distinct in ways that set themselves apart from prior practices in photography and the lantern – which themselves had already constituted a powerful nexus. It is worth noting that at least in the United States during the second half of the nineteenth century, this intersection of photography and the lantern had been widely seen as a kind of emergent media form called the stereopticon.[30] That is, the stereopticon as a practice, formation, and media form was conceived of as photography plus a new improved lantern with a stronger light source and sharper lenses. In this, it was very similar to the cinema, which can be defined as motion pictures plus lantern projection (in a theatrical setting – but this is something else).

The stereopticon obviously failed as a media form while the cinema has enjoyed much greater claim to this status. The question is why? Among other things, the stereopticon ultimately proved to be just another version of the lantern platform (the magic lantern). Its lantern could also show painted slides, slip slides, slides with messages that had been typed on a typewriter, science slides with specimens sandwiched between the two pieces of glass and so forth. This is at least one of the reasons why its identity as a media form encountered substantial resistance and ultimately fell apart. Initially, cinema had similar structural vulnerabilities. As already mentioned, Edison's Projecting Kinetoscope or Lubin's Cineograph also functioned as a stereopticon in the late 1890s and early 1900s, as they showed both slides and films. Once again, these slides involved a variety of media. For instance, title slides were often hand-painted on glass. So, when people saw a turn of motion pictures at Proctor's 23rd Street Theater during the Spanish American War, they saw more than just projected motion pictures – perhaps more than projected photographs (both still and animated). Motion pictures were clearly dominant – they were the official attraction – but this was an impure cinema. Thus, once again the importance of cinema's new identity after 1903. The reel of film that became the standard offering for the system of film exchanges that quickly spread across the United States and the world after 1903 was both a commodity and a pure, new form of cinema. It was a critical step in the establishment of cinema as a newly self-contained practice and media form.

Notes

1. I would like to thank André Gaudreault, Martin Lefebvre and their associates for organizing a wonderful conference at La Cinémathèque Québécoise in Montreal, where a version of this essay was first presented. After some thought, I decided not to revise that presentation into some impersonal, polished article, but to keep the spirit of what was said while pursuing modest but appropriate refinements. At the conclusion of this presentation in Montreal, André took off a few articles of clothing but stopped well before decency required a halt, which may suggest a certain failure on my part to overcome some of our different perspectives.
2. *New York Journal*, 4 April 1896, clipping, MH-BA.
3. See Casetti, *The Lumière Galaxy*
4. Gaudreault, *Film and Attraction*, 34.
5. Andrew, *What Cinema Is!*, xiii.
6. *Ibid*., xiv.
7. Morin, *The Cinema*, 48.
8. Organized by André Gaudreault and Martin Lefebvre in Montreal on 1-6 November 2011.
9. *Woolf*, *Mr. Bennett and Mrs. Brown*, 4-5.
10. Deslandes and Richard, *Histoire Comparée du Cinéma, vol. 2.*
11. Gaudreault offers two periods before institutionalization, which occurs around 1915. The first – the system of monstrative attractions – goes to 1908. The second, "the system of narrative integration" (Gaudreault, *Film and Attraction*, 53) or the proto-institutional period, goes from 1908-1914. (Gaudreault, *Film and Attraction*, 90).
12. Bordwell, Staiger and Thompson, *The Classical Hollywood Cinema*.
13. If we consider cinema in the context of the long history of screen practice, we might want to consider the initial formation of cinema in 1895/96 as something like Screen 4.0 (to take a somewhat arbitrary number).
14. See Musser, *Before the Nickelodeon*, 372.
15. Musser, 'Pre-Classical American Cinema'.
16. Gunning, *D. W. Griffith and the Origins of American Narrative Film.*
17. Musser, *The Emergence of Cinema,* 417.
18. Le Gac, 'Questioning the Word "Dispositif": Note on the Translation', 11-14.
19. 'A Moving Picture of M'Kinley'.
20. Musser, *The Emergence of Cinema,* 338.
21. Ibid., 15.
22. Gaudreault, *Film and Attraction*, 5.
23. Ibid., 33.
24. Musser, '1896-1897: Movies and the Beginnings of Cinema'. See also Tsivian, 'The Rorschach Test of Cultures'.
25. Tsivian, 'What is Cinema?', 755.
26. Gaudreault, *Film and Attraction*, 34

27. Ibid., 67.
28. Ibid.
29. Koszarski, *An Evening's Entertainment,* xx; Ross Melnick, *American Showman*.
30. I examine this in Musser, 'The Stereopticon and Cinema: Media Form or Platform?', 129-160.

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About the author

Charles Musser is Professor of American Studies and Film Studies at Yale University, where he teaches courses on film and media historiography, American cinema and documentary film (both critical studies and production). His books include *The Emergence of Cinema: The American Screen to 1907* (1990), *Before the Nickelodeon: Edwin S. Porter and the Edison Manufacturing Company* (1991), *High-Class Moving Pictures: Lyman H. Howe and the Forgotten Era of Traveling Exhibition, 1880-1920* (with Carol Nelson, 1991), *Edison Motion Pictures, 1890-1900: An Annotated Filmography* (1997), and *Politicking and Emergent Media US Presidential Elections of the 1890s* (2016). He also co-edited *Oscar Micheaux and His Circle: African American Filmmaking and Race Cinema of the Silent Era* (2016) with Jane Gaines and Pearl Bowser, and directed the feature-length documentary portrait: *Errol Morris: A Lightning Sketch* (2014).

2. Exhibition Practices in Transition: Spectators, Audiences, and Projectors

Jan Olsson

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Abstract
This chapter discusses the overlaps and differences in how film audiences encountered feature films – projected in one stretch or via breaks for reel changes. By charting the trade discourse, the text shows that American film theaters gradually adopted a two-projector system during the early to mid-1910s and thus screened multi-reel feature films without pauses. In contrast, Swedish film theaters retained the one-projector model with breaks well into the 1920s, and some did not switch over to two projectors until the breakthrough for sound. This non-uniformity for exhibition practices challenges notions about a hegemonic regime for audience absorption in the engagement with the story world. Breaks during projection clearly offset such a mindset and instead offered modes of intermittent and distracted engagement in fictions presented as recorded rather than just given.

Keywords: projectors, early audiences, film experience, Swedish cinema, exhibition practices, early cinema

The theatrical moving-picture experience is shaped by the interaction between two fundamental components of the cinematic apparatus: the projector (one of cinema's 'hardwares') and the film base (a 'software' of sorts) divided into reels on which images have been registered. By primarily riveting the attention to the 1910s, the manners in which films, and mainly multi-reel features, were screened, with or without pauses between reels, will be elucidated via the trade press. Exhibition practices, in this the most basic sense, define the premises for the film experience and, in turn, theories of spectatorship, which additionally are framed by such dispositive factors as theater location and architecture, marketing and

programming, musical accompaniment, the level of light in the auditorium, Jim Crow practices or other forms of seating segregation, etc. I will focus on two national cinemas for comparative purposes: cinema in the US, as 'Hollywood' gradually turned into a dominant model for storytelling during the 1910s, and Swedish cinema, which was a miniscule film environment in terms of local production and heavily depending on American imports, especially after the onset of World War I.[1]

The American exhibition market exploded in the wake of the nickelodeon boom leading to the regulation of the market after the formation of the so-called Edison Trust, based on a pooling of patents. These licensed companies soon ran parallel to an independent production conglomerate and both gradually operated from the West Coast and from what, with geographical license, we now collapse into the notion of Hollywood. Numbers apart, American cinema is one of the best documented due to its rich trade discourse, which here will be used for gleaning pertinent information concerning basic features of the movie-going experience. Indirectly, however, as a backdrop for the professional discourse from the perspective of the booth, as it were, one can extrapolate useful information regarding how audiences experienced films in the auditoria in the most bascic sense: with or without breaks during reel changes, with or without light in the auditorium during projection. My claim here is that theories of spectatorship seldom address such experiential issues.

Much of the theory concerning the theatrical experience has been developed from an American perspective, most influentially in Miriam Hansen's scholarship regarding spectatorship and, in a later phase, her theory on the vernacular; that is, how other cinemas came to emulate salient aspects of the classical Hollywood model, albeit with a local inflection spelled out in terms of the vernacular.[2] The unrivaled analysis of the classical (Hollywood) model is Bordwell et al, (1985).[3]

In order to analyze the correlation between aspects of production and film exhibition, I have singled out one national production and its exhibition enviroment to compare against the dominant American one, namely, the Swedish. This choice is not arbitrary or grounded in my own citizenship, but due to the fact that no other country can offer such a level of systematic material documentation concerning the pivotal factor for my analysis, reel length. The background for this is the Swedish censorship system that measured every reel from every film copy that was screened in Sweden after December 1911. Thus, the problem this essay hopes to clarify is whether the American production/exhibition model had a vernacular counterpart in Sweden with minor modifications only, or whether the Swedes operated on

a different protocol that also affected the exhibition of imported American titles. At the heart of this matter is the extent to which the model of spectatorship posited by Hansen and others enjoyed a universal application as a lingua franca for film experience and whether it needs to be vernacularly qualified. That is, from the perspective of exhibition practices, was cinema in Sweden 'speaking' in a different tongue – or just with a bit of an accent? The Swedish censorship documentation makes it possible to ascertain how American features were translated in material terms, i.e. if they were modified concerning reel length and if the number of reels for the same amount of footage was adapted to fit into a local system for exhibition.

The critical factor for ushering in spectatorship in the feature era, in the sense defined by Miriam Hansen's landmark research, was a collective forgetting of the theatrical situation and a blocking out of the exhibition context for a full-fledged mental investment in the story world and its characters via identification or alignment with the projected camera work. The posited experience resulting from such a generalized mindset was filmic rather than cinematic, at a time when the term photoplay gradually gained currency. This utterly privatized address, if we accept the premise, circumvented the publicness of the theatrical event by suppressing local and personal contingencies due to the configuration of narrative devices and strategies designed to mentally pull patrons to the threshold of the diegesis.[4] How this came about, or not, was, arguably, also a consequence of how films were projected and how the cinematic interaction between hardware and software played out in the theatrical space as film style and narrative met audiences. A shift of focus away from abstract spectators to corporeal audiences and patrons pushes the analysis from pure theory to the perhaps not-so-uniform historical exhibition practices. The comparative approach here is designed to address these issues by way of the trade discourse supplemented with newspaper accounts.

Breaks, Pauses, and Waits in the Trade Discourse

Scholarly discussions concerning both the US and other national cinemas seemingly take for granted that films, at least features, were projected continuously from booths equipped with two projectors and without breaks between reels, unless the films were excessively long, say *Birth of a Nation* in twelve reels. In such cases, the films were divided into sections, acts, or parts with one or two intermissions matching the legitimate theaters breaks between acts.

Scant research has been devoted to the many variations in projection practices in the 1910s. Especially if we also take into account vernacular models for film exhibition outside the metropolitan landmark venues for first-run attractions in the US.[5] Scholarly exceptions to the lack of attention to the dialectics between the one – and two – projector models for screening are Ivan Klimes' analysis of screen practice in Czechoslovakia and Ben Brewster's discussion of multi-reel titles on the American market as a backdrop for his analysis of *Traffic in Souls*.[6]

The trade discourse concerning pauses and breaks, waits and delays during exhibition bears on the many strands of film culture and its historiography and metapsychology and it is correlated with exhibition and programming at large. My thesis is that the analysis of filmic interpellation and spectatorship needs to be supplemented with insights into actual exhibition practices, picked up via fragments from the trade discourse in lieu of informants. As will be evident, the practices were not ushered in or negotiated in a uniform fashion, not in the US, and especially not in several European countries.

Scholars allow for an extensive period of negotiation in the US before classical cinema was fully codified in a decade-long and far from teleological reframing of the medium and filmic storytelling.[7] Arguably, these extremely convoluted processes should not be read top down from the make-up of films only. We need to take into account the full panorama of exhibition practices and the phalanx of local factors influencing them, hence the turn to studies of local exhibition the last decade or so.[8] The physical properties of theater architecture, the regulatory framework stipulated by city ordinances and state laws as well as their policing, and how exhibitors – metropolitan, suburban, and rural – presented their programs for their patrons are critical factors to consider. Such constraints and variations are key issues for understanding film experiences in their diversity.

Here, the attention is limited to the impact of interrupted screening between reels. Severing of immersion at regular intervals in the projection between reels strongly militated against the unencumbered psychological and ideological investment in the diegetic world posited by theories of spectatorship. An uninteruppted, continuous screening of a feature offers a very different experience than if the mental investment in the story is suspended by recurrent breaks.

Charles Musser was one of the first to argue that in the early days, before the nickelodeons, the showmen, and exhibitors played a decisive role for programming within the context of screen practice.[9] The gradual standardization of the product, as analyzed by theories of spectatorship,

however, did not always work in smooth tandem with a standardization of the presentation in local exhibition practices.

Hence, several aspects of film exhibition, and especially two at times interrelated practices, militated against the forgetfulness and experiential delocalizing Hansen defined as a *sine qua non* for spectatorship. Namely, the breaks in projection between reels when screening multi-reel titles, and so-called daylight screening with some level of lighting in the auditorium during projection. Individually or together, these prevalent practices grounded and localized the film experience. Apropos light, which I have discussed elsewhere, Hugo Münsterberg elaborated on its relation to immersion:

> Stage managers [in legitimate theaters] have sometimes tried the experiment of reducing these differences [in lighting levels between hall and stage], for instance, keeping the audience also in a fully lighted hall, and they always had to discover how much of the dramatic effect was reduced because the feeling of distance from reality was weakened. The photoplay and the theater in this respect are evidently alike.[10]

Given breaks in projection and/or auditorium light in the mid-1910s, the sense of place and theatrical awareness were, in many ways, heightened and thus perhaps even stronger than around 1908, which I will return to. Daylight screening, adopted to prevent mashers from operating in the dark as well as policing consensual interaction, seems to at least partly undermine and offset the absorption required for a sense of private connection to the screen and story world, if we side with Münsterberg's contention. The rationale for adopting light ordinances was to facilitate patron surveillance by supervision and policing from theater staff, which redefined the spatial awareness in multiple respects. Daylight screening was therefore correlated with a heightened interpersonal perception, binding patrons to a shared theatrical situation during projection. In the spring of 1913, the so-called Folks ordinance was adopted in New York City and, subsequently, a bill from Senator Griffin spread it across the state. This ordinance included one of the most detailed regulations of light in the auditorium:

> Every portion of the motion-picture theater, including exits, courts, and corridors, devoted to the uses or accommodation of the public, shall be so lighted by electric light during all exhibitions and until the entire audience has left the premises, that a person with normal eyesight should

> be able to read the Snellen standard test type 40 at a distance of twenty feet and type 30 at a distance of ten feet; normal eyesight meaning ability to read type 20 at a distance of twenty feet in daylight. Cards showing type 20, 30, and 40 shall be displayed on the side walls together with a copy of this paragraph of the ordinance.[11]

In his *Cyclopedia*, published in 1911, David Hulfish describes how American picture theaters operated by offering a series of examples from model theaters.[12] On top of his exhibition pyramid was the 'Large Exclusive Picture House' situated in the shopping district in "one of our largest cities." Theories of spectatorship run in smooth tandem with experiences for patrons in such venues. Hulfish's model house offered three first-run reels and two illustrated songs with three programs change a week and operated fourteen hours per day. The booth was equipped with two film projectors and one projector for the slides. In terms of projection, the slides blended into the tailpiece of the first reel and the second reel blended into the last slide. After the continuous and mixed program follows a short intermission. Seemingly, all titles here were one-reelers. Hulfish wrote before the debate about daylight screening took off. Clune's Broadway Theater in Los Angeles operated exactly along the lines outlined by Hulfish.[13]

Similar exhibition practices were in place in Cleveland already in 1909: "All theatres in the downtown section are using two machines [...] there being no delay in the shows from the time the door are opened until last

Fig. 2.1: Clune's Broadway Theater, Los Angeles. Published in *Moving Picture World*, 23 December 1911, p. 985.

performance at night."[14] This mode of operation was, however, in no way representative for exhibition practices at large in 1909.

The bulk of the American discourse on pauses and breaks and on one or two projectors can most conveniently be gleaned form F.H. Richardson's columns in *Moving Picture World*, which later turned into a handbook in several editions, the first one from 1910.[15] Judging from Richardson's column from 3 July 1909, it is evident that two alternating machines were already in use in some theaters, which the Cleveland note claims. Richardson offered advice on how to arrange the electrical wiring to best serve the reel change between projectors.[16] Seemingly, the model from Cleveland's downtown houses spread rapidly or was adopted more or less at the same time in many metropolitan areas. For example, it was reported that the Lyric Theater in St. Louis had "two machines and operators working constantly" in 1911.[17] The rapid establishing of the two-projector model as default in many first-run houses in the US is clear from Richardson's detailed response to a letter from California in August 1910:

> There is just one thing I do not understand about this letter. Apparently this house is running with but one machine, else why speak of 25-second changes? If this is so it certainly is a matter of surprise. In a house such as is described there should be two machines, with one spare mechanism, and the pictures should dissolve one into the other, the helper starting one machine as the end of the film appears which is running on the other. By this I mean the second machine should be started before the picture on the screen has entirely run out, thus dissolving the title of the new film into the tail-piece of the one running.[18]

As European multi-reel features began their inroads into the American market at this juncture, exhibition practices were discussed in passing in trade journals and mainly from the perspective of metropolitan venues on par with Clune's booth resources. The review of the Danish film *Ved fængslets port* (*Temptations of a Great City*, Nordisk, 1911), published in June 1911, is a case in point as the reviewer argues for a Clune-like exhibition practice matching the highly integrated narrative of European multi-reel features: "The interest is so strong that one actually becomes impatient while the reels are being changed. We would advise exhibitors to use two machines, if possible, when showing this film."[19]

Evidencing a gradual change in exhibition practice in tune with this proposal as a burgeoning market for features took off, a reviewer, again in passing, praises the novelty of continuous projection without breaks after

the opening in New York City of the spectacular Kinemacolor production of *Delhi Durbar*. The film was screened at the New York Theater in March 1912:

> The exhibition was remarkably smooth; it had been carefully rehearsed and much praise is deserved by those who supervised the details of it. Two projection machines were used. One picked up where the other left off with such nice precision that the pictures were thought by many to be one long continuous film.[20]

A comment in *Moving Picture World* from June 1912 weighed in on changes in exhibition practices in more general terms:

> The number of motion picture theaters discarding their intermission slide is steadily on the increase. No recent innovation in the conduct of the exhibiting business has found favor with the public so quickly and widely. Nothing is more tiresome than a long wait between reels.[21]

This 'recent' innovation can be attributed to a gradual relaxing of one-reelers as default commodity in the US and the increase in import of multi-reel titles from Europe, which exacerbated novel exhibition strategies, not that all imports were projected without breaks and not that everybody approved of the novelty.

'The Film Man' in *New York Dramatic Mirror*, for example, was considerably less enthusiastic than the writers in *Moving Picture World* in this regard in December 1913:

> The possession of two machines and the chance to rush the programme through and get rid of those patrons whose dimes are already in the till, leads many an exhibitor to danger by showing a four of five reel film without a break. Of course there are some patrons who will complain against too many long waits. But here should be a medium between no waits and too long waits. Two reels and even three may be shown continuously without danger, but when you see, as I did on Broadway last week, a six-reel melodrama [*Traffic in Souls*] without a pause in the unfolding of the film, then I defy any men to have more than a feeling of weariness at the close. The average feature film loses much of its effect when shown to the physical torture of the spectator.[22]

From a historiographic standpoint, the discourse around the wait, the pause, the break, and discontinuous projection has mainly been ignored

in the transitional blending of different regimes of cinema irrespective of periodization and its labels. The quilt of simultaneously co-existing exhibition practices outside the biggest metropolitan houses, attested to by my small roster of examples below, evidences non-uniform practices and a gradual shift to the two-projector model and continuous projection. This lack of uniformity should not be eliminated from our understanding of how film experiences were negotiated in the 1910s. Examples from only the grandest of venues gleaned from the trade discourse are hence not indicative of a brisk and universal shift from one to two projectors in US theaters overall.

In early 1913, for example, an itinerant showman (Geo. L. Wilson) writing from West Virginia claimed that he had toured "this state and N.C., S.C. and Va." with the Sarah Bernhardt films. "I find few up-to-date operating rooms; only one house, The Virginia, Charleston, using two machines."[23] An exhibitor from North Dakota claimed in early 1914 that he had "two machines in the booth to do away with the long waits or rather any wait [...] As near as we can find out, we are the only house in the State running two machines."[24]

Reflections on how audiences may have reacted to the innovation were recorded in passing by exhibitors in trade columns about projection: an Ohio exhibitor described his method in the spring of 1913: "We have no stops or intermissions, and find the people like it much better than waiting for reel changing, while looking at advertising slides."[25] A Texas exhibitor claimed a year later, May 1914: "Intermissions of three minutes after every thousand feet were the custom some time ago; nowadays it is nothing unusual to run a four reel feature without any intermission, and there has been nothing from the public except commendation."[26] The Aerodome, Buntington, Indiana, was outfitted with two machines in mid-1914, since the management "believing an audience dislikes intermissions during which the change of films take place."[27] And from Kentucky in the fall of 1914:

> We have long discarded the habit of showing pictures in separate sections. We run the multi-reels as one continuous reel, never allowing the 'part one, etc.,' to show. We have often been accused of only running three reels where we really had four. We never allow advertising slides to interrupt our performance, running these after each show when we have an intermission of two or three minutes.[28]

These examples from the trade discourse evidences several different models simultaneously in play across the US during the fist half of the

1910s, but a gradual shift to the two-projector model and continuous projection pushing outwards from the first-run metropolitan houses to smaller houses in small towns. Several small-town and rural theaters still continued to operated with only one machine and changed to two projectors very late. Jeff Kleontic has shown that the Strand Theater in Milford, NH bought its second projector in 1920: "With the new equipment and two machines there will be no delays between reels. Heretofore there has been a short delay after a reel was shown before the next one could be loaded. The enterprising proprietors will do away with even this slight annoyance."[29]

Sweden and the One-Projector Model

I'll return to US theaters after a detour to Sweden and an exhibition context mainly unaffected by the discourses concerning breaks, pauses, and waits during the 1910s. Key question when we move to Sweden against the backdrop of the American discourse: how much awareness of the theatrical context can audience members experience and still remain in the realm or zone of spectatorship? This vexing concern is particularly relevant as multi-reel titles were much more common here than in the US in the early 1910s in theaters invariably operating with only one projector throughout the 1910s. To reiterate: If the homogeneity of the storytelling's address posits a uniformly fixed position via a complex mechanism of obliviousness delocalizing the viewing subject and propelling her or him into the diegetic world by bracketing the awareness of the theatrical situation – what happens when this process is temporarily suspended by default due to wait between reels, a practice lasting well into the 1920s in Sweden? In the light of such a model of exhibition, do we need to modify our conceptualization of spectatorship in the vernacular context of Swedish film exhibition (and in many other similar exhibition cultures) and regard it as deferred or diffused based on the universal one-projector model, which, in turn, had repercussion for local production practices?

In a flippant sketch on Stockholm's film culture published in 1912, the author notices that the audience does not seem to mind multi-reel features making up the entire program. The author himself, in contrast to what is available at theaters proper, only bemoans that alcoholic beverages are not served in the intervals in the projection. "The movies have to contend themselves with a youngster parading the aisles during the bright-lit intermissions offering printed programs and candy."[30]

This succinct description paints an exhibition model with time enough for selling programs and candy during bright-lit intermissions for reel change. The information is otherwise scant regarding what went on in the intervals. Apart from the sale of programs and candy here, advertising slides are quite regularly mentioned in the US discourse, and presumably there was music. And the breaks seemingly lasted from 25 seconds up to three minutes per the American examples above – unless it was a regular intermission.

The very first indication of a Swedish booth with two projectors that was actually used for continuous projection of features was at Palladium in Stockholm, which opened on 26 December 1918. In the meantime, presumably due to the lack of alternatives practices, I have found no complaints, and no discourse concerning breaks and pauses. Appraising the novelty, technical authority Axel Waldner wrote:

> Each performance consists of circa 2,300 meters and as the magazines takes 600 meters, the machines are alternating. The switch [...] was executed with such a precision, even if taking place in the middle of the drama, that it was absolutely unnoticeable by the audience unless one was looking at the rear of the auditorium and the ports in the wall.[31]

It's clear from this article that projection from alternating machines was an absolute novelty. News traveled slow in Sweden, the old one-projector model thus held its own also after Palladium's innovation. The year before, a Swedish trade reporter had familiarized the readers of *Filmbladet* with American exhibition practices in a celebratory account from a show at Samuel Rothapfel's Rialto in New York City. From the long article, the passage about the booth reads:

> Here, like everywhere in America [with some exception, as noted], two projectors alternate; one starts at as the other runs out of film. In this manner, a long feature in five or six reels melts together, given the audience the proper overall impression and the audience is oblivious regarding how many reels the film consists of. This exhibition practice is superior to our domestic method with many superfluous pauses.[32]

An editorial in the trade paper *Filmbladet* in late 1920 offered the most circumspect discussion of the pros and cons of breaks in the projection, and there's no mentioning of the existence of the type of the two-projector model demonstrated at Palladium:

> Audiences seem to prefer short breaks, some would even forego them to have the film screened uninterrupted. For many spectators, the mechanical chopping up of the film in projection adversely affects the mood of the film… [For example] The first act ends with a tender scene between lovers. On the cusp of the kiss, the first acts ends, the auditorium is awash with light, the candy sellers run between the aisles, doors slam, people come and go, and musicians tune their instruments. Suddenly the lights are dimmed. On the screen is flashed Second Act, perhaps the film's title, director, and studio. And soon the film continues. Same environment, same people, and the kiss, annoyingly interrupted by the pause, is delivered […] Neither we, nor the audience, allege that a 90-minute feature should be screened uninterrupted. That would be a too strenuous endeavor for a majority of the spectators.[33]

A few years later, in 1922, a critic described her frustration with the many breaks when attending a downtown theater with her husband:

> After a long newsreel, came a *long* pause. Thereafter a topical film, fairly interesting, followed by a *long* pause, and then a musical interlude. After yet another *long* pause, we were finally treated to the feature, the apogee of the program. It was superior and beautiful. But due to all the waiting, the long pauses, the old and longish newsreel, we were pushed to such a state of impatience and disappointment that we both vouched nevermore to visit this theater.[34]

The trade discourse in passing recorded the slow inroads of the two-projector model of exhibition. In 1925, one of Stockholm's second-run, independent theaters, Odéon, was refurbished. And according to a trade commentary, "Odéon will be a luxury venue. Two projectors will be put to work – this means no pauses."[35] In 1926, Swedish Film Industry's second-run house, Sture, was up for a makeover. After a press screening, one of the Stockholm dailies reported that "the booth has been equipped with two projectors, which means that the program can be screened without pauses between acts just like at Röda Kvarn, Palladium, and Skandia."[36] Skandia had opened in September 1923 and came with two projectors. As surprising as this might seem, Stockholm theaters apart from this select trio of showcase places that had shifted to two projectors sometime during late 1918 and 1923, presumably operated with only one projector close to the end of the silent era.

Sweden's leading architect for picture theaters, Axel Stenberg, comment on the light requirements in realtion to reel changes in a talk

delivered in June 1923. At this time, only Röda Kvarn and Palladium operated with two machines; Skandia opened in September. According to Stenberg,

> It's advisable not to fully illuminate the auditorium during pauses for reel change in order not to shatter the mood certain good films instill in the audience. It's better to preserve a certain dimness up until the film has ended…Those theaters that have alternating projectors, must hence be recommended as good models.[37]

Some theaters outside Stockholm also adopted two projectors in the mid-1920s, for example Palladium in Malmö.[38] In the wake of the exhibition changes in the mid-1920s, the technical trade paper *Filmteknik*, lauded a double projector marketed by the German brand Nietsche, Z.S.IV. In addition, the company offered a regular machine with 1,200-meter cassettes taking four American reels. The rationale here was "the audience's steadily increasing demand for shows without annoying pauses between reels." The double machine was presented as an alternative for small and mid-size theaters with room for only one projector.[39] This is in 1927. A veteran projectionist, Oskar Pettersson, with 55 years of experience in the booth, claimed in a summation of his career, that "the last years of the silent era saw considerable improvements in the equipment – one was a shift over to the two-projector model to be able to run without intermissions."[40]

The Swedish exhibition practices was part of a larger network bearing on domestic film production and the distribution of non-Swedish films, particularly American features. A critical aspect of this network of practices was the flexibility and absence of a fixed standard concerning reel length. This facilitated the correlation between production and exhibition practices with narrative breaks strategically placed between reels without a pre-set industry standard for reel length. The American standard of 1,000 feet corresponds to 305 meters. Since many Swedish reels (locally produced or reformatted American titles) were very long it was necessary to have large-size magazines. Inventory lists from Swedish booths in 1914 thus list magazines for either 400 or 600 meters. Pathé, for example, sold three sizes of magazines already in 1909, at 300, 400, and 600 meters.[41]

When writing on French director Paul Garbagni's Swedish film *In the Springtime of Life* (1912), I noticed how symmetrically the film synchronizes its two major temporal leaps in the narrative, a decade each and advertised by intertitles, with the film's two reel changes.[42] The leap in the narrative is

thus correlated with the break in exhibition. Obviously, the film is in three reels, with almost identical length per reel – real one is 343 meters (1,125ft), while both reel two and three are 378 meters (1240ft). The two breaks, a decade long in the narrative and a minute or so in the auditorium, prompted questions about both production practices at large in the company's new studio at Lidingö. Garbagni was brought in to teach the newly hired Swedish directors, af Klercker, Stiller, and Sjöström, the tricks of the trade. Given Garnagni's model example, did it become standard practice at Swedish Biograph to organize multi-reel features so that each reel was somewhat standalone in nature in order to mirror current exhibition practices?

As mentioned, the archival records from the Swedish Board of Film Censors are uniquely rich for scholars interested in material evidences in this respect. On the inspection cards (available at the National Archives – Riksarkivet), and there's one for each distributed title from 1911 through the silent era (and on), the censors meticulously noted the length of each reel and also when additional copies were sent in for stamping. The inspection cards for Swedish Biograph's features released in 1913 compared to the reel length for the imported *Traffic in Souls*, just as an example given this film historiographic status and that it was produced the same year, evidence interesting differences in this respect.

Traffic in Souls, which was inspected on 2 September 1914 and came in six standard-size reels at 328, 321, 291, 312, 319, and 303 meters, a total of 1,875 meters. In this case, the film was not reformatted by the Swedish distributor, but screened with the original reel length intact, albeit with breaks during magazine changes. Presumably, magazines taking 600 meters and thus two reels were used; this meant two breaks. If we look at the Swedish features produced at Swedish Biograph in 1913, the reel length is less consistent. *The Miracle*, for example, came in five reels measured at: 395, 485, 450, 401, and 314 meters and a combined length of 2,045 meters. This five-reeler is thus 200 meters longer than the six-reeler *Traffic in Souls*. *Ingeborg Holm* was measured at 438, 410, 388, 361, and 409. The five reels combined for 2,006 meters, before a scene was removed by the censors. *Blodets röst* was 1,826 meters and the reels were 484, 508, 479, and 355. The four reels here are more or less as long as the six for *Traffic in Souls*. Reel two for *Blodets röst* at 508 meters or 1,666 feet is the longest of all the Swedish reels from this year.

Blodets röst is particularly relevant as its manuscript was printed by the studio in a brochure as an exemplary guide to screenwriting, 'How a Film Manuscript Should Be Written'.[43] The preface admonishes prospective screenwriters that "each act or part should preferably attach itself

to a limited moment in time." In the period 1912-1916, and heeding this advice, Swedish Biograph favored stories straddling considerable time spans emplotted so that the reel breaks featured clear temporal or spatial shifts, sometimes both, and often marked in calendar fashion – Y Months Later or X Years Later.

Hugo Münsterberg argued for the elimination of intertitles in his 1916 book, after comprehensive film viewing the year before, albeit with

> two apparent exceptions [...] It is not contrary to the internal demands of film art if a complete scene has a title. A leader like 'The Next Morning' or 'After Three Years' or 'In South Africa' or 'The First Step' or 'The Awakening' or 'Among Friends' has the same characters as the title of a painting in a picture gallery [...] In this sense a leader as a title for a scene or still better for a whole reel may be applied without any esthetic objection.[44]

Discussing American production practices and wastefulness in the use of film stock, Louise Reeves Harrison indirectly formulates a corresponding rationale between production and exhibition practices when lauding a novel system of planned shooting evidenced by one particular, unnamed title:

> The scenes were timed in advance, so that the end of each 'act,' or reel, contained an element of suspense, due consideration being given to the fact that all exhibitors are not provided with two projectors. There must be tension of interest to hold an audience during an enforced wait.[45]

The Swedish flexibility concerning reel length inspired reformatting of imported American titles to bring down the amount of reels and thus the corresponding amount of breaks in projection. A swath of American titles in five reels, especially from Triangle but also other producers, was turned into to four reels by Swedish Biograph and thus had fewer breaks for the same amount of footage. For one title, Triangle's *Martha's Vindication*, the censor commented on the discrepancy on the inspection card: "the [film's] main title says five acts, but the film is only in four."

Birth of a Nation offers an excellent example of the reformatting practice. The Swedish program leaflet advertised the film as in twelve parts, which was true for the American version. When inspected by the Swedish censors, the film had been reformatted to eight very large reels and the newspaper ads for the screenings talk about three parts and eight acts; acts here meaning reels. In contrast to the twelve standardized American reels, the Swedish ones were all bumped up to lengths from 418 to 506 meters. After

the opening, one reviewer complained that the intertitles sometimes were illegible due to the brisk projection speed for this crammed program lasting 2.5 hours. The film was 3,500 meters after the censor had cut 100 meters in the second part. The submitted 3,600 meters divided into eight reels, otherwise correspond to the American original's twelve reels at 300 on average.

The Swedish model for production, distribution, and exhibition was thus highly integrated and all its components were put in the service of the one-projector model. Before returning to the US, a few fragments indicate shifting practices across Europe; more research is no doubt called for.

When visiting France in 1913 an unimpressed W. Stephen Bush wrote back that:

> [o]utside of these show places [the largest houses in Paris], however, the projection in Paris was generally poor and the pauses between the reels about ten times longer than even the most patient of our audiences would endure without plenty of hostile demonstrations.[46]

A letter to F.H. Richardson's column, also from 1913, reported from that Moscow has about

> 800 to 1,000 theatres [...] the very largest only seating about 200 to 300 and are nearly always on the second floor. As yet, there are no theatres here that can boast of having two machines, the nearest approach to this being two separate halls on the same floor with a separate machine for each. Half the program is shown in one hall and the audience then saunters into the other for the remainder.[47]

Films in Copenhagen were seemingly shown with only one projector just like in Stockholm. A photograph from a downtown booth late 1912 thus shows only one machine and the accompanying article is in singular throughout.[48]

From London, in contrast and in 1914, two projectors were seemingly at work in most theaters:

> The usual duties of the operator consists of running the machine, looking after the motor generator, fans, inside lighting, flame arcs, etc. An assistant is provided to rewind, etc., and if he has had any experience and has been with you for some time he runs the projector on alternate reels. Nearly every house has two projectors, which are run alternately.[49]

Let us now return to the US.

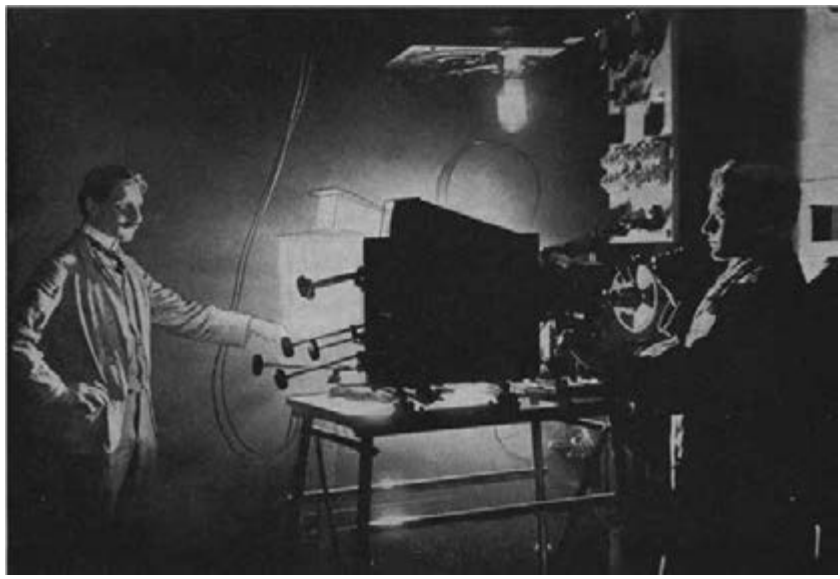

Fig. 2.2: A Copenhagen booth in a major picture theater late 1912. Published in *Filmen* (15 December 1912, p. 70).

Feature Screening on the American Market

In most American theaters in 1912, projection was still mainly predicated on the variety model with breaks not only between one-reel titles, but also between acts in multi-reel titles, often with illustrated songs or vaudeville acts in between. Features soon prompted alternate projection, for example concerning the premiere run for *Traffic in Souls* in November 1913 at Joe Weber's Theater in New York City. Prior to *Traffic in Soul*, the Helen Gardner Company produced *Cleopatra* in five reels. A comment in *Moving Picture World* for this film evidences continuous projection when it opened in New York City in tune with the previously mentioned Kinemacolor show. It is clear, however, from the description that the tailpieces between acts remained in place for *Cleopatra*: "There is no wait between parts, immediately after the inscriptive announces the end of one part, another inscriptive is flashed upon the screen announcing the part following."[50]

Quo Vadis?, the Cines production imported by George Kleine to the US, initiated a screen practice modeled after the legitimate theater that Kleine held on to for his roadshows for several years. The nine reels were divided into three parts with three reels each and between the parts there was an intermission lasting circa ten minutes.[51] (Same practice for Kleine's

roadshow featuring *Spartacus* in eight reels in 1914.) In a letter to Benjamin Hampton written in 1927, Kleine writes: "I standardized these roadshows, which consisted in each case of two projecting machines […]."[52] Louis Reeves Harrison comments upon this practice, but for a Vitagraph title in eight reels, *The Christian*: "Intermissions, such as occur between the acts of a stage play, operate as a source of relief without breaking the continuity of interest."[53] The same exhibition model was for *Cabiria* with two six-minutes intermissions.

Samuel Rothapfel broke with this model when presenting Selig's *The Spoilers* in nine reels without a break within a mammoth program at the Strand.

> It was a happy idea of the management to put the picture on without any break whatever. 'The Spoilers' as a novel is one of those books that we like to read to the end if possible, and where we cannot indulge our impulse we always lay the volume down with regret. Breaks and pauses in a running visualization of the novel would be even less welcome than interruptions in the reading. That the audience was well pleased with this new wrinkle was plain. It absorbed the story without an effort and its interest never lagged – at 11:30 we were more interested in the fate of Glenister and all the rest than at 9:15, though we had been looking intently at the screen for more than two hours.[54]

Six months later, Rothapfel claimed: "The old-fashioned intermission is, of course, out of the question entirely."[55]

This was true for many first class theaters, but the practice was otherwise far from standardized in the fall of 1914. According to *Moving Picture World*'s capsule overview:

> In many of our first-class theatres features consisting of more than one reel are now put on without any intermission whatever. The consoling assurances at the end of each thousand feet that 'the next part will follow immediately' are cut out and instead of a promise there is the immediate performance. It is of course ever so much better to present a great feature as a whole rather than in pieces. This applies we think to all features under six thousand feet. Where the feature exceeds this length a pause like the interval between two long acts is appropriate, but we ought to get away from the ancient phraseology such as: 'One Minute While We Change the Reel.' The old clumsy and undignified way of presenting a multiple reel still obtains, we are sorry to say, in even some of our best theatres in this city and

> always takes away from the real merit of the performance. Let us get away from measuring films of quality as if the strips of celluloid which record so much art and effort were simply merchandise like cloth or ribbons.[56]

As we have demonstrated, non-standardization was obviously the standard with regard to the presentation of features in the US as continuous performances run parallel to the pauses-and-acts model from the legitimate theater, while smaller, second- and third-run houses only slowly shifted over to two projectors. The illusion, and thus the immersion in spectatorship, was ripped asunder by breaks for reel changes and even further dampened by daylight screening in the feature era. Arguably, we need to rethink and qualify theories of spectatorship by factoring in the variations in exhibition practices, and the annoyance with breaks and their impact on metapsychology in the not always dark theaters.

An Interlude: The Strange Case of Massachusetts

The discourse concerning breaks and pauses sometimes came with a medical underpinning. In 1908, the state assembly in Massachusetts limited exhibitors to 20 minutes projection not to strain patrons' eyesight. "At the expiration of said period of twenty minutes, [exhibitors must] furnish some other form of amusement or entertainment for a period of not less than five minutes." This led to drawn-out conflicts with vaudeville house when small nickelhouses filled the gap between reels with live entertainment and debates concerning what their licensees allowed for or not. After an unsuccessful campaign for repeal in 1913, a trade source opines: "This law practically kills the multiple reel for the State, and, of course, the possibility of feature pictures is greatly lessened by the enforced five minute wait, between reels."[57] The 1914 State Assembly session, finally, sided with the exhibitors. According to a local exchange manager:

> [I]t is now possible to show a multiple-reel subject without destroying any unusual interest it may contain. Then, again, where before exhibitors had to do something for their patrons in the way of entertaining them during these five minutes' lull, they may now simply show pictures continuously. The repeal of the intermission law killed the song and vaudeville stuff.[58]

This debate was not a mere Massachusetts fad, proposals along this line from the Superintendent of Schools was for example on the table in Chicago,

but was never formally considered by the City Council.[59] In the absence of preserved records, all we know is the diffculties mentioned by Massaschusetts exhibitors in regard to the screening of features. If the law was actively policed is unclear. We leave this as a topic for further research, which takes us to some concluding remarks concerning important projection issues not addressed above.

Loose Ends

The critical role of projectionists' labor for the film experience has been conspicuously absent from my discussion. Timothy Barnard has brilliantly analyzed projectionists' appalling labor conditions in several countries as evidenced in the trade discourse and also argued for how this, the last leg in the production chain, was of paramount importance for releasing the full potential of the work invested in the previous steps in the production process.[60] Barnard's pioneering essay pointedly questions the blocking out of the exhibition practices in the theoretical discourse regarding spectatorship and theories of film narration, especially the fine-tuning and managing of projection speed from the booth. Obviously, the experiences in the auditorium to a large extent depended on projectionists' dexterity. Such key experiential factors deserve a study of its own along the lines opened up by Barnard's essay.

Barnard's observations of projection speed tie in with Terry Ramsaye's historical observation concerning the standardization of reel length. "The reel of about one thousand feet in length, was determined by the requirements of the vaudeville bill," writes Terry Ramsaye about the materials handed in the booth. "The pictures had to occupy about the average time of a turn, approximately twelve to fourteen minutes. The capacity of the projectors was built to meet the time requirement."[61] Be that as it may, but the format for film reels for long remained at circa 1,000 feet even after larger magazines and projectors with capacity to match them were available on the market. Vaudeville was a high-paced entertainment form quickly moving from one turn to the next, perhaps matching the American nervousness and restlessness posited as an aspect of modernity by George M. Beard already in the 1880s and analyzed by Tom Lutz as indicative of the mental landscape of 1903, a year when short story films began to surface.[62]

The discursive fragments fidgeted with in this essay, and mainly picked up from MPW, suggest that the years around 1913 was a period when American film exhibition changed to a more general two-projector model in the US to the benefit of restless Americans in the big and small houses. This

model was eminently suited to uninterrupted feature screening for audiences used to a brisk tempo between vaudeville turns, hence the discourse on waits and delays and the elimination of intermissions in metropolitan first-run houses already around 1910. In Sweden, in the absence of vaudeville culture, audiences were not primed for uptempo entertainment. And along the lines discussed by Barnard, the working conditions were presumably quite different depending on the amount of projectors to handle, which in turned prompted union interventions in many countries concerning safety measures and minimum staffing.

On a different note: was the serial film, emerging en masse in 1914, in part a response to the gradual prominence of features in first-run theaters? The serial format offered smaller theaters with only one projector an opportunity to present an alternative attraction in full by using magazines holding two reels. Ben Singer mentions that serials were rarely screened in large, first-run theaters but rather at small neighbourhood venues.[63] Was this, partly perhaps, a program component that allowed also smaller theaters with only one projector to whisk out annoying breaks? Again, more reserarch is called for. We pause for now.

Notes

1. Given the emphasis on the 1910s, I mainly analyze American trade discourse from that period. I am, for example, not taking into account the rich discourse in the trade magazine *The American Projectionist*, which began publication in 1923, at a time when the American practice, in the sense I am discussing, had long been established. When moving over to Europe and Sweden the materials from the 1920s is very relevant given the then ongoing exhibition shifts.
2. Hansen, *Babel and Babylon*; Hansen, 'The Mass Production of the Senses'.
3. Bordwell, Staiger, and Thompson, *The Classical Hollywood Cinema.*
4. For an excellent account of the threshold experience, see Ben Brewster's essay, 'A Scene at the Movies'.
5. Kathryn H. Fuller's research is key for the upsurge in studies devoted to small-town film exhibition, especially her *At the Picture Show.*
6. Klimes, 'The Narrative Viewed through the Projector'.
7. Bordwell, Staiger, and Thompson, *The Classical Hollywood Cinema*; Keil, *Early American Cinema in Transition*; Keil and Stamp, *American Cinema's Transitional Era*; For perspective on the breakthrough for feature films, see Frykholm, *Framing the Feature Film*.
8. Waller, *Main Street Amusements*; Abel, *Americanizing the Movies and 'Movie-Mad' Audiences, 1910-1914*; Moore, *Now Playing: Early Moviegoing and the Regulation of Fun*; Olsson, *Los Angeles Before Hollywood.*

9. Musser, *The Emergence of Cinema*; Musser and Nelson, *High-Class Moving Pictures*.
10. Münsterberg, *The Film: A Psychological Study*, 75. For my discussion of daylight screening in the US, see Olsson, *Los Angeles Before Hollywood*.
11. Before it was formally adopted the proposal was printed in Collier, '"Movies" and the Law', 13.
12. Hulfish, *Cyclopedia of Motion-Picture Work*, 190.
13. Richardson, 'Projection Department', 984-985. Images on p. 985. Clune's competitor Arthur Hyman runs his theaters in a similar fashion; see reportage with illustration from the booth at the College Theater – White, 'Los Angeles, City of Theaters', 86.
14. Kunzmann, 'Ohio Notes', 848. The Comedy in New York City operated in similar fashion in 1910, "two projecting machines being used, thus doing away with waits and delays." Anon., 'Novel Advertising Display of Yankee Film', 694.
15. Richardson, *Motion Picture Handbook*.
16. Richardson, 'Plain Talk to Theatre Managers and Operators', 8.
17. Anon., 'Lyric Theater, St. Louis Mo.', 202.
18. Richardson, 'Operators' Column', 410-11.
19. Anon., 'Temptations of a Great City', 1367; previously quoted by Bowser, *The Transformation of Cinema, 1907-1915*, 199.
20. Anon., 'The Durbar in Kinemacolor', 774.
21. Anon., 'Facts and Comments', 805.
22. The Film Man, 'Comment and Suggestion', 28. Previously quoted by Brewster.
23. Richardson, 'Projection Department', 778.
24. Sargent, 'Advertising for Exhibitors', 1079.
25. Richardson, 'Projection Department', 810.
26. Anon., 'Facts and Comments', 1087.
27. Anon., 'Exhibitors News', 1557.
28. Sargent, 'Advertising for Exhibitors', 178. Several smaller theaters advertised their two machines and no annoying delays as distinguishing aspect of their shows in 1914. For example, The New Model Theater (West 69th Street in Chicago), Grogg's (Bakersfield), and Crystal (Portland, Indiana) – *Suburban Economist* [Chicago], 13 February 1914, 3; *The Morning Echo: Bakersfield, California*, 16 October 1914, 7; *Commercial-Review* [Portland, Indiana], 16 November 1914, 1.
29. *Milford Cabinet and Wilton Journal*, June 17, 1920, 1.
30. Carlsson, *Hela Stockholm*, 267.
31. D. Waldner and A. Waldner, 'Palladium, en tekniskt representativ biografteater', 80.
32. Sjöberg, 'Biografer och biografägare i Amerika', 354.
33. Anon., 'Långa eller korta pauser', 717-718.
34. Maudlin, 'En kväll på bio som blev en besvikelse', 9.

35. Typed account attributed to Filmnytt, June 1925 in Olle Waltå's Collection, Swedish Film Institute.
36. Anon., 'Sture har blivit en modern bio', 5.
37. Stenberg, 'Hur skall man en biograf inredas?', 417.
38. Anon., 'Våra biografer', 8-10.
39. Anon., 'Dubbelmaskiner', 39.
40. Pettersson, '55 år som biografmaskinist', 46.
41. See Pathé's 1909 catalogue *Cinématographe: Appareils & Accessoires*, available at the business collection at the Swedish Film Institute.
42. Olsson, 'Nils Krok's Social Pathos and Paul Garbagni's Style'.
43. Magnusson, *Huru ett biografmanuskript bör utföras*.
44. Münsterberg, *The Film: A Psychological Study*, 86-87.
45. Harrison, 'Production Without Method', 489.
46. Bush, 'The Film in France', 179.
47. Richardson, 'Projection Department', 278.
48. Anon., 'Spolen gaar – Et Besøg bag Biografteaters Kulisser'.
49. Richardson, 'Projection Department', 1237.
50. Anon., 'Picture and Stage Realism', 477.
51. Anon., ' "Quo Vadis" on View Today'.
52. In George Kleine Papers, Box #25, Subject File: Hampton, Benjamin, Library of Congress. I am indebted to Joel Frykholm for putting this in my hands.
53. Louis Reeves Harrison, 'The Christian', 1656.
54. Bush, 'Opening of the Strand', 502.
55. Bush, 'The Art of Exhibition', 323.
56. Anon., 'Facts and Comments', 931.
57. Anon., 'Correspondence', 1036.
58. Anon., 'Bost Ball a Bif Affair', 1657.
59. Anon., 'See Danger in Movies', 8.
60. Barnard, 'The "Machine Operator"', 40-75.
61. Ramsaye, 'The Motion Picture', 8.
62. Beard, *American Nervousness*; Lutz, *American Nervousness, 1903*.
63. Singer, *Melodrama and Modernity*, 203.

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About the author

Jan Olsson is a professor in Cinema Studies at Stockholm University. He is the recipient of multiple research grants and has been a Visiting Professor at multiple universities; mainly in the U.S. Current research interests include early cinema, television studies, celebrity studies, archival practices, and the global reach of American media. Apart from a handful of edited collections, for example *Allegories of Communication*: *Intermedial Concerns from Cinema to the Digital* (with John Fullerton, 2004), *Television After TV: Essays on a Medium in Transition* (with Lynn Spigel, 2004), *Media, Popular Culture, and the American Century* (with Kingsley Bolton, 2010), Olsson has published five single-authored monographs, the latest *Los Angeles Before Hollywood: Journalism and American Film Culture, 1905-1915* (2008) and *Hitchcock à la Carte* (2015).

3. Reel Changes: Post-mortem Cinephilia or the Resistance of Melancholia

André Habib

Hidalgo, Santiago (ed.), *Technology and Film Scholarship. Experience, Study, Theory*. Amsterdam: Amsterdam University Press, 2018

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Abstract
This chapter follows Christian Keathley (2006) and other film scholars' recent reappraisals of personal anecdotes and subjective impressions as heuristic tools for studying hidden dimensions of cinema history. It attempts, by analyzing the disappearance of "cue marks" from the film theater experience, to seize an aspect in the private phenomenology of movie reception in the transition from analog to digital, that metonymically – and performatively – offers an "insider" perspective on technological changes. This anecdote (about the disappearance of "cue marks" between two viewings of Malick's *The Tree of Life*) will also be considered as an allegory of recent discourses on cinephilia, and the melancholy very often associated with it, in this transitional age. This melancholy can be seen as a mode of resistance to the sweeping amnesia technological "revolutions" often entail.

Keywords: Terrence Malick, cue marks, cinema experience, phenomenology, anecdotal history, cinephilia

Cinephilia and the Anecdote

In his 2006 *Cinephilia and History*, Christian Keathley develops the idea that cinephilic anecdotes, although attached to the most personal, fleeting, and often non-intelligible dimension of film viewing, can offer useful knowledge, not only on the level of film reception, but, more largely, on film history and film theory.[1] These anecdotes, for Keathley, are often tied to personal epiphanies, anchored to a context (a place, a time, people with whom the film was seen), and characterized by the fascination for specific, often unspectacular,

moments in the course of the film – a *punctum* as Barthes would say in *Camera Lucida*, or a *photogenic moment* as Epstein tried to theorize – that affect us without always knowing exactly why. Keathley develops his core argument concerning the 'cinephiliac moment' from a discussion between Noël King and Paul Willemen, published in *Looks & Frictions*.[2] In it, King and Willemen discuss the specific dimension of the cinephile's experience, which singles out fragments, extremely brief and often insignificant instances in a film (most often American classical narrative films) – a gesture by an actor, the color of his socks, a ray of light, an object in the periphery of the frame, a certain bodily posture – that operate for individual viewer within the general economy of the film, a revelatory epiphany that troubles the course of the narrative and imprints an intense, irrational, and enduring relationship between the spectator and the screen (this 'moment' could be the equivalent of what Barthes defines as the photographic *punctum*, "what I add to the photograph and *what is nonetheless already there*").[3] Keathley, moving from Willemen's and King's intuition, tries to develop this proposition, both historically and theoretically, by collecting and theorizing series of such anecdotes, through film criticism (French and American) and history, and articulating them through recent phenomenological approaches to film viewing (Sobchack), as well as cultural and media history (Kracauer, Benjamin, Schivelbusch, Doane, Marks, etc.). Keathley's claim is that once detailed, amplified, and properly excavated, these anecdotes shed a new and unexpected light on films, while rehabilitating, within film academia, the pleasure of cinephilia (often depreciated, criticized, and scrutinized in traditional film theory). He writes: "the cinephilia anecdote [is] a form designed to produce unexpected and useful knowledge about the movies, the starting point being what our proprietary discipline might regard as an excessive or inappropriately zealous cinephiliac pleasure."[4] A decisive, obstinate anecdote that impresses and lingers, that one carries throughout his life in his memory, is never, *in fact*, anecdotal: it says something of the person watching (his own obsessions), but also of the (historical, technological, phenomenological) conditions of watching in general; it can also produce new ways of writing film history and thinking about film theory while sticking to the most subjective and, for all appearances, banal dimension of the cinema experience.

Projecting *The Tree of Life*

Here, then, is the anecdote. In the summer of 2011 (my guess is mid-July), I had the pleasure of seeing a 35mm print of Terrence Malick's *The Tree*

of Life, at the Cinema Ex-Centris in Montreal. Of the many extravagant wonders the film contains, I was struck and completely obsessed during this first (of what was to become many) viewing of the film by something that was to become a true cinephilic – and unrepeatable, unretrievable – moment for me, something that barely had to do with the film's aesthetic, its plot, its character development, something that hadn't even been shot by Malick's cameraman, and that, technically, is not even really part of the film! It nonetheless completely shifted my understanding and appreciation of the film. I am talking about the cue marks, printed on the end of each reel of the print running through the projector, which serve to indicate the moment of changeover between two projectors and two reels. They come, as many movie-goers know, in many shapes and forms (X's, circles, ovals, written in pen or punched in, white or black, etc.). In the case of *The Tree of Life*, they were black circles, slightly oval (probably due to the 1.85:1 ratio), circled by what seemed like a thin pale yellow line. The *imprint*, the impression the cue marks would leave on me, did not appear immediately. In this case, as in many other cases of cinephilic moments, it often takes a second occurrence of the same thing (or a variation of the same) to make the previous one appear in its analogous singularity (as Deleuze formula goes: '*la différence apparaît entre deux sortes de repetition*' and '*la répétition est entre deux différences*'). *The Tree of Life* was made up of eight rolls of 35mm film, 139 minutes in all (although concurrently, many Digital Cinema Package files were also in circulation in North America and Europe[5]). Although the traditional changeover system had, generally speaking, been replaced in commercial theaters by a platter system (or so-called cake stand') where all the reels are spliced together on one big reel (as was the case in the ExCentris booth), contemporary prints (the rare ones still being produced) still contained these marks (for the rare cinemas or *cinémathèques* still running with two projectors). Whether the cue mark is printed on the negative or the positive, it would appear in white (positive) or black (circled in ink, as was the case for my *Tree of Life* print). It is only after the second changeover (from reel 2 to 3) that I recalled the preceeding changeover (from reel 1 to 2), which lay dormant in my memory, waiting to be released, and that was to enlighten retrospectively a vague intuition, still unarticulated, concerning the construction of the film and the emotional and physical pleasure I was experiencing at that moment.

The second reel, as any reader who has seen the film on print in a dark hall may recall, starts with a black image, out of which, through a series of magnificent shots, the creation of the world is deployed, from the big bang to the ice age. Then, at the end of this second reel, through a succession of

disjointed elliptical shots that are the trademark of Malick's films since *Days of Heaven* (1978), we witness in less than two minutes of screen time the conception and birth of Jack O'Brien, future hero of the film. If we are to take this material fact seriously (the unity of the reel), we could say the creation of the world leads to, pursuing the same breath of time, the birth of the character. The third reel is devoted to the formative years of the child until his early adolescence, a paradise soon lost (as is often the underlying tale of Malick's films), before the apparition of conflicts with the father, played by Brad Pitt, that start in the fourth reel. This fourth reel begins with a low, dark shot of Mr. O'Brien, his back filling the entire space of the frame, literally swallowing all the wonderful pastoral light in the park of the previous tracking shot that ends reel 3. Basically, Malick gives the same block of time to the creation of the world and the formative years of the child, and this can be calculated – and this is what led me to this conclusion – from the strict point of view of the materiality of the projection: one reel for each. This thematic (theological or anthropo-cosmogonic) equivalence, this narrative autonomy between the two 'creations of the world', of each version of the *tree of life* (the cosmic and the subjective-human), is inscribed in the rhythm and transition of the reel change; at least, it became clear and obvious to me because I became obsessed with those cue marks and what, through them, was slowly becoming a secret mode of access to the unfolding film.

This private and, in fact, hard to share experience coincides precisely with Willemen's definition of the 'cinephiliac moment', when he writes:

> What you are reconsuming is the moment of revelation experienced in an encounter between you and cinema, which may be different from the person sitting next to you, in which case you have to dig him or her in the ribs with your elbow to alert them to the fact that you've had a cinephiliac moment.[6]

Counting reels and a hard to define fascination with the specific tempo of the changeover (with its two-time drill: the first cue mark announcing the moment, six or seven seconds later the second one appears, even more briefly, swallowed by the light of the other projector), are part of the obsessive, vaguely fetishistic attachments associated with the intimate pleasure of viewing films on 35mm (a pleasure still easy to come by in commercial theaters in 2011, not so frequent today). It is also a way of knowing for sure – since digital projectors have improved considerably over time – whether we are seeing a print or a digital file. But rarely had a cue mark exerted such a decisive role in my critical appreciation of a film.

The more I pondered and reflected on the relation between reel changes and the narrative structure of the film, the more it became clear to me that this was very conscious on Malick's part (and in his other films, through the vague recollection of viewing some of them in theaters, which seemed to work around the same division into reels[7]), and, in this respect, that he was a director (his notoriously puzzling narrative structures notwithstanding), who, like many classical filmmakers, *still* thinks about his film 'in reels' (Hitchcock, Lang, Minnelli, Ford). What is true of the three first reels (and, in particular, the sense of unity found in the aforementioned reels 2 and 3), also holds for the first and last reel (again, this is a classic narrative strategy, where the first and last reels tend to mirror each other). All the 'points of present' (to speak in Deleuzian terms, '*pointes de présents*') are found in both the first and the last reel: in the first reel, all these 'points' are separated, placed on distinct temporal planes, whereas, in the last reel, they are reunited on the same plane of immanence (the seashore), concretizing the reconciliatory possibilities of the film that allow for the suturing of time and perform (without showing it) the end of mourning (it is the trajectory of the film). Here, too, there can be found a similar system of equivalence that can be intuited through the material structure of the projection.

By virtue of the simple fact of a film built and conceptualized by blocks of time/reels, which a theater in Bologna, the Cinema Lumière (and what a marvelous place to see *The Tree of Life*) showed with the two first reels inversed, for over a week, without any protests from spectators (the film has no opening credits, and thus the screening would start with the 'creation of the world' reel (Reel 2), which, in fact, could make sense, continuing into Reel 1 and into 3, without much narrative disruption). It is only when an audience member who had seen the film in another theater realized the problem that the inversion was corrected. This anecdote led to a variety of comments on the blogosphere where detractors of the film saw this as a confirmation of the confused, arbitrary and random construction of Malick's film.

Even if the film *worked* with the reels inverted, it surely would have appalled its maker, since we know Malick's attention to the conditions of projections of his films is notorious (and is similar to that of Kubrick and Lynch, known for their extravagant requests throughout the process of the film, from pre-production to projection). Confirming this, we can quote the 'Notice to projectionists regarding the *Tree of Life*' that Malick sent to theaters showing the film:

> Though proper theater projection is fast becoming a forgotten art, we consider projectionists to be the last remaining artisans of movie

exhibition and we implore your help in delivering *THE TREE OF LIFE* properly to the screen.

With a friendly salute, we urge you to consider the following points:

– The film should be projected at the 1:85 aspect ratio.
– (for film projection) Reel 2 begins with a black frame. Please be sure to cut at the marked frame or the frame line.
– Please keep the faders at a minimum of 7.5, though we hope to set as high as 7.7 if the sound system permits.
– There are no credits at the beginning of this film, so make sure the lights down cue is well before the opening frame of reel 1.

These specifications refer to a certain type of film experience, but also to a type of control and monitoring that, as Malick himself projects in his notice, is rapidly disappearing. Film projection has almost vanished from commercial cinemas and most of the operations he refers to are now automated and beyond the control of the person responsible for 'playing' the film (a role that we need to distinguish from that of 'projectionist').

On the same blog page where I collected this information (Aphelis[8]), we can find similar notifications by Kubrick and Lynch, as well as Selznick. Kubrick had very specific requests for *Barry Lyndon* concerning the music that was to be played before and after the screening, as well as during the intermission (among other things); for *Mulholland Drive*, Lynch asked projectionists to "raise volume 3db hotter than normal," and "give the picture a small amount of headroom" (slightly modifying the 1:85 aspect ratio, something that is impossible to control in most current digital cinemas). And to go as far back as *Gone With the Wind*, David Selznick (the producer, not the director) signed a four-page booklet with specifications for exhibitors. While, today, filmmakers and producers are perhaps just as exacting about the conditions of exhibition of their films, the flexibility allowed by digital projection and the autonomy of the 'intendent' is very low (choice of aspect ratio, sound volume, luminosity). From *Gone with the Wind* to *The Tree of Life* to current exhibition practices, it is possible to appreciate the gradual dissolution of an 'artisanship' of movie exhibition that existed from the birth of cinema until its fairly recent disappearance (we can still witness it during conscientious avant-garde or early film screenings).

These documents are an archive of the way film technology and aesthetic experience were historically controlled and modulated to shape, in different epochs, specific types of desired film reception and overall meaning, beyond the film's so-called *text* (the 'text' of *Barry Lyndon* does not require that there be "no less than 15 foot lamberts of lights on the screen, and

no more than 18," and yet the experience of the film desired by its maker requires it). All this is deeply tied to the physical reality of film experience that was still anchored to the same mechanical reality of the apparatus, at least from the classical sound age, but well beyond if we are to only consider the 35mm format, as well as the reel of celluloid as measure of unit of certain types of film experience (one-reel, multiple-reel, etc.). All this is, generally speaking, well forgotten, and only specialized events devoted to early cinema, film restorations, experimental cinema, and a handful of *cinémathèques* and arthouse cinemas, still understand the weight and importance of such 'superficial' preoccupations.[9]

If the *Tree of Life* is, among other things, a philosophical and technological mediation on the capacity of cinema to allow the co-existence of extremely foreign temporalities (the Big Bang, the life and death of dinosaurs, life in Waco, Texas in the 1950s, life in a contemporary urban city in the 2000's), to intertwine and collide generations, the old and the new (the film was also shot on various formats of celluloid film stock [35mm, 65mm], and used many different digital cameras [Phantom HD Gold, Red One Camera] and digital related technologies), it is interesting to consider that it also appeared in North American theaters at a historical juncture between two ages of cinema that could still, in 2011, cohabit in the same city, in commercial venues (we can still see films on film in Montreal, but almost exclusively, like elsewhere, at the *Cinémathèque*). During the summer and fall of 2011, the quasi-totality of cinemas in Montreal, as well as in North America and Europe, replaced their 35mm projectors with digital 2k projectors, in accordance with the Digital Cinema Initiative (DCI, regrouping the major Hollywood studios) recommendations (since then, a new norm of 4k has been adopted by some commercial theaters, and there is talk of 8k projection, but, of course, this would mean changing the equipment of all the theaters, especially repertoire cinemas that are far from reimbursing their 2k projectors, but all this is another issue). The November 2011 issue of *Cahiers du cinéma* (#672) announced on its cover page: "*Adieu 35. La révolution numérique est terminée* " ("Goodbye 35. The digital revolution is finished").

The second time I saw *The Tree of Life* during that summer of 2011, was in Toronto, at the TIFF Lightbox, where the film was shown in 2k/DCP format (I have, since then, screened it numerous times on my Blu-ray player). Of course, at all of these ulterior viewings, I was unable to find *my* cue marks (which I had mentally reconstructed and placed in order). For, in the meantime, growing in my memory, blossoming in my recoding of the experience, these cue marks had become *mine*.

Reel Changes

The reader would be right in thinking that this anecdote about cue marks is totally insignificant, when compared to the extent and variety of mutations experienced by the film viewer since the 1990s (one can see *The Tree of Life* on his iPhone in the subway or on a plane! Who cares about cue marks, some might think!). But my revelation of the importance and further disappearance of the cue marks in this film – that, to me, resonate with Pier Paolo Pasolini's 1975 article on the 'Disappearance of the fireflies' and the recent discussion Georges Didi-Huberman addresses concerning this marvelous text in his *Survivances des lucioles* (2012) – is, to me, exemplary of the kind of small detail that transforms the very nature, both in depth and surface, of film experience. The cue mark is tied to a memory of cinema that arches back to its process of institutionalization, a memory that is recaptured and survives every time a film is properly projected on celluloid, in a darkened hall.[10] The evolution from early cinema's 'one-reeler' (1000 ft, roughly 11-15 min.) to the appearance of multiple-reel films (but where each reel maintained a sense of unity and self-containment)[11] in the 1910s to the classic continuous 'five-reeler' (5 x 2000 feet, around 90 min.), established in the 1910s and 1920s and that still dominates narrative cinema today, allows one to rapidly scan the history of cinema and the development of narrative feature length film. It also inscribes this stabilization and standardization within a larger cultural scope: the introduction of the 'invisible' reel change, from probably the mid-1920s onwards, marks the beginning of the standard experience of a narrative feature film, with its five reels, its five pivotal moments, which are not without recalling the five acts of classic tragedy or the five movements of a classic symphony, etc.[12] Among other things, the shift to digital projection erases this physical memory of the history of cinema (that the French language still preserves in the expression '*long métrage*'), inscribed into the archeology of its technical apparatus and configuring the experience of the viewer (albeit a specific kind of viewer, such as myself, who is accustomed and attached to these cue marks and the information they provide: length of the film, narrative development, which often entail quality, provenance, and date of the print, etc.). Interestingly, it was often still possible to see cue marks on VHS copies as well as low budget DVD transfers (which were usually simple transfers from theatrical release prints). They have (almost) completely disappeared from common DVD and Blu-ray editions today, for which the source is digital intermediaries.

It is often possible to identify – without any historical research, simply from movie-going habit in *cinémathèques* and arthouse cinemas – a date,

often the provenance of the print, from the shape of the cue mark, i.e. whether the cue mark was punched in the negative or the positive print, in the same way that it is possible to estimate the age, the viewing frequency of a film, and the care it has undergone from the scratches and tears at the end of reels (where the cue marks usually appear). There is a private pleasure tied to these cue marks, a pleasure partly due to the fact that they are not meant to be seen by the viewer, in that, although they are *on* the film, they are addressed to the projectionist alone (as so often, the cinephile develops a fascination for something he believes he alone has seen).[13] The cue mark is part of the secrets of film history and technology, demythologized or, better, remythologized by the popular *Fight Club* (Tyler [Brad Pitt, again!] says "in the industry, we call them 'cigarette burns'," a term never, in fact, used in the industry, but which, since then, has been widely used by movie buffs, although projectionists have never adopted the term and are, in fact, quite dismissive of its usage). *Fight Club* appeared on screens in 1999, in the wake of the digital revolution, when, all of a sudden, these forms of movie exhibition where beginning to feel increasingly obsolete; at least, this was the case by that point of the changeover system, replaced by the platter system. Not so paradoxically maybe, *Fight Club* was, probably along with the *Matrix*, one of the films that had, at the time, the most exceptional and extravagant 2-DVD box set, and that totally embraced the possibilities of home-movie viewing.

Films as diverse as John Carpenter's 2005 TV-episode *Cigarette Burns* (in the *Masters of Horrors* series, reclaiming the expression popularized by *Fight Club*), or Tarentino and Rodriguez's *Grindhouse* double-bill, are two recent examples of anachronistic usage of cue marks, at a time when technology was rapidly turning these fleeting apparitions into *private jokes* for *geek connoisseurs*, commodified within their narrative or worked into the visual texture of the work, both pointing, in truth, to a lost experience for most of the viewers (*Cigarette burns* aired on television and is available through Vimeo, *Grindhouse* had a very brief existence in theaters, the audience of this film preferring the DVD or Torrent experience).[14] Also, in all the above-mentioned cases, the cue marks in the film do not, in fact, correspond to *real* cue marks; they are there as commodity (often generated digitally). I would say, in the same way digital photography cannot produce a light leak, or a super8 app on an iPhone cannot really scratch the image, these are all simulacra that point to a lost, technologically absent origin that capitalizes on the aesthetic virtues of an analog effect, but without the logical causality, historical intelligence, and knowledge transmission that produces it. What interests me, here, is less the geek culture's fetishistic,

almost regressive fascination with cue marks that one often encounters in certain circles and concerning certain films,[15] but the memory they carry and the way they (unknowingly) allowed an articulation of a spectator's contemporary gaze with a crucial, albeit discreet, dimension of the history of cinema's apparatus, which vanished suddenly, not even with a whimper, around 2011-2012.

These 'fireflies', as I like to call them, in their very fleetingness, in their periodic and obsessive return (in the films, in my memory of film viewings[16]), their apparition as brief streaks of light tearing at the image, not meant to be seen by anyone (except me), seem to be made of the same substance as the film from which this meditation stemmed from, *The Tree of Life*, where their importance was to grow paramount in my understanding of the work, but also in my understanding of what was shifting in movie experience at the time. Thus, it is with melancholy that I saw them disappear from commercial theaters (since then, I often try and imagine where they would have been placed in the films I see in theaters, and it has made *Cinemathèque* screenings of 16mm or 35mm prints even more precious). But maybe, in turn – and this point is perhaps the substance of the reflection I am trying to conduct here – it is precisely on the threshold of their erasure, of their technological obsolescence, that they appeared *significant*. In the same way the *vintage* inflation surrounding analog technologies or 'residual media' (LoMo photography, super8 apps on the iPhone, a plethora of digital programs allowing the simulation of the specificities of celluloid film or photography, vintage typewriters, etc.) is only possible because of the rapid changes that have been occurring in the wake of digital conversion.[17] To express it in less negative terms, we can say, like a character of Godard's *Éloge de l'amour, "C'est quand les choses finissent qu'elles prennent un sens*" ("It's when things end that they start making sense"). Or, in Pasolini's existentialist statement: "Death enacts an instantaneous montage of our lives. [...] only thanks to death does our life let us express ourselves."[18] The disappearance of the cue marks from the theater suddenly made clear what they meant to me, for certain cinephiles understanding of cinema's (technological) history.

The Cinephilia Discourse

This anecdote and the muttering they allowed me to develop on the shifting nature of film experience, can be seen in conjunction with, or as an allegory of discourses on cinephilia, and the place these discourses have come to

occupy (through the 2000s) within film theory and history. For example, precisely at a time when cinephilia has become decisively obsolescent in its traditional and canonical form (a process that has surely been underway since the 1970s[19]), to adopt new continents of cinema (there is a new map of world cinephilia today, as Rosenbaum and Martin aptly showed in *Movie Mutations*, 2004), but also an ever greater variety of medias, platforms, social interactions, and modes of expression (cinephilia is well served by today's blog culture and social media, as we can witness in two volumes edited by Jason Sperb and Scott Balcerak, *Cinephilia in the Age of Digital Reproduction,* 2009 & 2012).

Although it can be argued that film studies developed (in France and North America to talk only of those) on a backdrop of often distant cinephilia – either in its aesthetical approach or its appraisal of certain filmmakers/auteurs canonized by classical cinephilia (Parisian, to be blunt)[20] – cinephilia served more often than not as a 'bad object', a *repoussoir*,[21] acting as a foil, with Metz's famous recommendation (although frequently the quotation limits itself to the first part, keeping aside the ambiguity Metz wishes to maintain):

> To be a theoretician of the cinema, one should ideally no longer love the cinema and yet still love it [...] Not have forgotten what the cinephile one used to be was like, in all the details of his affective inflections, in the three dimensions of his living being, and yet no longer be invaded by him: not have lost sight of him, but be keeping an eye on him.[22]

In Metz's pronouncement, cinephilia is identified as a past life ("*le cinéphile que l'on a été*"[23]), before the theoretician put on the white lab coat of scientificity. It is a distancing or splitting from oneself (where the cinephile must be maintained only for 'self-analysis' and observational purposes). It can be said that 'cinephilia', as object of theoretical and historical investigation, on the one hand, as self-proclaimed critical position from which to speak from, on the other, has traditionally received limited academic attention until recently (even if, as can be argued, much of its curriculae, choice of films, and authors, stem from the conquests acquired by 'classical cinephilia' of the 1950s-1960s). There is no doubt that there has been, in recent years, a gradual shift in discourse. Cinema's centenary, on the one hand, and Susan Sontag's controversial *New York Times* article ('100 Years of Cinema' also titled the 'Decay of Cinema'), a heartfelt and critical meditation on the disappearance of a certain type of cinephilic love of movies, can be seen as two watershed moments that crystallized debates about cinephilia that

have been underway for 20 years. Already, Paul Willemen and Noël King's *memorialist* dialogue, published in 1994, set the tone of many of the debates that were to blossom and explode within academic discourse at the turn of the century, triggered by the publication of Keathley's *Cinephilia and History, or the Wind in the Trees* (this decisive book's major intuitions are found in King's and Willemen's article/discussion). Since then, a great number of articles, special issues, monographies, collective publications, colloquiums, workshops, and seminars, have multiplied, incorporating, and interrogating cinephilia in all of its dimensions and geographies, from its classic, urban, intellectual manifestation in New York or Paris in the 1950s and 1960s, to its earliest forms in the 1910s, as well as its contemporary variations in the digital scape, in both Western and Eastern culture. Deploying various conceptual and methodological tools, from cultural history to phenomenology, micro-history and sociology, absorbed by reception studies, gender studies, women studies, digital media studies, one can say that, compared with the tone of Keathley's introduction to his book, cinephilia has gained respectability in academia, although one can argue it has been at the cost of a domestication and a normalization within the constituted branches of the discipline (are film studies re-enchanted by this, as Keathley had hoped?).

By mapping a number of discourses on cinephilia, we can ponder on the meaning of its current currency. One thing that does seem certain, is that many of these discourses look at cinephilia through the lens of historical pastness, that they take for granted that it has passed, that it has died or has, more simply, always been disenchanted.[24] To caricature, we can say cinephilia survives today either as a zombie (the nostalgic living dead) or the cyborg cinephilia 2.0 (harnessed and expanding through to contemporary digital platforms). But in both cases, it is as if we needed cinephilia to vanish – historically, technologically – to constitute itself as an object of theory and study (death is always a moment of great reflexivity, as Godard's *Histoire(s) du cinéma* or Malick's *The Tree of Life* demonstrate). As Thomas Elsaesser once wrote (although he was not sure if the phrase was his or Lev Manovich's), "theory is always the funeral of a practice."[25]

As Mary Ann Doane summarizes at the end of her wonderful book, *The Emergence of Cinematic Time, "*[i]n the face of new technologies such as television and digital imaging that seem to threaten the cinema with obsolescence, film theorists have manifested a renewed interest in cinephilia and cinematic contingency."[26] Similarly, Laura Mulvey more recently argued:

> As the cinema underwent those transformations of the 1990s that brought so many pronouncements of its death, so cinephiles began to reflect

> (perfectly rationally) on the passing of the special, ritualistic conditions of watching films, obsessive habits of moviegoing and the love of moments and fragments that had characterized their preferred form of spectatorship.[27]

Technology not only modified cinephiliac practices, it produced and encouraged an alternative mode of writing about, theorizing, and historicizing the deep phenomenology of film experience, which, I believe, characterizes a lot of film studies writing of the last ten years. The tone and nature of many articles (especially those written by an older generation of (very diverse) scholars, such as the already cited Andrew, Willemen, Elsaesser, Rosenbaum, but also Wollen's wonderful *Alphabet of Cinema* (2001) or moments in David Bordwell's blog, *Observations on Film Art*), often reflective, adorned with melancholia, reminiscent, playfully anecdotal, joyously disenchanted, invoke a need to reinscribe and theorize individual experience and spectatorial phenomenology from a subjective standpoint. In so doing, they seem to always point to a fleeting, extinct experience, which makes it *available* as a theoretical material (even if it consists of saying cinephilia is still very much alive).

My hypothesis could be formulated simply thus: technological innovations of the last 20 years, and, in particular, the shift to digital cinema and the variety of new modes of access and viewing it allowed, profoundly transformed the face of cinephilia, making its traditional definition 'untimely'.[28] By the same discursive twist that illuminates interest in *dead* or *residual media*, cinephilia's waning has awarded it, in addition to a series of concepts in the same *situation*, and to which cinephilia became associated with, a powerful currency: notions such as indexicality, contingency, epiphany, chance, and, more generally, consideration for the materialities involved in the film experience (things 'media archaelogy' is interested in), all gained importance in the 2000s. Post-mortem theorizations of cinephilia should be considered through this discursive network formation, perfectly and brilliantly defined by Elsaesser when he writes:

> We care about the indexicality of the photograph because we miss it in the post-photographic pixel. We celebrate the 'materiality' of clunky 18th century stage machinery or the elaborate illusionism of a Pepper's Ghost phantasmagoria because of the effortless creation of such three-dimensional 'special effects' in computer graphics virtual space. We marvel at the sheer 'diversity' of 19th century visual culture – maybe

> because we sense its imminent disappearance? In which case, 'convergence' might be less our inescapable fate than the name of our inadmissible fear, nostalgically but also frantically driving our excavation and preservation efforts.[29]

It is in this wide context that one can also appreciate the renewed interest for the long-neglected (especially in French theoretical circles) life and writings of André Bazin. This is apparent in the recent (and sometimes critical) works of Dudley Andrew, Hervé Joubert-Laurencin, or Laurent Le Forestier,[30] in the surge of colloquiums (the two *Opening Bazin* conferences in Paris and Yale, and the proceedings that came out of them), and the relaunching of the project to publish the long-awaited complete works (*Cahiers du cinéma*). The title of an issue of *Film International*,[31] I believe, sets the table for the discussion: "Because we need him now: re-enchanting film studies through Bazin". As if a perceived necessary re-enchantment of our discipline presupposes a return and a rehabilitation of cinephilia and its tutelary patrons.[32]

The same, it seems, can be said of the presence of Jean Epstein (the original 'proto-cinephile', among the first generation of militant film *aficionados*). We could mention numerous anthologies, conferences, film retrospectives (in Montreal, Paris, New York), the (also, long-awaited) publication of his complete writings in French (slated for publication between 2014-2017, by Les Presses du réel), and a complete DVD box set (Potemkine film). As symptomatic as the title of the *Film International* issue for Bazin, is a website called photogenie.be, which allows us to understand Epstein's status within the discursive *zeitgeist* concerning cinephilia:

> [A] present-day interpretation of cinephilia can be guided by *photogénie* in order to reconnect to a tradition in which the fascination with moving images leads to fresh insights. At photogenie.be, we want to combine a sense of wonderment with keen analyses. The connecting principle is the intense perception of cinema. The articles that will be published on this website – on films old and new, cinema past and present – will not try and force this perception to fit preconceived frameworks, but will endeavour to make the viewer receptive to what films can make us see, in an attempt to put the allure of the cinema into words. […] Epstein and his contemporaries *are* making a come-back, both in academic film studies and in cinephile circles. But what is the relevance of their theories and what can we as present-day cinephiles learn from their aproach to our beloved medium?[33]

We could also, among other manifestations, mention the '*Cinephilia Dossier*' of the Journal *Framework* (published in the spring of 2009), where the same question was addressed to critics, bloggers, film scholars: "What is being fought for by today's cinephilia(s)?", trying to revive, or tap into the polemic fever and fervor of yesterday's cinephilia debates. In the introduction, Jonathan Buchbaum and Elena Gorfinkel explain how, "In asking our question regarding contemporary cinephilia, we wondered whether these writers and critics could or would identify a polemical thrust driving cinephiles and their critical practice today",[34] only to conclude:

> While we come from different generations of cinephilia, we were interested in whether contemporary critics/writers saw themselves as having a position to defend – political, aesthetic, or other/intellectual. In fact, it seems that fighting for communities and bridge building, not polemics as we understand it, is the dominant thread in the responses. That may very well reflect one of the most dramatic changes in film viewing over the last thirty years, which is the shriveling of the theatrical audience for films resulting from the worldwide phenomenon of new supports of video and DVD, and the new delivery systems of cable and satellite. The public sphere once occupied by *Cahiers,* and *Screen, Film Comment, Framework, Cineaste, Jump Cut*, all still publishing, and many others has migrated or melted into the Internet of online journals and blogs, and the responses indicate that they are trying to assimilate that transformation in their writing, which may for the *moment render battles of critical position quaint vestiges of a lost world.*[35]

In this respect, and for all the reasons I have evoked, we can legitimately ask if every theory and history of cinephilia is always an expression of melancholia (self-expressed or not), speaking always-already of an experience that is lost, absent. A book titled *Goodbye Cinema, Hello Cinephilia*[36] is another schizophrenic symptom of this paradoxical, melancholy discourse on cinephilia. Cinema is not what it was, we have forgotten what it was, but cinephilia – and this is Rosenbaum's hope – continues to exist (but what would cinephilia be without cinema, if not a melancholic practice)?

The underlying and unresolved questions would consist of asking if there is a link between this melancholic theory of cinephilia and cinephilia's melancholia (so beautifully expressed by Serge Daney or explored in Godard's *Histoire(s) du cinéma*[37]). This cinephilic melancholia did not wait for the advent of digital cinema and torrent culture, and can be diagnosed in critical writing between the late 1960s and late 1970s, precisely bracketed

by the expansion of television and the first VCRs, between May 1968 and the emergence of film studies as an independent discipline.

Can one melancholically theorize cinephilia's melancholia? Can one use such a melancholic approach to cinema (that should be distinguished from a strictly nostalgic, regressive attitude)? Can there be an epistemology of melancholia, in terms of a specific mode of knowledge it allows?

If there is such a thing, one of the features of this melancholia is its attachment and valorization of a certain type experience, often anachronistic, often extinct, 'vestige of a lost world', for the simple reason something of cinema's memory passes through it, that it is luminous and inspiring. This 'melancholy of resistance', or this 'resistance of melancholy', affords the advantage of (at least trying to) being critical of deterministic techno-theoretical discourses. It is also a way of carrying a portion of this memory of cinema, deposited in anecdotes, in privileged encounters with films and the singular epiphanies they allow, with the hope of being able to reanimate, in others, their fleeting and ephemeral shards of light.

Notes

1. Keathley, *Cinephilia and History*.
2. Willemen, 'Through the Glass Darkly'.
3. Barthes, *Camera Lucida*, 55.
4. Keathley, *Cinephilia and History*, 10.
5. Although it has been the subject of much discussion, it is useful to remind readers that for its premiere in Cannes, in 2011, Terrence Malick opted for the DCP rather than the 35mm print of *The Tree of Life* (after a six-hour debate and testing). As we can read in the July 2011 editorial of *CSI-La lettre*, the newsletter published by the French *Commission supérieure de l'image et du son*, "It is maybe not insignificant that Terrence Malick, director of *The Tree of Life*, winner of the Palme d'Or, finally chose the digital projection to present his film at the festival, after having been attached body and soul to the 35mm copy. This immense director hesitated during rehearsals between the celluloid and DCP copy of his film, asking Pierre-William Glenn and Alain Besse to screen over and over again the same scenes in the two formats to finally concede that the quality of the digital copy was exceptional and that it faithfully represented his intentions and his work" (Glenn & Hébert, 'Éditorial', 1, my translation). In 2014, every film shown in Cannes was projected in a digital format.
6. Willemen, 'Through the Glass Darkly', 237.
7. I recall in *The New World* a reel (probably reel 2) ending with one of the characters saying: "We're going to live like Kings here," followed by the third

reel beginning with a shot of an axe cutting down a tree; the 'cut', here, between the idealized 'new world' and the harnessing of nature that will destroy it, could not have been more clear. It is embedded not only in the editing of the film, but in the very split between reels that make up the film.

8. 'Actual copy of Terrence Malick's Notice to Projectionists (Tree of Life)', *Aphelis, An iconographic and text archive related to communication, technology and art*, http://aphelis.net/actual-copy-terrence-malicks-notice-projectionists-tree-life/, 22 June 2011.
9. On these important issues, see the discussions found in P. Cherchi Usai, D. Francis, A. Horwath, M. Loebenstein, *Film Curatorship : Archives, Museums, and the Digital Marketplace* (Vienna: Synema, 2008).
10. It is for this reason that curators such as Michael Loebenstein, consider the DVD of a film restored by a film museum to be a "catalogue medium," in which "you are going to see black leader in it, you are going to see reel changes. We include them to inform you about the special conditions the material was in when we found it." (Cherchi Usai et al., *Film Curatorship*, 27)
11. On this point, see Ben Brewster, *The Silent Cinema Reader* (New York: Routledge Press, 2004), 228-234.
12. On the other hand, it can be argued that films such as Nolan's *Memento* (shot on film) or even Kiarostami's *Ten* (shot on video) seemed to have been imagined to work within the narrative (and mental) structuring of the DVD, with its division into short (10 min. or so) 'chapters'.
13. Again, as Willemen argues: "What is being looked for is a moment or [...] a dimension of a moment which triggers for the viewer either the realization or the illusion of a realization that what is being seen is in excess of what is being shown. [...] It reveals an aspect or a dimension of a person, whether it's the actor or the director, which is not choreographed for you to see." (Willemen, 'Through the Glass Darkly', 237).
14. It can also be argued that a certain number of films shot on video, lost their *essence* when shown on 35mm in theaters, such as Sokourov's *The Russian Ark* or Figgis' *TimeCode* (the splitting of the films into reels, even mounted on platters, created a disruption in the *real timeflow* the films where based on). A digital projection was better fitted to these works.
15. To give only one example out of many, there exists a web site devoted to Star Wars culture, that collects (using a wide range of versions of the films, mostly bootleg copies from the late 1970s and 1980s, for the original theatrical release of the first trilogy, and theatrical bootlegs for *The Phantom Menace* and *The Attack of the Clones*) screencaps of the cue marks of the *Star Wars* episodes: see http://fd.noneinc.com/Reel_Changes/Reel_Changes.html.
16. I can recall an extenuating, late night screening at the *Cinémathèque* of a worn-out print of Michael Snow's *La région centrale* (1971), when the joyous apparition of the cue mark (accompanied by multiple scratches and sound glitches) signaled that the shot was (finally) soon going to end; I can recall a screening, in the 1990s, of *Persona*, at the Cinéma du parc, where the projectionists would systematically miss his changeover, and the first cue

mark left us suspended, each time, wondering if he'd 'get it' this time (all this somehow made sense with the film we were watching), etc.

17. See Acland, *Residual Media*.
18. Pasolini, 'Osservazione sul piano sequenza'.
19. For many historians of cinephilia such as Antoine de Baecque, May 1968 was the pivotal moment, when, to generalize, growing suspicion was drawn towards cinephilia, accused of ideological blindness, in favor of political and psychoanalytical theory that was to drag the cinephile out of the cavern and into the (dialectical materialist) light. When these and other Grand Theories collapsed (in the 1980s), home video, blockbuster culture, and the desertification of movie venues in cities big and small, had erased all possibilities of a 'true' cinephilia surviving (like the one Sontag and others experienced and nostalgically regret). See De Baecque, *La cinéphilie*, 365-377, and Andrew, 'The Three Ages of Film Studies', 341-351. See also Skorecki, 'Contre la nouvelle cinéphilie'. For my part, I rather share the opinion and attitude of Jonathan Rosenbaum and others who prefer to talk about cinephilia *mutations*, and adopting a posture that can maintain alive older practices of cinephilia, whilst embracing the possibilities of the new (anachronism is always an interesting status for a cinephile).
20. A point violently critiqued by Laurent Jullier and Jean-Marc Leveratto, who argue that, in France at least, a specific brand of elitist 'cinephilia' (*Cahiers*-oriented) not only literally occupied the film studies discourse and practice in France, but also confiscated a more popular, widespread understanding of cinephilia and movie-going. See Jullier & Leveratto, *Cinéphiles et cinéphilies*.
21. See Andrew, 'The Three Ages of Film Studies', 342-343.
22. Metz, *The Imaginary Signifier*, 15). See also Keathley's discussion of this ambivalence of film theory in *Cinephilia and History*, 27-28.
23. Although it is not the task of this article, Martin Lefebvre has shown convincingly how parallel to Metz-the-theoretician, there exists a Metz-cinephile, against which the theoretician is in constant struggle. In a fascinating interview given in 1975, Metz explains his complex, and slightly schizophrenic relationship (self-hatred, mockery, love) with cinephilia: "*Et puis, il y a cette résistance qui me retient sur le bord de l'objet film, comme si j'étais devant un seuil que j'hésite à franchir. Ça tient certainement au fait que je l'ai trop aimé à une certaine époque. Les coups de patte contre la cinéphilie dont je parsème scrupuleusement mes écrits sont la liquidation d'une vieille querelle avec moi-même. Quand j'y pense, se sont sans doute les seuls passages un peu agressifs et polémiques qu'il y ait dans mes livres. Aujourd'hui, la cinéphilie est une attitude que j'ai largement 'dépassée', qui me fait sourire, mais il faut croire que je ne l'ai pas entièrement dépassée puisque je constate, quand je suis franc, que je lui en veux* [...] *Je crois que c'est ce même problème qui explique ma résistance à l'analyse textuelle.*" (Metz, 'Entretien', 25)
24. Elsaesser, 'Cinephilia or the Uses of Disenchantment', 27-43.
25. Elsaesser, 'The New Film History as Media Archaelogy', 92, n.114.
26. Doane, *The Emergence of Cinematic Time*, 225.

27. Mulvey, 'Some reflections on the cinephilia question', 191.
28. One example of this is the 2002 documentary *Cinemania*, a portrait of 'traditional' New York cinephiles (deeply attached to the theater experience) that is completely at odds with the heroics and beautified image of 1950s and 1960s Parisian of North American cinephilia. In 2002, the same movie-going habit is perceived as autistic, antisocial and pathologically abnormal.
29. Elsaesser, 'The New Film History as Media Archaelogy', 92.
30. Andrew, *What Cinema Is!*; Joubert-Laurencin, *Le sommeil paradoxal* ; Le Forestier, 'La « transformation Bazin »'.
31. *Film International*, 5, no. 6 (December 2007).
32. The sheer idea of '*opening Metz*', through a thorough and thought-provoking investigation of his archive, as Martin Lefebvre (see Chateau & Lefebvre, 'Christian Metz et la phénoménologie') had recently engaged it to situate his work and thought not only as a theoretician, but also as a cinephile and lover of movies, proceeds, it seems, of the same discursive paradigm of a theoretical rehabilitation of cinephilia.
33. 'Reviving Photogénie', *Photogenie.be*, http://www.photogenie.be/photogenie_blog/topic/0-reviving-photog%C3%A9nie.
34. Buchbaum and Gorfinkel, 'Introduction', 176.
35. Ibid., 180, emphasis mine.
36. Rosenbaum, *Goodbye Cinephilia.*
37. Daney's melancholia (omnipresent in his later work, and particularly, from the time he became sick and knew he was shortly going to pass away) stems both from his understanding of (his) cinema as having to do with childhood and childhood impressions (*'Le cinéma, c'est l'enfance'*), hence something always-already lost and impossible to recapture; this melancholia appears in the context of a contemporary media world – and this is ever ceasingly true – that can increasingly do *without cinema* ('un monde sans le cinéma'). As he writes in his *L'exercice a été profitable, Monsieur*, "*La mélancolie cinéphilique viendrait de ce que nous avons rencontré certains films qui nous ont donné à voir ce que nous ne connaissions pas* (*ce dont nous n'avions pas l'usage*)*, le visage d'une expérience à venir, la bande annonce de ce qui nous regardera un jour.*" (Daney, *L'exercice a été profitable*, 323).

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About the author

André Habib is an associate professor of Film Studies at the Université de Montréal. He is the author of *La main gauche de Jean-Pierre Léaud* (2015) and *L'attrait de la ruine* (2011). He also coedited the following works: *Chris Marker et l'imprimerie du regard* (2008), *L'avenir de la mémoire: Patrimoine, restauration, réemploi cinématographiques* (2013), as well as *Épopée: textes, entretiens, documents* (2013). He is also since 2002 the co-director of the journal *Hors Champ*. His work has revolved these last few years on issues dealing with cinephilia, film technology, the archive, experimental cinema and in particular found footage filmmaking.

4. Walter Benjamin's Play Room: Where the Future So Eloquently Nests, or: What is Cinema Again?

Dana Cooley

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Abstract
Benjamin lamented the "forgotten futures" of film, those techniques and approaches which disappeared with the commercialization of cinema. More recently, some critics assert that digital technologies have distorted or outright destroyed cinema. These accusations, however, are largely predicated upon the notion that cinema 'proper' is the evolution from crude practices to the inevitable culmination of the medium as vehicle for narrative driven, realist, feature-length movies. However, digital developments could also be said to reinvigorate cinema. If we think of cinema as a kind of modular architecture which is comprised of the basic building blocks of light, space, (e)motion, touch, memory and not tethered to a specific medium, we begin to move towards the cinema as Benjamin saw it, a play room to train our senses.

Keywords: experimental cinema, installations, film memory, Walter Benjamin, film experience

Questions of ontology have haunted cinema (and photography) throughout its relatively short life. What made cinema magic, the ability to convincingly (and seemingly objectively) capture the world before the lens, also cast a shadow of dispersion: if an image could be created without the intervention of the human hand, how could this be Art? In addition to having to defend itself against claims that it merely was a form of tawdry mechanical reproduction, cinema has suffered an ongoing identity crisis as its delivery technologies (celluloid, electronic tape, pixels) come and go. As with VHS and Beta tapes, digital technologies have changed the way we produce,

distribute, and consume cinema. The fact that the reception of movies is increasingly a solitary experience, means that, largely, we are no longer movie-goers. Studying digital images at our desks, on planes, trains, and automobiles, or while waiting for the bus, we no longer participate in the experience once tied to watching movies. No longer an event marked with special significance, movies are just there, on demand, to be accessed at our convenience. And while there is surely a loss to be lamented (the passing of a part of culture as well as an aesthetic form), the argument that digital technologies sound the death knell of cinema seems somewhat shortsighted, particularly in light of the fact that what we still refer to as a 'film' in many cases is no longer, or never actually was, linked to celluloid. Given the shape-shifting nature of cinema, concerns over its demise seem to apply more to the commercial film than to cinema itself. A far more productive approach is to remind ourselves that there have always been multiple cinemas and that, arguably, digital technologies are providing a means of re-invigorating 'alternate' cinematic practices.

If early twentieth-century critic and theorist Walter Benjamin is to be believed, it is just such moments of technological crisis which provide opportunities to reinvigorate:

> The technical revolutions are the fracture points of artistic development; it is there that the different political tendencies may be said to come to the surface. In every new technical revolution the political tendency is transformed [...] from a concealed element of art into a manifest one. And this brings us at long last to the film.[1]

It would seem that the technological fault line cracks open, letting other modes of practice squeeze through the fissures and expand in the spot light. The technology of film, early commercialized, imitated well-established art forms such as the novel and the theater. In focusing on cinema's photorealist and storytelling potential, other ways of thinking and making with moving images became marginalized. Benjamin provocatively names these the 'forgotten futures' of cinema. In his phrase we can hear something of the sorrow and frustration he shared with many contemporaries: the hope and promise of this duplicating technology, once tangible, now tarnished; the apparatus atrophied and amputated. However, the phantom limbs of cinema twitch, often painfully, reminding us that they are not entirely or irrevocably relegated to the past.

In fact, these ghosts of cinema are there, always have been, in the very word itself. Variously, cinema is defined as the art of making movies; the

space of exhibiting film; and as shorthand for motion pictures generally. The term 'cinema' comes from the French *cinématographe* and German *kinematograph*, in turn derived from the Greek *kinema* (movement, to move) and *graphein* (to write). *Cineo*, which in Greek means to move, rouse, or summon, gives us the English 'cite', which produces such words as excite, incite, citation, recite, and cinema. In contemporary slang, 'kino' refers to playful touching when attempting to pick someone up. Cinema, then, includes five main constituents: light (to inscribe or cite with light), space, (e)motion (which would include audio, the result of moving air to create sound waves), touch, and memory (a re-citing). The one element that marks film as distinct from digital object – celluloid – does not appear in the list. Its omission is telling, for in speaking of cinema we often mean classical cinema – linear, realist, narrative-driven commercial films, produced in a studio system for 'conventional' viewing by spectators seated in a theater before a static screen.

But other models of cinema exist. If we consider cinema as a *Spielraum* or 'playroom', as Benjamin does, we then frame it as a space for training our faculties,[2] which can include a wide collection of media and methods that make great use of cinema's resources – light, space, (e)motion, touch, memory. In conceiving of cinema as an architecture, a structure comprised of building blocks that can be endlessly reconfigured, we are able to sidestep the ontological conundrum that plagues film.

In championing cinemas that challenge the dominant realist narrative-driven model of cinema, Benjamin seems to have been encouraging an 'expanded cinema'. The term, coined by Stan Vanderbeek in 1965, draws attention to what is rendered transparent in the mainstream; it often flaunts artifice and overt addressing of the audience. The audience, in fact, is often essential, being required to participate and interact with the work. Immersive, an expanded cinema privileges an embodied, sentient experience; shunning linear plot it implicates the 'viewer,' asking him/her to draw upon personal experiences.

Although expanded cinema is often described as emerging in mid-twentieth century with 'happenings' in New York and Europe,[3] the claim is shortsighted. Media archaeologists[4] have supposed that the roots of cinema lie in the wider array of sights, sounds, and spectacles that fill the modern metropolis. Shopping arcades, department stores, wax museums, and exhibition pavilions all excited the new "mobilized virtual gaze.".[5] In panoramas and dioramas, viewers were surrounded by scenes that shifted and shimmered with carefully executed lighting. Stereoscopes allowed for the experience of far-flung locations. Philosophical toys such as the

praxinoscope, zoetrope, thaumatrope, phenakistiscope, kineograph, and mutoscope, provoked larger questions of perception and knowledge. The magic lantern, precursor to the modern projector, similarly was put to use as learning device and as tool to mount multimedia spectacles (often involving multiple and rear projections, live performers, lights, and smoke). Such architectures created dynamic, even visceral, responses. In some ways early cinema was a 'parasite', leaching from established forms of entertainment and commodity.[6] Even as studio production became a reality at the end of the nineteenth century, cinema remained only one attraction amongst many, just another item competing for attention on a vaudeville playbill.[7]

Against what was emerging in mainline cinema Benjamin drew other connections between cinema and architecture. Giuliana Bruno has similarly outlined how the modern city dweller takes advantage of the 'spatiovisuality' in order to go 'site-seeing'.[8] These travels Bruno identifies as a haptic transport.[9] Tying motion to emotion, she reflects Benjamin's notion of 'innervation' as a visceral and palpable entanglement with cinema. If we understand the cinematic itself as a built environment, then, we can begin to think about how its structures might become available for other purposes, the incubation of ideas and bringing us to our senses, perhaps.

For Benjamin the mimetic faculty provided one such incubator. In drawing connections we play, but we play in such a way that we set aside the rules of unthinking diversion. In conceiving of cinema as a *Spielraum* or 'playroom,' Benjamin celebrates its capacity for bodily engagement. The sensorial training, Benjamin supposes, expands awareness of ourselves, the spaces we inhabit, and heightens our skirmish with technologies. For Benjamin, the cinematic apparatus could provide an "alignment of reality," closing the gap between bodily experience and abstract representation.[10] Benjamin was not alone in a desire to activate the forgotten futures of film.

Early Twentieth-Century Avant-Garde

The early twentieth-century European avant-garde was caught up in the relatively new phenomenon of film. The Futurists recognized film as a medium that would dramatically reshape the world. In their hands, it becomes "a school of joy, of speed, of force, of courage, and heroism" to "sharpen" the sensibility and "quicken the creative imagination."[11] The Surrealists found cinema well suited to their oneiric explorations in such

works as René Clair's *Entr'acte* (1924), Germaine Dulac's *La Coquille et le clergyman* (1928), or *Un chien andalou* (1929) by Salvador Dalí and Luis Buñuel. Joseph Cornell's *Rose Hobart* (1936) is closest to an expanded cinema in its desire to explore the basic rudiments of cinema. Cornell extracts the footage of Rose Hobart, female lead in East of Borneo (a pulp film from 1931 directed by George Melford), and reedits it into a twenty-minute movie. Cornell's distilled narrative, stripped of the original sound, evokes the wistful, magical quality for which his better-known box-collages are noted. To emphasize a melancholic atmosphere, Cornel projected the film through a blue-tinted lens. In that 'tampering', Rose Hobart nods to pre-cinematic practices such as hand-colored magic lantern slides and early tinted film stock. During screenings, Cornell would play a second-hand copy of Nestor Amaral's Holiday in Brazil on a turntable, bringing Rose Hobart into the performative territory of 'live cinema'. Surrealists generally saw viewing movies as a means to disrupt the status quo, as in the 'cinema-crawl', when they randomly entered theaters during a screening and then impiously left for another theater in mid-showing. In opting for a choose-your-own-adventure, Surrealists actively shaping an expanded cinematic experience.

Dada came closest to matching Benjamin's hopes for film. In Benjamin's estimation, Dadaists understood what most mattered, that film's reproductive and animating capabilities changed art fundamentally.[12] Through a bewildering array of endeavors, the Dadaists set out to turn 'Art' on its head and, with it, the system that enabled a bourgeois culture of hollow spectacle. Poems, performances, objects, collage, photomontage, manifestos, 'word salads', and films all provided fodder for their anti-art. Although the Dadaists did not widely make use of film, one notable work, Marcel Duchamp's *anémic cinéma* (1926) appears as a collection of disks, upon which Duchamp painted off-center circles or texts, set spiraling by a record player motor. Essentially an optical toy, *anémic cinéma* strips cinema to its constituent elements. Its optical illusions and textual puns play with what is there and not there, the uncanny tension of presence and absence that makes cinema possible.

Fellow Dadaist Hans Richter's *Film Ist Rhythmus: Rhythmus '21* uses only animated rectangular shapes to play with positive and negative space, scale, and motion. Richter's explorations of rhythmic movement requires the viewer to consider the illusionistic nature of film. Gabriel Cuéllar[13] speculates that Richter's sporting with light, space, and movement provided direct inspiration for Mies van der Rohe's building. Not only did Van der Rohe appreciate film as a type of architecture in its own right, he also

saw a means to promote a program of New Living (affordable buildings constructed from glass and steel which enabled light, spacious, healthful environments). As early as 1914, Bruno Taut proclaimed, "[t]he moving cinematographic recording essentially substitutes for a tour around and through the building."[14] Architecture addressed the power of coupling the virtual with the real, much as in Hale's Tours and Scenes of the World, where 'voyagers' seated in a train car suffused with visual, auditory, and tactile sensations could enjoy virtual tours.[15]

Laszlo Moholy-Nagy, a member of the Bauhaus, one of the earliest multimedia artists, moved readily amongst painting, theater, photography, architecture, and film. In his thinking, "[p]Photomontage, superimpositions, diagrams, explosion, phantom, x-ray, cut-away techniques, stroboscopic motion projections and other combinations may enlarge" the art work's scope "tremendously."[16] Embracing new technologies, particularly photography and film, Moholy-Nagy was essentially working within a kinetic cinema. A frustration with older models is evident in his words. Film wasn't "keeping pace," largely because of its "absurdly primitive"[17] conceptions. And so, "[t]he rectangular screen of our cinema theaters is nothing more than a substitute for easel or flat mural painting."[18] Far more exciting possibilities exist for Moholy-Nagy. In his *Light Space Modulator* (1922-1930), he employs a rotating contraption built from various materials, some semi-transparent, others perforated, as a prism to release light and shadow in luminous movement across a surface. By shining light onto the Modulator Moholy-Nagy created a shadow play which danced across surfaces – walls, clouds of smoke – to enhance the "observable process viewed by the acting persons themselves."[19]

Moholy-Nagy believed it was imperative to free Art from its pedestal and bring it into the average person's life. Echoing Benjamin, he claims that art's task is to bring about "an education of the senses, the ability to articulate feeling through the means of expression."[20] Despite the Expressionist tone we may detect here, Moholy-Nagy champions the artist-as-engineer. The artist needs to be a 'seismograph of events and movements pertaining to the future.'[21]

The Situationist International (SI), a European avant-garde movement in operation from 1957-1972, similarly sought reverberations in movement and image. Any "true," direct, lived experience was in the SI's estimation no longer possible. SI worked to bring about nothing less than a new world, one in which its citizens would be open, engaged, creative, and fulfilled in their desires. A primary strategy was to construct a "situation" whose "obviousness" drew so much attention to itself it would shake the everyday into something of "superior passional quality."[22]

The SI sought in their practice of *détournement* to devise acts of provocation. In deliberately tampering with cultural artifacts, they aimed to turn the capitalist spectacle against itself. Although the *détournement* (an early example of 'culture jamming')[23] could be applied to any instance of popular media – comic books, photo-romans, pornography, bill boards – cinema was the SI's medium of choice. Cinema, they felt, was primed for subversion. In the SI's activities, we can hear once more the old lamentations that "[t]he cinema, which is the newest and undoubtedly most utilizable means of expression of our time, has stagnated for nearly three quarters of a century."[24] However, the SI detected within an atrophied medium the stirrings of potential. The SI figured to use kitschy material shot through with commercialism – 'B' movies, newsreels, previews, or even better still, filmed adverts – in order to expose the impoverished state of culture.[25] As with Benjamin, matters of literacy come into play: "We should appropriate the first stammerings of this new language,"[26] SI member René Viénet tells us. Recognizing the potential of cinema to undermine "the society of the spectacle," Viénet proposes an interesting twist on Benjamin's call for writers to take up photography: the SI "should henceforth require that each situationist be as capable of making a film as of writing an article."[27]

The results can be seen in the efforts of Debord and Viénet. Debord's *Hurlements en faveur de Sade* (1952) consists only of a soundtrack. Running just over an hour, this 'film' offers a series of 'nonsensical' utterances punctuated by long silences. Visually, we are presented with a blank, white screen each time a new auditory segment occurs. It then cuts abruptly to an inky black screen and silence. The lack of images, the prominence of 'foolish' utterances, and the force of extended silences unnervingly upset our expectations and try our patience. 'Watching' *Hurlements* we drift through silence only to be distracted back to the film when we hear the narrator return. We witness the flip from black screen to white. The fractured *Hurlements* seems distilled in the last, strangely poetic line – "Like lost children we live our unfinished adventures."

Viénet takes another tack in *Can Dialectics Break Bricks?* (1973). He appropriates *The Crush*, a 1972 martial arts film by Tu Guangqi, and on it overlays his own subtitles to produce a critique of capitalism and the class system. Although sober in subject matter, Dialectics, in true Situationist spirit, is impishly playful. By imposing his own subtitles, which obviously do not 'match' the images, Viénet draws our attention to the conventions of cinema which have become invisible to us. In refashioning a 'pulp' film through self-reflexive strategies, Viénet creates a humorous and critical *détournement*.[28]

Mid-Century Avant-Garde

As with their predecessors, artists in the 1960s and 70s continued to push the boundaries, exploring a 'personal cinema'.[29] With the advent of video and computers, still other artists[30] sought to reach beyond mainstream conventions through their explorations of these new technologies. In his book *Expanded Cinema* (1970), Gene Youngblood speaks of the forceful manner in which technologies alter our ways of communication. Similarly, Peter Weibel and Valie Export exploit what happens when conventional shooting, editing, and projection is abandoned.[31] In Export's street performance, *Tapp-und Tastkino* (Touch Cinema) (1968), passers-by are invited to reach behind the curtain of a small stage which hides Export's breasts. Touch raises questions of voyeurism, the haptic nature of cinema, and the commodification of women. Crucially, it reminds us that cinema does not necessarily need celluloid.

Robert Rauschenberg (among many others),[32] had been investigating the extension of technologies beyond our "most extravagant visions."[33] Rauschenberg, in collaboration with other artists,[34] founded E.A.T. (Experiments in Art and Technology) in 1967 to close the gap between art and science.[35] Continuing to extend and enhance the participant's experience, Jeffery Shaw and Stan Vanderbeek created purpose-made structures onto which images were projected. Shaw's *MovieMovie* (1967), a "complex visual theatre" and Vanderbeek's *Movie-Drome* (1963-1965), posited a cinema able to function as "a world tool for art and education [...]."[36]

The desire to bring art into the everyday, to 'expand' our sensory experience and to augment our knowing, was one of the main focal points of Expo '67. Like all world fairs, Expo '67 (hosted by Montréal, Canada) paraded the latest and greatest in technological innovations. A showcase for novel visions manifest in architecture and moving images, Expo '67 was about a new way of seeing and understanding space. The 'Space-Frame' Fair showcased Le Corbusier's 'curtain-wall', which permitted large, light, airy spaces.[37] Canadian architect Moshe Safdie's *Habitat 67* dramatically re-imagined urban housing as a socially responsible Bauhaus-esque apartment complex.

Perhaps it was film more than any medium at Expo '67 that challenged expectations. Film at Expo '67 took on forms that tested belief in fixed screen and stationary observer. Many of the works challenged established notions of what cinema was. The Canada 67 exhibit consisted of nine wrap-around screens, which created a "cocoon of sight and sound" for audiences of up to 1,500 people; Labyrinth was a National Film Board of Canada installation with a screen eight stories tall; *A Place to Stand* by Ontario filmmaker

Christopher Chapman included as many as fifteen images in one 70mm frame; the Czech pavillion showcased Kino-automat, arguably the first truly interactive film, which invited the audience to vote on how the film should proceed, as well as staging the 'diapolycran', which projected slides onto moving cubes in an 'hallucinatory' kinetic installation.

The rhetoric of the 'new' that colors reports of Expo '67 may seem misplaced given earlier developments. It may be legitimate, however, since for the first time alternative techniques were being experienced en masse.[38] The excitement was palpable and promising: "it became possible to envision a world in which all the resources previously available to private industries and show business – film, lighting, models, carefully organized environments"[39] would now be available to the average person.[40]

Twenty-first Century

There has been a continued lineage of 'alternate' cinematic practice that deals with those basic quantities – light, space, (e)motion, touch, and memory – whether through celluloid, pixels, or other media. More recently, the desire for more fully realized environments has been facilitated by increasing access to sophisticated computer tools and by the advent of the internet. Digital technologies are able to amplify and expand film in a way that exploits the magical inherent in the medium, in fulfillment, perhaps, of Benjamin's words: "Every epoch, in fact, not only dreams the one to follow but, in dreaming, precipitates its awakening."[41] Rather than shutting down cinema, these new and emerging technologies, it would appear, recall the possibilities Benjamin saw within a "revolutionary medium."

Benjamin, with many of his contemporaries, identified in modernity a desire to strip away the irrational (magical, superstitious, and traditional) ways of the past. The result, he feared, produced a "poverty of experience."[42] With no cultural or generational memory to guide us, Benjamin the unconventional Marxist, argued that we are unable to navigate the world. Worse still, what replaces these 'quaint' old memories, Benjamin tells us, is the myth of capitalism with its promises of wealth and health acquired through consumption. The sustainment of this 'status quo' was in Benjamin's eyes devastating, but film, he believed, could act as a remedy. Film, for him, was revolutionary in that it stripped the sanctifying 'aura' of the object it recorded; in doing so, film was able to wrench art from its bourgeoisie slumber and breathe new life into its representations.[43] And, as a copying machine, it presented a seemingly unmediated view of the world. Further,

as a collective experience, film offered a way to begin to fill the void of rationalism and shape new social bonds, new ways of understanding.

Magical Mimesis

As many have observed, the early (Western) avant-garde[44] was troubled by claims for the autonomy of art and sought to find a way to close the gap between the aesthetic and the everyday; the task at hand was not merely to represent the world, but to change it.[45] For Benjamin, mimesis was the tool for the job: "Standing behind the doorway curtain, the child becomes himself something floating and white, a ghost."[46] In mimicry, we do not merely imitate, we become the object of imitation. Benjamin's understanding of the act of representing entails not mere copying of world, but "creates the possibilities for the world to exist otherwise."[47] Entwined in Benjamin's mimetic faculty are "residues of the magical correspondences and analogies"[48] in recognizing similarities between, say, astrology and graphology. Similar links to magic and the occult are prevalent in the work of many figures in the early twentieth century.[49] Leigh Wilson postulates in Benjaminian mode that rather than being nostalgic or fetishistic, they sought to recuperate "a productive magic; productive because it was a magic that fundamentally understood that the mimetic is able to produce, not just an inert copy, but an animated copy powerful enough to enact change in the original."[50]

The power wielded by this magical copy comes from its 'honesty'. There is no pretense here, no pretending, quite the opposite; the copy, *as copy*, paradoxically flaunts its duplicitous existence. As Tom Gunning draws out in his writing on a cinema of attractions, early film *shows* us rather than tells us.[51] It "directly solicits spectator attention, inciting visual curiosity, and supplying pleasure through an exciting spectacle – a unique event, whether fictional or documentary, that is of interest in itself."[52] This exhibitionist cinema celebrates its own artifice. Wilson makes the point that while it might seem that realism would constitute a more faithful mimesis (a truer copy), the fact that it cannot admit to being a copy without destroying its illusion, means that it lacks the magical mimesis which marks cinemas of attraction and the experimental and expanded cinema that followed.[53]

The digital supplies a copy extraordinaire whose level of abstraction results in a troubled representation. As zeros and ones, digital raw data can take on any form (text, image, sound, 3D physical object, movement, etc.). The digital, it would seem, is a shape-shifter, capable of remarkable feats of slight-of hand. However, to make manifest the end digital 'product,'

whatever that may be, it is necessary to write the instructions which will tell the computer what to do and how to do it. We might well think of computer coding as an example of Benjamin's "non-sensuous similarity."[54] Language, in Benjamin's estimation, is the last vestige of the once-powerful mimetic faculty. It is "a medium into which the earlier powers of mimetic production and comprehension have passed without residue, to the point where they have liquidated those of magic."[55] It would seem that language has distilled and channeled earlier magical practices. Benjamin is at pains to emphasize that this is about more than merely describing the world; we use language to know and construct the world. Language is a model, a copy of the world, but within its duplications an inherently transformative element emerges through its slippery semiotics. Similarly, and more obviously perhaps, computer programming involves translating from human language to machine language; in that transaction, the language is transformed into something that in no way resembles the original instructions, but nonetheless maintains a "non-sensuous similarity" between language and object.[56]

Through kindred means *The Space Beyond Me* (2010) explores complicated relationships between time and space, representation and 'reality'. A 16mm camera, which artists Julius von Bismarck and Andreas Schmelas have modified with a UV-light projector, sits in the center of a circular room, the walls of which have been coated with phosphorescent paint. Using open-source software, von Bismarck and Schmelas have programmed the apparatus to read the movements used in the original celluloid recording and then to duplicate them. As the digital projection migrates through the room, it leaves a ghostly trace on the light-sensitive walls. Images are interrupted by their own after-burn, which lingers briefly before fading away. The movement of the instrument emphatically scores the nature of cinema: one shot obliterates the next, one movement removes something from the frame. Like a high-tech spirit guiding an Ouija board, *The Space Beyond Me* effectively uses digital technologies to connect past and present. Or perhaps these luminous apparitions are more akin to the invisible text written in lemon juice, which becomes legible once held up to a hot flame or bulb, letting us "read what was never written"[57] there between times and places, originals and representations.

Hauntings

Jeffery Sconce has spoken to such tracings in our uneasy preoccupation with (electric) technologies, arguing that we repeatedly associate technologies

of communication with the notion that they are in some way inherently haunted and connected to the paranormal.[58] Much of our anxiety, it seems, stems from the verisimilitude these devices can produce (the reanimation of voices and images of the dead or distant). Once more, the disconcerting power of mimesis becomes evident; the more convincing the copy, the more uncanny it is. Something of this anxiety comes through in Kelly Richardson's *The Erudition* (2010). Projected on three large screens set in a slight semi-circle, The Erudition blends photographic footage of the desolate landscape in southern Alberta, Canada, with computer-generated trees that glow a ghostly transparent blue as they slowly sway in a virtual wind. We are lulled into an almost trancelike state by the graceful to-ing and fro-ing of the tree tops. The oneiric sense of a suspended present is shattered when trees begin to flicker and disappear, only later to re-emerge in their uncanny landscape. Richardson plays with cinematic language – time, space, light, movement, the virtual, and the 'real' – to create a world that is aesthetically sumptuous and conceptually chilling. Richardson's is a world where life, long stripped away, exists as virtual projection, perfect in its eternal sameness, the reminder of its artifice apparent only in its moments of dissolving.

Other scholars have persuasively shown that the historical relationship between magic and film is there to be found.[59] Cinema grew out of a culture of entertainment in which secular magic played a significant role. Not only was cinema associated with vaudeville and spectacle, including acts of conjuring, illusion, and spiritualist entertainments,[60] figures such as Méliès[61] and Houdini were illusionists turned filmmakers. Further, the very fact that cinema could capture and animate – 'It Is Alive!' – imbued it with an uncanny status. At the same time, the early twentieth-century avant-garde's fascination with the 'primitive' served to channel an antidote to the rationalism of modernity.[62] Cinema, then, is haunted by magic. Artists such as Zoe Beloff and Heidi Kumao make use of precinematic technologies and approaches, reminding us of cinema's technological and ideological ghosts. As philosophical toys, these devices of wonder hover between education and entertainment, prompting us to consider those ongoing troublesome questions of representation and perception.[63] Kumao's *Cinema Machines* (1991-1999), for instance, incorporate the zoetrope and "sabotaged household object[s]."[64] In Kept Kumao projects into a shoebox a repeating animation of a housewife (shades of Cinderella) sweeping. We marvel at the miniature silhouette's plucky resolve to keep debris at bay, even as we understand she is doomed to endlessly sweep out the shoebox she lives her looped life within. The loop itself is a form of magic (think of the fascinating Mobius

strip), particularly when it is impossible to tell, through the virtuosity of editing, where the clip begins or ends.[65]

The standard stuff of pre- and early-cinematic devices, the loop as a GIF,[66] gained popularity in the late 1980s with the emergence of the Web. After falling out of favor for a couple of decades, the GIF has re-emerged as a legitimate aesthetic form. Any number of artists, such as Kevin J Weir, Bill Domonkos, and Scorpion Dagger, all manipulate images from the public domain to form sophisticated and complex looping animations which are often humorous, contemplative, and disturbing.[67] The cinemagraph,[68] sophisticated sister to the humble GIF, is an unnerving creature. Part photo, part video, the cinemagraph carves out a liminal life for itself. There is something inherently 'wrong' with these images. Essentially, the image is a still photograph, but within this static world one element has been animated and looped: a model's hair slowly flutters or a passing taxi's reflection caught in a café window, for instance. The enchantment resides in a conceptual paradox: we know that these two temporal worlds cannot simultaneously exist, yet here they are, fused into a seamless fabric. Ironically, as it draws us in to its (usually glamorous) world, seducing us with select movement, the cinemagraph prompts us to consider heady questions of the infinite and finite.

Playroom

As we have noted, Benjamin prizes the mimetic faculty for its transformative powers. Play is integral to his notion of an art which can involve people in meaningful ways. Locked into what is prescribed and permitted "means to have sacrificed one's idiosyncrasies, to have forfeited the gift of distaste."[69] In something like obstinance we experiment, we set aside the rules of the expected and open ourselves to (im)possibility. In thinking of cinema as a *Spielraum* or 'playroom,' Benjamin recognizes its capacity to activate bodily perception. The sensorial training Benjamin locates in film expands awareness of ourselves and the spaces we inhabit. It also alerts us to the means by which we shape technologies and are shaped by them. The exercise is one that Benjamin surely would have recognized as available in digital media too. For Benjamin, the cinematic apparatus could provide an "alignment of reality" that closed the gap between experience and representation, a "process of immeasurable importance for both thinking and perceptions."[70]

Arguably, it is within that activity that digital technologies offer the widest scope to house Benjamin's *Spielraum* and its forgotten futures of

cinema.[71] Erkki Huhtamo helps us to remember the future when he traces a lineage of interaction back to the Industrial Revolution, arguing that the popularity of philosophical toys at the time allowed people to "develop a playful and intimate relationship with optical technology."[72] His understanding would further accord with Benjamin's notion of film as a sensory training ground that hums with "innervation." Interactive works such as Tine Bech's *Catch Me Now* (Interactive Light Installation, 2010), almost as if in fulfillment of Benjamin's words, rely on that kind of physical and sensual engagement. Catch Me Now deploys a roving spotlight that invites us to apprehend its movements. Its circle changes color and widens, allowing room to perform in the ludic limelight. Scott Snibbe's works similarly rely on the audience. Often incorporating the audience's shadow into projected scenes, Snibbe plays with time and space, presence and absence, giving us room to play. In *Boundary Functions* (1998), for example, lines of light are projected as a Voronoi diagram (a way of explaining regional difference) on the floor to demarcate the boundaries between participants. As each person advances or recedes, their personal space (the edges of their boundaries marked as coinciding with the edges of a mobile Voronoi map) adjusts in relation to other participants. Importantly, digital technologies are used here to deliberately upset a paradigm of digital culture which has no use for the human body: "[…] *Boundary Functions* is a reversal of the lonely self-reflection of virtual reality, or the frustration of virtual communities: here is a virtual space that can only exist with more than one person, and in physical space."[73]

What makes work like Bech's and Snibbe's possible is the emergent Internet of Things (IOT), which links physical objects embedded with sensors to the internet. The applications (and implications)[74] of this new 'smart' world are only beginning to be explored, but what is evident is that the body has been put back into the digital equation. Whether through wearables (computers worn as accessories, as in a smart watch or health monitor, or embedded in clothing and allowing fabric to react to gusts in our moods, the weather, or an incoming text, for example), mattress pads which learn our sleep patterns, or lighting which adjusts to our moods, these new 'aware objects' listen for and to our physical presence. Designer David Rose has set out to address the clunkiness in many of these objects and interfaces by creating what he thinks of as 'enchanted objects'. Enchanted objects, Rose tells us, fulfill basic human desires and fantasies. These are the stuff of fairy tales: magic slippers, a crystal ball, a purse that never is depleted. In paying attention to the affordances of the object (those attributes inherent in all materials) Rose infuses his functional objects with sensory pleasures. A

glowing orb gently alerts us to our energy consumption, or a pill bottle lets our loved ones know if we have not finished our prescription, for example.[75]

The (re)emergent Maker culture, too, has helped fuel interactive digital work. Maker culture essentially refers to artists, designers, scientists, and tinkerers who embrace a DIY (do it yourself) ethos. As computer components continue to shrink in size and cost, microcontrollers (a miniature computer) such as the Arduino, allow the physical world to connect, through sensors, to and from the virtual. *My Little Piece of Privacy* (2010), an interactive installation by artist Niklas Roy, uses a microcontroller and sensors to move a curtain that is hanging in his studio window.[76] As passers-by are detected by the sensor, the information is parsed by coded instructions and relayed to a motor which whips the lace curtain along its rod to stop in front of the person on the other side of the glass. As people try to peek around the edges, the curtain reacts and adjusts to block their view. The setup is simple, but effective. It is a primitive cinema of sorts, but one which frustrates our attempts to view. Vexatiously, the screen is screened. By interacting with the mundane fluttering fabric, we step out of the ordinary and into an unexpected game of hide and seek. The fact that Roy's work occurs in a public place, rather than a gallery, is significant. Rendered more accessible, the work may "drag people out of their daily drudgery for a sublime moment and illicit a playful interaction that they are too self-conscious to do in a gallery."[77] Benjamin tells us that in diminishing the elite status of art (destroying its sacrosanct aura) we liberate it into new permissions[78] – into a childlike immunity to inhibitions perhaps. Andrew Polaine would agree when he aptly observes that the most effective work (most affective too?) is often very "childlike" in its overt and "simple" playfulness.[79]

It is a telling fact that major corporations have realized that a feature-length narrative-driven movie, no matter how many CGI or 3D effects it makes use of, can no longer draw in people as it once did. Increasingly, production companies are moving into alternate reality games (ARGs) and transmedia projects that tell stories simultaneously on multiple platforms to supplement their motion picture releases. ARGs conflate virtual and embodied play to create magnified, and often intensely immersive experiences for their players. ARGs can include a handful of players or hundreds across the globe, their puzzles and clues offered up through some combination of social media, websites, radio, television, and 'real world' objects and events. Central to all ARGs is a collaborative exchange of information in order to crack the riddle.[80]

Because so much interactivity incorporates the ludic, at its best it is able to transform the quotidian, perhaps in greater fulfillment of Benjamin's

desire to see the forgotten futures of film come to life. In bringing us out of the ordinary, we brush up against something we might call magical. It is worth noting During's claim that locating "secular" or "modern vernacular magic"[81] or "technically produced magic"[82] in the everyday, creates an inherent paradox. In blurring the lines between the commonplace and the extraordinary, we risk dissipating the power of the Other and rendering the concept of magic trivial. However, During reassures us, "[t]his constraint also allows magic traditions, characteristics, and modes to be engaged for worldly purposes – to express desires, fears, or critiques, to shape utopias, and to amuse."[83]

A similar ambivalence colors Benjamin's thought. As much as he lamented the world that was being eclipsed by an impoverished sense of being in the world, he recognized within new technologies and modes of entertainment possibilities for change. Uneasy with Benjamin's fascination with mass and irreal culture, theorist and friend to Benjamin, Theodor Adorno, accused Benjamin of being "located at the crossroads of magic and positivism. This spot," he warns, "is bewitched."[84] In Adorno's estimation, capitalism's beguiling torpor deadened any sense of direct experience in the world; the (mindless) consumption of entertainments, advertising, and commodities was mere illusion of a lived life. Benjamin, rag picker of materialist history, saw the world as a Wunderkammer, a collection of curiosities which were wonders as well as horrors.[85] Popular phenomena – toys, movies, shopping arcades, hashish, and the city itself – had something to say, if only we listen. But this hearing requires an embodied reception; we need to be sympathetic to the reverberations around us. Proceeding metaphorically to draw out the disparate connections of the material world, Benjamin conjures a critique of modernity that inherently folds into itself the magic of mimesis. The world, in Benjamin's estimation, *is* bewitched; how can it not be? Representation, mediation, and perception are, by their very nature, beguiling creatures. We would do well to heed During's remarks that "modern culture has been built upon the seductions of secular magic" and that further, "[t]hinking about secular magic reminds us then that we need to consider global modernity as having been shaped in part by tricks and fictions which are border posts at frontiers to a supernatural domain we can never map."[86] In the looping and sticky similarities Benjamin presents us, he performs his own magic *show*.

I propose that we might understand digital expanded cinema as occupying the bewitched spot Adorno cautions against. Hans Ulrich Gumbrecht speculates that

> [...] at the intersection between some possibilities offered by contemporary technology with that longing for re-enchantment [...] we have a chance of discovering the potential for a much more dispersed and decentralized map of aesthetic pleasures, and of a much less 'autonomous', stale and heavy-handed style and gesture of Art.[87]

Perhaps the digital, in its ubiquity and flexibility, offers us the opportunity to follow Gumbrecht's unofficial map, and to think of contemporary expanded cinema, in its many guises, as an apt guide. Expanded cinema, by definition, exists as something liminal – not quite this, not quite that. It lies in the space in-between, relies on the interstices of activation. In cinema's twilight our bodies are given presence and we are invited sensually to experience cinema as an enchanted object.

Notes

1. Benjamin, 'Reply to Oscar A.H. Schmitz', in *Selected Writings, vol. 2*, 16-17.
2. Benjamin, 'The Work of Art in the Age of Its Technological Reproducibility', in *Selected Writings, vol. 3*, footnote #22, 127.
3. See Youngblood, *Expanded Cinema*.
4. Tom Gunning, Errki Huhtamo, Barbra Stafford, Vanessa Schwartz, Anne Friedberg, and André Gaudreault, for instance.
5. Friedberg, *Window Shopping*, 2.
6. Gunning, 'The World as Object Lesson: Cinema Audiences, Visual Culture and the St. Louis World's Fair, 1904', 423.
7. Gunning, 'The Cinema of Attractions'. Arguably, digital technologies foster something of a return to a cinema of attractions for moving images. Movies that reside on our tablets and mobile phones, for example, are just one of the many diversions these devices make available to us.
8. Bruno, *Atlas of Emotion*, 17.
9. *Ibid.*, 6.
10. Benjamin, 'The Work of Art in the Age of Its Technological Reproducibility', in *Selected Writings, vol. 3*, 105.
11. Marinetti, Corra, Settimelli, Ginna, Balla and Chiti, 'The Futurist Cinema'.
12. Benjamin, 'The Work of Art in the Age of Its Technological Reproducibility', in *Selected Writings, vol. 3*, 109.
13. Cuéllar, 'Moving in Black and White'.
14. Quoted in Janser and Rüegg, *New Living*, 16.
15. Fielding, 'Hale's Tours'.
16. Moholy-Nagy, *Vision in Motion*, 245.
17. *Ibid.*, 283.

18. *Ibid.*.
19. *Ibid.*, 280.
20. *Ibid.*, 'Foreword' (n.p.).
21. *Ibid.*, 30.
22. Debord, 'Report on the Construction of Situations and on the International Situationist Tendency's Conditions of Organization and Action', 39.
23. Coined in 1984 by the band Negativland, culture jamming or 'subvertising' is a tactic used to disrupt and critique corporate culture. In particular, these interventions challenge the monopoly corporations have on public space and the power they exercise often to lock down culture through copyright.
24. Viénet, 'The Situationists and the New Forms of Action Against Politics and Art', 275.
25. *Ibid.*, 273-277, 276.
26. *Ibid.*, 276.
27. *Ibid.*, 277.
28. Artists such as Martin Arnold's *Alone: Life Wastes Andy Hardy* (1998); Peter Tscherkassky's *Outer Space* (1999); Bill Morrison's *Decasia* (2002); Peter Delpuet's *Lyrical Nitrate* and *The Forbidden Quest* (2004) similarly use found footage and existing movies, reediting them, often in looping segments, to draw attention to the materiality of films.
29. Stan Brakhage, Valie Export, Stan Vanderbeek, to name but a few.
30. Peter Weibel, Nam June Paik, Gene Youngblood, Michael Snow, among them.
31. Export, 'Expanded Cinema as Expanded Reality'.
32. Michael Snow, Stan Brakhage, Bill Viola, Malcom Le Grice, Carolee Scheeman, for instance.
33. Youngblood, *Expanded Cinema*, 41.
34. Rauschenberg's collaborators on EAT were Robert Whitman, Billie Klüver, and Fred Waldhauer.
35. E.A.T.'s mandate echoes that of the Bauhaus in its desire to fuse art, technology, and industry to create a better world for all. Klüver and Rauschenberg, 'Experiments in Art and Technology'.
36. Vanderbeek, 'Notes for Movie-Drome'.
37. Le Corbusier had designed buildings which employed vast walls of glass as early as 1922 and Bauhaus made use of a glass curtain wall designed by Gropius in their Dessau school in 1925.
38. Attendance for Expo '67 was 50,306,648, "second only to Paris France which had 50,860, 801 visitors in 1900." http://expo67.ncf.ca/expo_info_corner.html.
39. Fulford, *Remember Expo*, 95.
40. It would be another three decades before the cost of gear significantly decreased and, along with the Web, which allowed for the promotion and distribution of works in unprecedented ways, made it possible for the democratization of technology to really gain any traction.
41. Benjamin, *The Arcades Project*, 13.

42. Benjamin, 'Experience and Poverty', in *Selected Writings, vol. 2*.
43. Benjamin, 'Little History of Photography', in *Selected Writings, vol. 2*, 518.
44. Buck-Morss, Wilson, Moore, and Gumbrecht among them.
45. Benjamin's sentiment echoes Marx's. See Marx's text 'Theses On Feuerbach' in which he states: "The philosophers have only interpreted the world, in various ways; the point is to change it." http://www.marxists.org/archive/marx/works/1845/theses/theses.htm.
46. Benjamin, *One-Way Street*, 74.
47. Wilson, *Modernism and Magic*, 104.
48. Benjamin, *One-Way Street*, 161.
49. For a good summary of how the work of many key figures is linked to magic, see During, *Modern Enchantments*, 25-32.
50. Wilson, *Modernism and Magic*, 1.
51. Gunning, *The Cinema of Attractions*.
52. *Ibid*., 58.
53. Wilson, *Modernism and Magic*, 120.
54. Benjamin, 'On the Mimetic Faculty' in *One-Way Street*, 161-163.
55. *Ibid*., 163.
56. See Ian Bogost's article 'The Cathedral of Computation: We're not living in an algorithmic culture so much as a computational theocracy'. Online: http://bogost.com/writing/the-cathedral-of-computation/. Bogost argues that we have fallen into a pattern of using metaphors of technology to turn algorithms into a theology: "In its ideological, mythic incarnation, the ideal algorithm is thought to be some flawless little trifle of lithe computer code, processing data into tapestry like a robotic silkworm."
57. Benjamin, *The Arcades Project*, 416. The phrase, "to read what was never written," which Benjamin cites several times in his writings, is German writer Hugo Hofmannsthal's.
58. Sconce, *Haunted Media*.
59. See During's *Modern Enchantments* and Moore's *Savage Theory*.
60. Interestingly, many of the acts which were of a 'supernatural' flavor, were actually put on by disbelievers, those such as John Nevil Maskelyne, Washington Irving Bishop, and Harry Houdini, for example wanted to debunk the practice and prove mediums, mind readers, and their ilk to be charlatans and imposters (During, *Modern Enchantments*, 135-177). In another interesting twist of history, Houdini, after his career as an escapologist waned, took to making movies as writer, filmmaker, and actor (During, *Modern Enchantments*, 174-177).
61. It is interesting to note, as During points out, that Méliès was suspicious of narrative film for the same reasons which still haunt cinema today: "And once its status as an illusion was not acknowledged and motivated within the plot, film became a deception. In this respect, Méliès thought that film broke with secular magic's core caveat: an implicit or explicit admission that any presented illusion or trick is indeed and illusion or trick." (During, *Modern Enchantments*, 170).

62. Moore, *Savage Theory*, 14-18.
63. Magic itself occupies just such as state: through slight-of-hand and illusion, the magician prompts us to consider how what we have seen (or, more accurately, what we thought we saw) could be possible. Our conscious (we're aware that we're being duped into seeing something that isn't really there, precisely as that deception is taking place before our very eyes) is at odds with our perception (but I saw it disappear! How did she do it?) and the two states, seemingly impossible to reconcile, enter an uneasy coexistence.
64. Kumao, 'Cinema Machines'.
65. Lev Manovich, of course, has argued that the loop itself constitutes a narrative engine, as well as making possible computer programming.
66. GIF – Graphics Interchange Format, a lossless compression technique invented in 1987 which supported transparency and animation. The combination of animation, quality, and small file size made the GIF popular with those working with the relatively new world of the World Wide Web, which until that point hadn't been equipped to deal with much more than text.
67. See examples of their work at: http://kevinjweir.com, http://www.bdom.com, http://scorpiondagger.tumblr.com.
68. Cinemagraph™ © 2011-2012 Jamie Beck & Kevin Burg. Beck and Burg came up with the format when working in the fashion industry in an attempt to infuse the still photograph with more visual interest. Although they copyrighted the name in 2011, the process of producing these hybrid images had been around several years prior. http://cinemagraphs.com/about/.
69. Benjamin, 'Left-Wing Melancholy' in *Selected Writings, vol. 2*, 424.
70. Benjamin, 'WOA 2', *Selected Writings, vol. 3*, 105.
71. It is important to stress that digital technologies, of course, don't invent interactivity, but rather, as is the case with much that characterizes the digital, allow for an expansion (and exacerbation) of earlier practices. Although all art, it has been argued, is inherently interactive, I'm thinking here of Aaron Smuts' understanding of interaction as something that is neither completely random, nor completely controlled. Aaron Smuts, "What Is Interactivity?".
72. Huhtamo, 'Trouble at the Interface', 2.
73. Snibbe, 'Boundary Functions'.
74. RFID (Radio-frequency Identification) technology is a now well-established means for connecting the 'real' and the virtual. Like barcodes or QR (Quick Response) codes, RFID uses a tag and a reader to link information to objects. However, RFID tags needn't be visible. Though commonly used to track the shipment of goods they are rapidly emerging in other applications – transit passes, business loyalty cards, pet identification, vehicle-theft prevention, as well as tracking people. RFID, NFC (Near Field Communication), and the increased surveillance and data gathering that a networked world brings with it raise legitimate concerns over what information is gathered by whom and what happens to this data.
75. Rose, *Enchanted Objects*.

76. Niklas Roy, 'My Little Piece of Privacy'. Online: http://www.niklasroy.com/project/88/my-little-piece-of-privacy.
77. Polaine, 'Lowbrow, High Art', 7.
78. Benjamin, 'The Work of Art in the Age of Its Technological Reproducibility' (1936) in *Selected Writings, vol. 3*, footnote #22, 127.
79. Polaine, 'Lowbrow, High Art', 4.
80. See Frank Rose's *The Art of Immersion*, for a detailed account of the history and nature of how the internet has changed mainstream cinema.
81. During, *Modern Enchantments*, 38.
82. *Ibid*.,1.
83. *Ibid*., 39.
84. Adorno, 'Letter to Benjamin, 10 November 1938', in *Theodor W. Adorno and Walter Benjamin: The Complete Correspondence 1928-1940*, 283.
85. Benjamin himself embraced the idea of unmediated presentation. In his never-completed Arcades Project, a sprawling collection of quotations which Benjamin intended as a montage of nineteenth century Paris, he states: "Method of this project: literary montage. I needn't *say* anything. Merely show. I shall purloin no valuables, appropriate no ingenious formulations. But the rags, the refuse – these I will not inventory but allow, in the only way possible, to come into their own: by making use of them." (Benjamin, *The Arcades Project*, [N1a, 8], 460). Emphasis in original.
86. During, *Modern Enchantments*, 2.
87. Gumbrecht, 'Aesthetic Experience in Everyday Worlds', 314.

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About the author

Dana Cooley currently teaches new media at the University of Lethbridge, Alberta, Canada. Her research and creative practice involves a range of concerns which circulate around the key areas of expanded cinema, media archaeology, physical computing, maker culture, memory and space, and interactivity. Projects range widely from academic writing to collaborative and interactive works. Cooley's recent endeavours include an upcoming monograph, *The art of getting lost: Walter Benjamin and an architecture of cinema*. The book explores Benjamin's thoughts on film in the early twentieth century and asks what relevance his constellation of concerns around that technology have for contemporary digital culture.

Section II:
Study

5. Hitchcock, Film Studies, and New Media: The Impact of Technology on the Analysis of Film[1]

David Colangelo

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Abstract
Perceptual shifts related to the technological conditions of film scholarship have shaped the analysis of film. By observing a sampling of Hitchcock scholarship dating back to the 1960s, we can see how technology enables and shapes academic discourse on film. While early work on Hitchcock involved frantic note taking in darkened theatres leading to short, comprehensive reflections, the ability to control the means of projection via technologies such as the VHS allowed scholars to engage in lengthy, visually detailed readings of film structures, as well as close, personal readings of signs and moments. Currently, the digital life of film (and film scholarship) is thriving in its growing affinity with art and information exemplified in works such as Christian Marclay's "The Clock" and Douglas Gordon's "24-Hour Psycho."

Keywords: film scholarship, film analysis, Alfred Hitchcock, VHS, viewing environments, film studies

> The dominating vantage of the critic is merely that privilege he derives from being a spectator who arrives on the scene after the fact, in a new age of knowledge and in the name of greater enlightenment.[2]
>
> – Jean Starobinski

> Man the tool-making animal has long been engaged in extending one or another of his sense organs in such a manner as to disturb all of his other senses and faculties. But having made these experiments, men have consistently omitted to follow them with observation.[3]
>
> – Marshall McLuhan and Eric McLuhan

Perceptual shifts related to the technological conditions of film scholarship have shaped the analysis of film. Using a cross section of scholarship on Hitchcock dating back to the 1960s – as it represents a large, varied, and longitudinal data set – including the work of Robin Wood, Maurice Yacowar, William Rothman, Raymond Bellour, Stanley Cavell, Murray Pomerance, and Joe McElhaney, I demonstrate the ways that the film critic and scholar arrive at their analysis of films amidst new ages of technology – technology that enables and drastically alters the academic discourse on film.

Viewing environments and operations available to film scholars throughout history, starting with the 16mm print, projector, and editing table, and proceeding to the personal VHS, and finally the DVD and the digital film viewed on a networked screen, have changed the practices and products of film scholarship. Early work in the analysis of Hitchcock's films involve frantic note taking in darkened theaters, or, at best, infrequent sessions at an editing table with hard-to-find 16mm prints. This leads to "relatively short reflections" that focus on "themes." In the later writings, however, (such as with Rothman, Bellour, and Pomerance), the ability to isolate and possess frames and moments, that is, the ability to control the means of projection via technologies such as the VHS,[4] open up possibilities for lengthy, visually detailed, close, personal readings of film structures and of signs and moments in Hitchcock's works. The changing material apparatus of film scholarship, in its shift towards personal, fragmented, and controllable modes of reception, can also be seen to influence movements away from the authority of filmic texts towards greater structural and visual analyses, with greater emphasis on personal, institutional, and technological impacts.

What we can do with films, and what scholars can say about (and with) them, continues to change as the cinema migrates to the digital, networked screen. Today, as film 'relocates'[5] to new platforms and new environments,[6] as Francesco Casetti observes, it takes on, among other things, the functional characteristics of computation and facilitates intensely personal visions – it is made increasingly open and available to recombination and refraction by successive technological advancements, lending it new registers of 'expressivity' and 'relationality'.[7] In the case of Hitchcock, the increased ease and availability of reviewing films and capturing clips and stills is exemplified by the '1000 Frames of Hitchcock' website,[8] a site that has subdivided each Hitchcock film into 1000 pre-frozen moments available for viewing and downloading, democratizing and even popularizing, to a degree, detailed visual analyses of his films. More generally, the increased ease of access to 'film' has made academic discourse on film more reliant

on data visualization and the treatment of film as information. At the same time, there have been a growing number of artists working with film, particularly using digital film and digital tools, to simultaneously celebrate and critique Hitchcock, and more generally film and cinema. I suggest that installations such as Douglas Gordon's '24-Hour Psycho', which presents Hitchcock's 1960 film at a glacial pace in a gallery setting, may be indicative and instructive of how film has come to be viewed and used in the age of digital media: in private, mostly, and on computers that allow for the surgical dissection and precise suspension of a traditionally time-based medium.

As a result of technological changes, the digital life of film (and film scholarship) thrives, as D.N. Rodowick notes,[9] in its growing affinity with art and information. Such is certainly the case with recent work on Hitchcock. Examples of digital films as art and information, such as Geoffrey Alan Rhode's '52 Card Psycho'[10] and Christian Marclay's 'The Clock', employ data visualizations, editing tools, and interfaces unique to the current state of film digitization in order to critique and memorialize Hitchcock – and the entire body of film – in an ever evolving drama of knowledge, personal expression, enlightenment, and technology. In doing so, they might suggest a future for the analysis of film, or an alternative to it, that emphasizes the expressive, algorithmic, and relational.

Scribblers in the Dark

> And now, whilst others are sleeping, this man is leaning over his table, his steady gaze on a sheet of paper, exactly the same gaze as he directed just now at the things about him, brandishing his pencil, his pen, his brush, splashing water from the glass up to the ceiling, wiping his pen on his shirt, hurried, vigorous, active, as though he was afraid the images might escape him, quarrelsome though alone, and driving himself relentlessly on.[11] – Charles Baudelaire

The enduring image of Baudelaire's 'The Painter of Modern Life' might very well be this: a man scribbling furiously in a room attempting to capture something eternal from the passage of time made apparent by the rush of the crowd before him. Certainly more than a coincidence, this is not unlike the image of the film scholar of the 1960s attempting to capture the essence of a film from the flickering impressions of the cinema. Compare Baudelaire's description above to what we find in the introduction to

Robin Wood's *Hitchcock's Films Revisited*. Reflecting on his seminal work *Hitchcock's Films*, published 20 years earlier in 1969, Wood writes:

> When I wrote [*Hitchcock's Films*] the technology of film study was still in a fairly primitive stage (as was the critical apparatus): with most of the films I worked from memory, or from notes scribbled in movie theaters during public screenings.[12]

The film scholar of the 1960s, like Baudelaire's painter, spent much of their time scribbling in the dark in order to capture something from their preferred window on the world. Instead of looking through smoky windows – "the principle thoroughfares of the city"[13] as Poe calls them – to grasp something of the crowd outside, the film scholar looked to the illuminated screen as an area of heightened value to record, analyze, and understand something of the world unfolding before their eyes. The technology available to both Baudelaire and Wood, each in their respective epochs, influenced what their objects of inquiry were and what they could do with them.

In the 1960s, when access to a film meant only a few uninterrupted viewings in a darkened theater, note taking was the only memory aid available to the film scholar. At best, a researcher might procure a 16mm print from a library or film institution[14] and gain access to an editing table. The material conditions of the cinema at the time limited a scholar's options for experiencing a film to theaters where the films happened to be showing or to scarce and expensive 16mm prints. As such, viewings were usually infrequent and precious;[15] film was certainly not treated like the ubiquitous and replaceable DVDs and digital files traded and downloaded internationally today. The film as a rare and precious thing had a significant impact on the critical apparatus that emerges from this period of film scholarship.

Early Hitchcock scholarship that derives from the analysis of these relatively scarce 16mm prints tends to exhibit comparatively economical analyses, with a proclivity to highlight literary structures and interpretations of the intentions of the auteur regarding narrative meaning. Although writing later than Wood in 1977, Maurice Yacowar notes in *Hitchcock's British Films* that a great deal of space in his analysis is given over to longer plot summaries to bring his reading audience up to speed with films such as *The Lodger: A Story of the London Fog* (Alfred Hitchcock, 1927)[16] that were difficult to obtain and impossible for many to watch at the time.[17] As part of his research, of which a great deal was conducted in the dark,[18] Yacowar made a pilgrimage to the British Film Institute on his first sabbatical,

booked private screening rooms, and managed to supplement his viewings with a week on a Library of Congress Steenbeck editor.

Restricted access to films in the 1960s contributed to scholarly readings that reflect the linearity of the available modes of reception, thus exemplifying a more traditional literary approach to texts as having a certain authority, with a focus on plot, genre, narrative, and theme. As Yacowar himself notes, "I analyze the way each film works within itself as a drama of themes and devices."[19] Working from a 'text' that cannot be read out of order, and only once or twice at that without the luxury of skipping about the film as we have come to expect, Yacowar's method is understandably literary. This is certainly also compounded by Yacowar's academic training, one steeped in literary traditions as opposed to yet-to-emerge interdisciplinary studies that later extended the discourse of film analysis to include technology and media.[20] Overall, technology that favors coherence and linearity in film projection and traditional academic training in literature both contribute to Yacowar's literary approach to Hitchcock.

Another characteristic of a period of analysis distinguished by an unbroken linearity of film screenings and a relative scarcity of film was the critical focus on the text as holding a kind of essential meaning closely controlled by an auteur. On the first pass in 1969, Wood, also trained in English and Shakespeare, views Hitchcock's films as evidence of Hitchcock's true authorial genius.[21] As he notes in his analysis of *The Birds* (Alfred Hitchcock, 1963), "[w]hat concerns (or should concern) the critic is not what the film should be but what it *is*."[22] Take, for example, his analysis of *Psycho* (Alfred Hitchcock, 1960), again somewhat stingy by today's standards at nine pages. His analysis, working chronologically and briskly, pauses only to highlight and reinforce the brilliance of the thematic material. He ends with the exaltation, "Hitchcock is a much greater artist than he knows."[23] The state of media available to film scholars is reflected in the form and content of analysis. Linear, infrequent passes at film contributed to relatively short pieces of analysis concerned with the authorial text and uncovering themes, narratives, and so-called coherent truths. This effect is compounded by academic traditions yet to incorporate the effects of media and technology into their critical frameworks.

The reflections of both Yacowar and Wood on their original methods in the respective re-releases of their books on Hitchcock point to a growing awareness over time of the technology of film analysis and the shifting ground of analysis due to technology. Reflecting on his methods in the 2010 re-release of *Hitchcock's British Films*, Yacowar states that he was "working on the savage frontier, that is, before the pause button and rewind of the

videocassette."[24] As noted earlier, Wood also refers to this time as a "primitive stage"[25] in both the critical and technical apparatus of film. Yacowar and Wood, like Baudelaire's painter, appear to us to be at the mercy of the pen and paper, prone perhaps – as Wood notes in Hitchcock's *The Lodger: A Story of the London Fog* – to "the injustice of judging by the senses alone."[26]

Written in the late 1970s, Raymond Bellour's essay 'A Bit of History' refers to the technique of taking notes in a darkened theater and argues that there remains an insurmountable and significant gap between the scholar's notes and the film. Like Yacowar and Wood, Bellour admits to "years in the dark [...] trying to capture with a practiced but fatally inept and always insufficient hand"[27] the dialogue, action, shot sequence, and structure of the film, along with their primary relevance. Bellour remembers jotting down "everything [...] filling notebooks to the point of absurdity."[28] For Bellour, the feeling that he had come up empty-handed, that he had missed the essence of the film, was ever-present.

This is what leads Bellour to refer to film as the "unattainable text."[29] Part of what Bellour means by 'unattainable' is that one's reading of a film is highly personal and in many ways inexpressible. Borrowing from Roland Barthes, who shows us in 'The Death of the Author' that there is no single authorial reading to uncover in any text, Bellour reminds us that differential texts are produced in the act of reading. Film is no exception. But, at the same time, Bellour places a great deal of hope in technology, seeing it as a way to get a bit closer to the elusive object and as a means to provide richer, more meaningful analyses of film.[30] With this, Bellour introduces the idea that the viewer's ability to observe and report is tied to their ability to remember and reflect, and this, as Bellour points out, is tied to technology. For Bellour, technology creates a new kind of intimacy with an always-elusive object.

With film scholarship, a shift in the control over the means of projection, as Bellour notes, produces a different kind of proximity with film that changes what scholars do with film in the 60s and 70s. Bellour reflects on what Constance Penley identifies as "a revelatory moment in the late sixties and early seventies when film critics first took the film off the projector and onto the editing table to be able to view it shot by shot, stopping and starting it according to the needs of analysis rather than the rhythms of 'normal' viewing time."[31] The freeze frame, the ability to alter the temporal flow of the film to isolate specific frames and extract them from the film ushered in by the use of editing tables and made ubiquitous with increased access to films, film stills, and the advent of the VHS in the late 1970s, brought about a completely new way of looking at film, one that changed the needs and outcomes of analysis.

The Frozen Frame

> I have seen what happens to film writing when one writes from memory or with the help of a few notes taken in the theatre – when one wants to avoid the very costly, perhaps too costly penalty for freezing the image.[32]
> – Raymond Bellour

> Stills are essential. Indeed they represent an equivalent, arranged each time according to the needs of the reading, to freeze-frames on the editing table, with the absolutely contradictory function of opening up the textuality of the film just at the moment they interrupt its unfolding.[33]
> – Raymond Bellour

A new relationship with film was introduced by a greater focus on the freeze frame and film still.[34] Examples of Hitchcock scholarship throughout the 60s, 70s, and 80s, show that the freeze frame and film still contributed to a shift from a linear, literary approach, to a focus on signs and shots – a shift to the semiotic building blocks of Hitchcock's films. This was accompanied by an increase in visual evidence in Hitchcock scholarship, facilitated by greater access to film and film stills. Yet, amidst these technological developments that allowed for a microscopic dissection of film there was the danger, as Bellour notes, of losing the very essence of cinema: movement. Amongst Hitchcock scholars, Raymond Bellour seems most acutely aware of the tensions between stillness and movement and demonstrates the transformations film scholarship underwent when the film was made susceptible to precise visual dissection via the freeze frame and film still. For example, in contrast to both Wood and Yacowar, Bellour is not interested in digesting entire films. This is partly a consequence of the isolation and presentation of film stills that gives him so much more to look at and write about. His close readings of specific sequences flow from, he says, a "logical accident of a fascination,"[35] a fascination that is born amidst the sense that this fascination might be indulged on the editing table. In this, Bellour avoids narrative analysis and makes few allusions to authorial visions related to theme and character. This speaks to a shift in the kind of analysis that the freeze frame makes possible. The freeze frame allows Bellour to enter into a deep analysis of the structural composition of passages and allows him to communicate this to his audience via an extensive collection of previously unavailable stills.

The freeze frame also serves to atomize the film and allows Bellour to comment on the nature of its construction – to perform a semiotic analysis

of film as opposed to a literary one. Take for example his analysis 'System of a Fragment (on *The Birds*)' from *The Analysis of Film*, originally published in *Cahiers du Cinéma* in 1969. Here, Bellour dispenses with a thematic or narrative approach and instead picks apart a specific sequence frame by frame. The sequence – the scenes that take us across Bodega Bay with Melanie to the Brenner House and back across to meet Mitch (and an angry gull) at the pier – is dissected into the 84 shots of its composition, diagrammed and labelled according to the 'look', 'framing', and 'movement'. The overall effect is to create a kind of score for the visual music that Bellour sees at play in Hitchcock's films. Instead of telling us what the film means, Bellour attempts to tell us *how* it means through meticulously annotated shots. He rounds off this analysis with a lengthy commentary, referencing precise shots and moments. In one particular passage about the Bodega Bay sequence, Bellour explains:

> The central point of [Melanie's] itinerary is the room in the Brenners' house where she intends to deposit the lovebirds. Thus, shots 32-36 (A3) [referencing a series of annotated stills], which show her in the house, constitute the hinge of the sequence. They punctuate Melanie's journey out and back with a resting point; and the action at each end echoes that at the other, reinforcing their median positions.[36]

The meaning that Bellour extracts from this sequence comes from the repeating patterns and rhymes that become visible in the constituent elements of each shot. They are motifs of vision that become apparent only when they have been reduced to annotated moments enabled by the material conditions of analysis he has access to and employs. Bellour shows us how film can be seen to work on us like music or poetry, and can only do so by slowing the film to a speed that allows for its transcription. It is not that these motifs are otherwise invisible; it is that they only become discoverable – they only enter our perception and the episteme of film – alongside a changing technological apparatus of film scholarship. In this way, the material conditions of analysis – the freeze frame and film still in this case – construct, in the access granted by the technology, what we perceive to be the nature of film. Simply put, watching a film once or twice in a theater versus watching it multiple times and pausing whenever one wishes leads one to see, think, and speak about a film in completely different ways.

Take, as another example, William Rothman's *Hitchcock – The Murderous Gaze*, published in 1982. Rothman's analysis, which includes hundreds of

film stills carefully extracted from the 16mm prints he was working with,[37] highlights the technical mechanics of film as essential to its construction. These mechanics are observable to Rothman only through the expanded means of viewing film that he engages with. His analysis, particularly his work on *Psycho*, seems to be guided first and foremost by the movement of the camera. Instead of seeing the film as a literary text produced by an auteur that masterfully weaves together plot, theme, and character, as Yacowar and Wood do, Rothman sees it as a *film* comprised of evocative sequences of camera movements controlled by an artist of the medium. On *Psycho*, Rothman illustrates this perspective in a number of ways, stating that "the camera's opening gesture is posited as enigmatic," that "the camera descends to earth," and that, "[a]s the film opens, the camera appears spontaneous, unselfconscious, free."[38] In the end, just under 100 pages later – a significant shift from Wood's ten-page analysis of the same film – Rothman notes that "[a]t one level, *Psycho* is an allegory about the camera's natural appetite."[39] Like Bellour, Rothman's technical apparatus allows him to view the film as if under a microscope and to digest it one visual morsel at a time. As such, Rothman is able to discover an aspect of the film's construction, the specific movements and placement of the camera, and uses this as the basis for his analysis of the film and of Hitchcock.

That said, there are challenges created in working from what is seen frame-by-frame. Careful visual analysis certainly contributes to the lengthy page counts of Bellour and Rothman. To speak for (and to) pictures is something that seems to both confound and compel Bellour and Rothman. Each frame, it appears, contains the potential for an inexhaustible ekphrasis. Wood and Yacowar, on the other hand, working within the familiar literary boundaries of narrative, plot, and theme in the presentation of their analysis, can maintain a relative economy in their work.

Of course, shifts in technology that engender visual approaches used by Bellour and Rothman do not make previous literary approaches obsolete. It is important to note that experiments and shifts in the analysis of film can and do employ mixed modes of analysis. Take, for example, Stanley Cavell's essay on *North by Northwest* (Alfred Hitchcock, 1959). This piece, first published in 1981, mixes literary and technological perspectives. With an eye on the technology of film, Cavell names Rothman's work as an inspiration, taking from him a sense of the "murderous gaze" emanating from Hitchcock's camera that interrogates its human subjects and, as Cavell says, "inevitably proceeds by severing things, both in cutting and, originally, in framing."[40] While interpreting and analyzing Hitchcock by way of watching what he does with his camera, Cavell also keenly searches for

literary connections and explanations. A full half of the essay[41] is dedicated to making connections between *North by Northwest* and Shakespeare's *Hamlet*.[42] Enabled by an attention to visual detail occasioned by the freeze frame and the film still, Cavell's mixture of comparative literature and an analysis of the grammar of film deftly expands an appreciation and critique of Hitchcock beyond literary merits, but not apart from them.

Beyond Grammar and Structure: Moments Reviewed and Relived

> In the moment that we experience it, cinema is pre-grammatical, specifically in the sense that grammar is the organizing principle of scripture even though there is a 'grammar' of images. For the purposes of analysis, exchange, and reference – all of these being beyond experience – it is convenient, perhaps, to think of a film in terms of scenes, sequences, and shots – the elements of 'film grammar' – an approach that does consistently show the merit of revealing the constructive principles of film by foregrounding them. [...] But at the moment when we are caught up in our actual gaze at the screen – with our disbelief suspended, as it were – none of this matters, or seems evident, or is visible.[43] – Murray Pomerance

In his 1985 article 'Analysis in Flames', Bellour notes that as much as the freeze frame and the VHS freed the film scholar to delve into the visual language of the film, the VHS, the "ideal instrument for analysis," "killed" the analysis of film.[44] By this, Bellour does not mean that film analysis ends with the VHS. He means that film analysis, once based on treating the film as an entity to be viewed and written about as a whole, is forever altered by the pause, fast forward, rewind, and stop functions engendered by the VHS. What is most useful about Bellour's proclamation – and we might also add here Rothman's regard for Hitchcock's camerawork – is the attention that it draws to the impact of technology on film scholarship. The most important message we receive from Bellour and Rothman is that film analysis cannot continue without a consideration of film's technology – lenses, cameras, lights, etc. – or without considering how technology enables and encourages certain modes of analysis.

That said, and as Pomerance notes above, film analysis can get bogged down in technical details when it becomes too focussed on structure and constructive principles, and can miss something essential about the experience of film in the process. Instead of taking a step back, Pomerance, in

An Eye For Hitchcock, published in 2004, suggests that we get up close and *personal* with film as an antidote to dispassionate, structural analyses. While remaining highly visual, Pomerance's analysis specifically avoids referencing individual frames (and subsequently using them as evidence) and instead looks to expand upon signs, moments, and sequences that have both moved and perplexed him. The kind of analysis we find in Pomerance's work is related to a mode of interacting with films in private, personal settings on television sets and computer screens. Starting with VHS and proceeding through DVD to films on demand (or download) to computers or mobile devices, various technological advances in film and screen-based media have allowed a greater control and proximity to the film in a personal and private setting for viewers and scholars alike. In Pomerance's analysis of Hitchcock's films, this contributes to an intensified focus on the visual and the personal.

In *An Eye For Hitchcock* and *The Horse Who Drank the Sky*, both published in the last ten years, Pomerance offers a clear example of the kind of intimacy that the remote control and the computer interface allow with what we might now call the digital life of film. Although he does not explicitly outline his viewing methods, his stated methods of turning and returning to filmic moments evoke a relationship with an apparatus that allows for easy and precise access. Still, Pomerance does explicitly reveal the following about his work:

> I took as a model Truffaut's reminiscences of watching the 'Good Mornin'!' routine from *Singin' in the Rain* over and over on a Moviola until he had seen the finest nuance of a gesture Debbie Reynolds executed at one moment in history to cause her skirt, in mid-step, to cover a naked knee. This kind of discreet moment is the stuff of film. To stand back oblivious, to run over it by trying to follow the story, to glide past it in order to see yet another and still another film, are all ways of being blinded.[45]

Just as Truffaut did with *Singin' in the Rain* (Stanley Donen and Gene Kelly, 1952), the digital reincarnation of Hitchcock's films allows many more of us to inhabit and bathe in key frames and moments. In taking multiple, intense, close looks at Hitchcock, what Pomerance catches, and what he implores us to be aware of, is the "small stuff",[46] stuff that he believes scholars and fans may be missing. He entreats us to go back and take a closer look. But of course, only with the DVD loaded up or the file at our command can we truly entertain Pomerance's suggestion in this day and age; only with digital files might we get to this level of detail. The good news is that scholars and non-scholars alike have the means to make good on his suggestion.

Pomerance shows us how technical memory devices can help to shape the memory and experience of the film scholar. Given the apparatus that Pomerance uses to view and review Hitchcock, it is not surprising that he describes a closer connection between how he conceives of his memory and how he interacts with film. As he notes, "[o]ften, instead of following the story in a linear fashion, I leap across moments, rather in the way that memory does when we recollect films and try to map them against our experience."[47] Pomerance's recollection, perhaps a kind of post-modern recollection that prefers a highly personal genealogy to a defined history, finds its match in the technical apparatus at hand. While Hitchcock's films may have been encoded to be experienced from front to back, they are, as Pomerance argues, often remembered in disordered fragments connected by individual recollection. Similarly, Martin Lefebvre the relationship between artefact and spectator in his work on *Psycho,* recalling Malraux's concept of the 'imaginary museum', that is, the idea that multiple images present us with an excess of references that we personally remember and order so that, in the case of a film, we might 'read' it in our own way against itself as well as against other films, or what Lefebvre calls film culture.[48] This mixed temporality, relationality, and personalization of the experience of film is one that is facilitated, constructed, and extended by the changing technical apparatus of film scholarship. A blended sense of time, texts, and memory is one that we can imagine more fully, one that is made more real, by the compulsive repetition and fragmentation facilitated by the digital technologies and files at hand. Pomerance's concept of film experience, a highly personal recombination of film moments within and across films mixed with our own personal experience, can be seen to emerge alongside the digital technology we now use to watch and analyze film.

Writing on the changing materiality and interface of film in *Death 24 X A Second*, Laura Mulvey notes that, "[w]ith electronic or digital viewing, the nature of cinematic repetition compulsion changes."[49] The technology available to film scholars and film viewers today invites the pausing, reviewing, annotating, and delaying of film at any moment and caters to the splitting of film into segments that can be displayed in books and seminars, and shared on various surfaces with the aid of today's ubiquitous data projectors and network enabled screens. The use of the *Lignes de temps* software by the *Institut de recherche et d'innovation/Centre Pompidou* in 2010, an educational tool aimed at facilitating the annotation and comparison of frames and sequences of films, provides another example of this – students were asked to use *Lignes de temps* ('timelines' in English) to analyze Hitchcock's *North by Northwest*.[50] Thus, with the film "fragmented from linear narrative into

favourite moments or scenes," the spectator, student, and scholar alike are able to "hold on to, to possess, the previously elusive image."[51] Other outgrowths of this new operability on film include the production and circulation of online works such as YouTube 'supercuts' that, for example, might present every significant death scene from every Hitchcock film arranged and synchronized within a single multi-frame clip,[52] or every Hitchcock cameo in chronological order.[53] Pomerance's deeply personal and precise recollections speak to this shift to constructing, possessing, and enriching these moments through repetition and close attention. The technology of film today indulges and amplifies personal reflections and compulsions as it relocates films to places and spaces where we can explore its relationality to itself and to ourselves, and at the same time explore its expressivity through ourselves and through digital tools. As Casetti notes, it institutes a kind of filmic experience that "boasts liberatory values rather than the celebration of a discipline's glory."[54] That this becomes apparent alongside assemblages that allow for a highly personal and controllable "means of projection"[55] is a consequence, not a coincidence. This mixture of fragmented precision and intimacy comes with being able to manipulate the things that give us visual pleasure wherever and whenever we want.

Hitchcock's Digital Afterlife: Art and Information

What other transformations might we see in the analysis of films as films themselves continue to be digitized, stored, searched, pinched, clicked, stretched, sped up, slowed down, cut, mixed, shared, and recombined? What happens when we can produce reflections on film not only through textual analysis supplemented by photographs of films, but through actual combinations and transformations of the body of film now available to us in digital formats?

D.N. Rodowick has written about the impact digital conversion, production, and access have had on film studies. Rodowick notes that digital screens "give us image as illusory space and image as instrument for action."[56] In other words, by virtue of interactive interfaces (e.g. DVD software, QuickTime, Final Cut, YouTube, *Lignes de temps*) digital images represent to us the potential for action upon them. As such, digital artefacts are particularly precarious, mutable, and open to recombination and intervention when surrounded by software controls and susceptible to various algorithms and commands. Mediated by interfaces, the digital film, much more than its celluloid predecessor, asks to be controlled, managed, and used as material for re-composition.

The digital film image, beyond the impact of the freeze frame and film still, changes how we see and use film. Instead of an image that can only be watched, scrutinized, or observed, digital film provides material that can be modified, managed, and exhibited by a kind of networked observer-participant. As "the image is treated more and more as information to be accumulated, stored, sorted, and analyzed,"[57] we get further away from the idea of a delimited text within an objective history. This is something that started with the freeze frame but has intensified with digital film.

In light of this shift, it is important to considerk what we might ask of this "new age of knowledge [...] in the name of greater enlightenment,"[58] brought about by the digitization of film. For Rodowick, the most important functions for film in a digital era are as information and as art.[59] To understand film as art, consider first Douglas Gordon's '24 Hour Psycho', an installation that involved stretching a single screening of Hitchcock's *Psycho* over twenty-four hours. Gordon notes that '24 Hour Psycho' comes out of wanting to show his experiences of viewing *Psycho* in a private setting, a mode of reception that allowed him to slow the film down so he might compulsively analyze particular moments.[60] In this way, Gordon shows us something about how film is used and can now be seen by general audiences and critics alike, and how it changes what we get out of it as a result. Reduced almost to a sequence of stills, viewers can begin to see what critics and scholars are finding when they are slowly and repeatedly reviewing moments or stills. Viewing *Psycho* in this way strips the film of its ability to communicate character, plot, theme, and narrative as Hitchcock intended, and foregrounds for the viewer the very aspects of the film that have become observable to the scholars and artists working with a slowed down, controllable film text: camera movement, shot composition, and personal reflection. Similar to the writing of Rothman, Bellour, Cavell, Casetti, and Pomerance, Gordon can be seen to show us how the changing material conditions of film shift the focus of both the critical and pleasure seeking eye.

As Rodowick points out, film as art and new media "challenges film studies and film theory to reinvent themselves, to reassess and construct anew their concepts."[61] As the preceding appraisal of '24 Hour Psycho' suggests, this might even mean a reconsideration of the vehicles whereby questions of film are asked and presented. Bellour, who was one of the first voices from within film scholarship to call for the analysis of film beyond print,[62] notes that the dispositif of the gallery itself is important to the use of film within it: it is a critical, discursive space, and thus prefigures our relationship to what is presented there in a way that is distinct from our

engagement with the written word, the printed photograph, or the film projected in a theater.[63] Unlike the theater, the book, or even the computer screen, the gallery can provide a space to ask questions of film *with film*, presenting us with a particularly productive 'relocation' of film.

This is not to say that probing film with film is a new phenomenon. In fact, Hitchcock himself can be seen as an artist who was able to create rich narrative spaces while remaining conscious and critical of the construction of film. This, in many ways, is the point that Rothman makes by highlighting Hitchcock's ability to understand and express the power of the camera in his films. Joe McElhaney,[64] in his essay on *Marnie* (Alfred Hitchcock, 1964) in *The Death of Classical Cinema*, similarly foregrounds the artistic expressivity alongside the medium-specific critique in Hitchcock's work. Although a product of the Hollywood studio system, McElhaney argues that Hitchcock can be seen to have a great deal in common with alternative art cinema and the modernist filmmaking of artists such as Antonioni and Resnais that critically appraise the medium from within. In *Marnie*, McElhaney sees Hitchcock as grappling with the tensions between his interest in modernist cinema and the expectations of Hollywood. The result, according to McElhaney, is a beautifully broken film that compels the audience to see it "as a film of pieces,"[65] delightful in its instability. Interestingly, as McElhaney notes, "What is 'in pieces' in *Marnie* is not simply this film alone but virtually all Hitchcock's cinema, which *Marnie* exhaustively calls on in its attempt to create a new kind of Hitchcock film."[66] What McElhaney and Rothman allow us to see operating in the existing, unadulterated Hitchcock, is an artist conscious and expressive of the vicissitudes of his craft and medium and, perhaps most interestingly in light of digital automatisms available to us today, willing to embrace fragmentation, excess, and imperfection as a position from which to create anew.

Taken literally, it is from these fragments of film – the clips available today with film editing software or ready-made online – that contemporary artists are attempting to reinvent film and film studies. In doing so, many are treating film algorithmically, or, returning to Rodowick's second foreseeable role for film in the digital age: as information. One such work that illustrates this shift is Christian Marclay's 'The Clock' (2011), a 24-hour montage of clips sampled from several decades of cinema. Every clip, painstakingly selected by Marclay, depicts a specific time of day referenced explicitly within a film that matches the actual time during its day-long exhibition. For example, at 1:45 p.m., one would see a clip from Alfred Hitchcock's *Sabotage* (1936): a black-and-white shot of a clock ticking towards 1:45 p.m. followed by a package exploding on a double-decker bus in London. Marclay's 'The Clock',

just barely possible given today's digital tools,[67] treats the entire body of film as a kind of database – as information – to be searched through as if by computer algorithm. As Zadie Smith notes in her piece on 'The Clock' in *The New York Review of Books*:

> Marclay has made, in essence, a sort of homemade Web engine that collates and cross-references an extraordinary amount of different kinds of information: scenes that have clocks, scenes with clocks in classrooms, with clocks in bars, Johnny Depp films with clocks, women with clocks, children with clocks, clocks on planes, and so on, and so on, and so on.[68]

By treating film as information, applying an algorithm, and digitally displaying the results in the gallery, 'The Clock', and other works like it,[69] challenge the printed page's primacy in recording or expressing what is seen and felt when we think about our relationship with film. In a way, 'The Clock' asks an epistemological question about how we come to know film – and ourselves – through film. Perhaps bits of carefully selected film clips painstakingly spliced together with the generous support of visualization software approaches a better approximation of our memory and experience of film today than a written investigation into plot, theme, and character. Clocks, a sign of time – and as 'The Clock' points out, a sign of our times – might find their deepest and most engaging analysis for us today with the aid of an algorithmic inquiry into the body of film and its digital recombination and display in the gallery.

Art and information, the two functions that Rodowick sees for the digital life of film, appear to coalesce in a recent work by G. A. Rhodes at York University's Augmented Reality Lab entitled '52 Card Psycho'.[70] With '52 Card Psycho', 52 individual playing cards are imprinted with unique markers that are tracked by a digital camera. The camera passes this information on to a computer that matches the cards with individuated shots from *Psycho*'s shower scene and overlays a video feed of the cards with these scenes on a separate screen. On the website, Rhodes describes his project as:

> an installation-based investigation into cinematic structures and interactive cinema viewership [...] The cards can be stacked, dealt, arranged in their original order or re-composed in different configurations, creating spreads of time [...] The medium of the animated image, in its wedding with the real world, loses the privileged linearity of the screen, and gives the opportunity to re-perceive cinema as the juxtaposition of its parts.[71]

'52 Card Psycho' shows us how we can now do far more than look at and write about film. We can interact with film via interfaces that enable new relationships via data-rich interfaces and environments. In this respect, '52 Card Psycho' illustrates what Rodowick means when he says "cinema has become more like language than image, with discrete and definable minimal units (pixels) open to transformations of value and syntactic recombination"[72] – cinema becomes an image-based language open to the relationality and expressivity we have come to expect of language. We find ourselves, once again, learning this new language with its new challenges and new outcomes for material, new and old.

Of course, some might see these experiments and expressions as a denigration of the body of film – as Hitchcock, and the rest of his colleagues, hacked to bits by a shadowy, murderous force. Instead, I would argue that we should see this as a 'revelatory moment',[73] similar to the moment when film scholarship began to embrace the editing table and the freeze frame that accompanied it. The digital life of film reminds us that there is so much more to be discovered in film, and so much more to learn about ourselves, and about the tools that we create and use to aid memory and analyses. Having extended our senses once again, we should not, as Marshall and Eric McLuhan warn, omit to follow these experiments with observation. In our ability to alter, recombine, search, and find patterns in film with the aid of computers, we might gain a greater appreciation for Hitchcock, the construction of film, and the experience of film. The ideal spectator, or the ideal film scholar for that matter (if such a term still applies), may no longer be one who sits in a movie theater with a notepad, or even in a living room with a stack of DVDs and a laptop, but one who actively interacts with the body of film as information and as art.

The trajectory of film technologies has taken film analyses from linear, literary analyses where films are presented as coherent texts to non-linear, highly personal and/or algorithmic analyses of a body of film opened up to recombination and annotation. This leaves us with some questions. Does this democratize or popularize film analysis? Does it make film analysis more accessible? With filmic texts and tools for analysis readily available, as well as a means to propagate them at hand with various digital distribution networks, the answer would appear to be yes. That said, the 'analyses' presented in works of film as information and art such as 'The Clock' and '52 Card Psycho' provide a productive relocation of film in both setting and format that goes well beyond the means of the amateur enthusiast. Perhaps, in order to remain relevant, the film scholar must, like Rhodes and Marclay, become a media artist as well, signaling the next frontier for film analysis through customized

interfaces that provide novel perspectives of form and content. They must do something that the audience does not and cannot do themselves, while making their analysis accessible to said audience in some way. The scholar, once dedicated to tracking down archival reels and editing tables instead might create algorithms and interfaces that produce new observations of film to justify their position. Alternatively, the film scholar may have to become a media scholar, interpreting and analyzing film in its specific transformations and relocations by way of our ever-evolving tools and techniques.

Notes

1. Special thanks to Murray Pomerance for giving me an eye for Hitchcock.
2. Starobinski, *The Living Eye*, viii, quoted in Murray Pomerance, *An Eye for Hitchcock* (London: Rutgers University Press, 2004), 13.
3. McLuhan and McLuhan, *Laws of Media*, 93.
4. Bellour, *The Analysis of Film*, 2.
5. Casetti, 'Filmic Experience', 63.
6. "What consequently emerge are, on the one hand, new forms of access to filmic experience and, on the other, new surroundings in which this experience might take place." Filmic Experience, 62.
7. Filmic Experience, 63.
8. '1000 Frames of Hitchcock', http://www.hitchcockwiki.com/wiki/1000_Frames_of_Hitchcock.
9. Rodowick, *The Virtual Life of Film*, 154.
10. Geoffrey Alan Rhodes, '52 Card Psycho', http://52cardpsycho.com/52CardPsycho.html.
11. Baudelaire, 'The Painter of Modern Life', 410.
12. Wood, *Hitchcock's Films Revisited*, 1.
13. Poe, 'The Man of the Crowd', 229.
14. Eve Goldin, Librarian, Film Reference Library/Cinémathèque Ontario, personal interview, Toronto, Ontario, July 2011.
15. In the acknowledgments of *Hitchcock's Films*, Wood thanks the National Film Archive in England for allowing him to see "certain films otherwise unavailable." See Wood, *Hitchcock's Films*, 7.
16. Yacowar, *Hitchcock's British Films*, 18.
17. Many of Hitchcock's British films are available on YouTube. For example, see 'Rich and Strange (1931)', YouTube, http://www.youtube.com/watch?v=aA0KjVG2fec..
18. Yacowar also later reports that his "writing was necessarily based on a single viewing and – usually – the foolhardy diligence of note taking in the dark" (see Yacowar, *Hitchcock's British Films*, xii).
19. Yacowar, *Hitchcock's British Films*, 7.

20. Yacowar majored in English, producing a Master's dissertation on The Earl of Rochester, a seventeenth-century poet, and completing a PhD at The Shakespeare Institute at the University of Birmingham (see 'Maurice Yacowar | Department of English', University of Calgary, http://english.ucalgary.ca/engl/MauriceYacowar.
21. Wood received his training in English at Cambridge and was inspired by the Shakespearean scholar AP Rossiter (see Charles Barr, 'Robin Wood obituary', *The Guardian*, 4 January, 2010, http://www.guardian.co.uk/theguardian/2010/jan/04/robin-wood-obituary). Granted, in the first lines of *Hitchcock's Films*, Wood promises a move away from a literary analysis to a visual analysis that "grasps the nature of the medium" (see Wood, *Hitchcock's Films*, 7). Upon reviewing his work in comparison to some of the work that follows (see Bellour, *The Analysis of Film*, and Rothman, *Hitchcock – The Murderous Gaze*) it can be seen to maintain traditional literary concerns.
22. Wood, *Hitchcock's Films*, 32.
23. Ibid., 123.
24. Yacowar, *Hitchcock's British Films*, xii.
25. Wood, *Hitchcock's Films Revisited*, 1.
26. Wood, *Hitchcock's Films*, 21.
27. Bellour, *The Analysis of Film*, 2.
28. Ibid., 3.
29. Ibid., 21.
30. Hitchcock is particularly deft at showing how technology contributes to the mediation of proximity. In an amusing and illustrative passage from *North By Northwest* (Alfred Hitchcock, 1959), Roger O. Thornhill (Cary Grant) looks through a telescopic lens to get a closer look at the faces on Mt. Rushmore. This lens system, a vision system with Galilean roots, extends the eye in order to construct a closeness with distant objects, the same way that the camera, the lens systems and machine vision that Hitchcock employs, takes (and makes) scholars and audiences closer to Grant's familiar and adorable mug.
31. Bellour, *The Analysis of Film*, xii.
32. Ibid., 5.
33. Ibid., 26.
34. William Rothman explains the process, arduous by today's standards, of obtaining stills from film: "I used a 35mm SLR still camera mounted on a Steenbeck editing table and simply photographed each frame as it appeared on the screen. Since the images in the book are rather small, in most cases they turned out reasonably well. Because the 16mm prints were in decent shape but had their share of scratches, I had to find, for each still, a frame that was relatively free of scratches. Also, Stennbeck screens tended to have hot spots in the center of the image, so I also had to find, for each still, a frame in which the hot spot was not too noticeable. If I remember correctly, it took me a grueling day for each film to take all the shots I needed" (William Rothman, e-mail message to author, 15 July, 2011).

35. Bellour, *The Analysis of Film*, 29.
36. Ibid., 50.
37. William Rothman, e-mail message to author, 15 July, 2011.
38. Rothman, *Hitchcock: The Murderous Gaze*, 253.
39. Ibid., 255.
40. Cavell, *Themes Out of School,* 166.
41. At 20 pages, Cavell's analysis is slightly longer than the early work of Yacowar and Wood but shorter than Bellour's analysis of the same film.
42. Here is one of a number of fascinating connections between the plot, narrative, and themes of *North by Northwest* and *Hamlet* that Cavell points out: "Thornhill's identifying 'rot' as his trademark by now irresistibly suggests to me Hamlet's sense of something rotten" (see Cavell, *Themes Out of School,* 158).
43. Pomerance, *The Horse Who Drank the Sky,* 4-5.
44. Bellour, 'Analysis in Flames', 54.
45. Pomerance, *An Eye for Hitchcock,* 13.
46. Ibid., 5.
47. Ibid., 4.
48. Lefebvre, *Psycho: De la Figure au Musée Imaginaire.*
49. Mulvey, *Death 24 X a Second*, 161.
50. See 'Using Lignes de temps', Institut de recherche et d'innovation/Centre Pompidou, http://www.iri.centrepompidou.fr/ateliers/pedagogie/using-lignes-de-temps/.
51. Mulvey, *Death 24 X a Second*, 161.
52. See Charlie Lyne, 'Death/Hitchcock', YouTube, http://www.youtube.com/watch?v=E9mMm2Z3SLo&feature=player_embedded.
53. See Will Erickson, 'Every Hitchcock Cameo Ever', YouTube, https://www.youtube.com/watch?v=0kLiLsncyi0.
54. Casetti, 'Filmic Experience', 64.
55. Bellour, *The Analysis of Film*, 2.
56. Rodowick, *The Virtual Life of Film,* 154.
57. Ibid., 147.
58. Starobinski, *The Living Eye*, 13.
59. Rodowick, *The Virtual Life of Film*, 143.
60. VBS.TV, 'Douglas Gordon | Art Talk | VICE', VICE, http://www.vbs.tv/en-ca/watch/art-talk/douglas-gordon.
61. Rodowick, 'Dr. Strange Media', 1403.
62. Bellour says, "However detailed and complete it may be, and even if it says more, much more, than the film ever appeared to say, the written text can never capture anything but a kind of elementary skeleton, stripped of flesh from the beginning" (see Bellour, *The Analysis of Film*, 16). Bellour calls for new creative strategies that might open up the illusory science of film analysis "to a wider world of images and to relations between and among images and texts" (see Bellour, *The Analysis of Film*, xii).

63. 'Film Studies for Free: Film Theory Unstilled: Raymond Bellour', http://filmstudiesforfree.blogspot.com/2009/10/film-theory-unstilled-raymond-bellour.html, 10 October, 2009.
64. Mixing modes of analysis, McElhaney's work combines a keen eye for visual detail with a comparative approach and a more literary concern for genre (see McElhaney, *The Death of Classical Cinema*).
65. McElhaney, *The Death of Classical Cinema,* 91.
66. Ibid.
67. Marclay spent so much time making 'The Clock' that his fingers became calloused from editing (see 'Slave to rhythm: Christian Marclay on Deadline', *The Economist*, 25 August, 2010).
68. Zadie, Smith, 'Killing Orson Welles at Midnight', *The New York Review of Books*, 28 April, 2011.
69. For other examples see Candice Breitz, 'Him + Her', http://www.candicebreitz.net/ and, again, Charlie Lyne, 'Death/Hitchcock', YouTube, http://www.youtube.com/watch?v=E9mMm2Z3SL0&feature=player_embedded.
70. Geoffrey Alan Rhodes, '52 Card Psycho', http://52cardpsycho.com/52CardPsycho.html.
71. '52 Card Psycho'.
72. Rodowick, *The Virtual Life of Film*, 166.
73. Bellour, *The Analysis of Film*, xii.

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About the author

David Colangelo is Assistant Professor of Film Studies at Portland State University and Director, North America, of the Media Architecture Institute. His writing, research, and practice focuses on massive media (urban screens, media architecture, and public projection) as a means to support critical and creative engagements with the city, the moving image, public art, and information. Colangelo's writing has appeared in Public Art Dialogue and The Journal of Curatorial Studies. His work as a media artist has been presented at the International Symposium for Electronic Art (Istanbul 2011, Sydney 2013, Vancouver 2015), the Media Architecture Biennale (Aarhus 2014, Sydney 2016), the Biennale of Architecture and Urbanism in Shenzhen/Hong Kong (2013-14), and in the Leonardo Electronic Almanac.

6. Film Analysis and Statistics: A Field Report

Charles O'Brien

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Abstract
This chapter examines the use of statistics in film analysis in light of possibilities and challenges stemming from online digital tools such as the *Cinemetrics* interface. First, digital resources for statistical analysis are briefly situated in the history of quantitative film analysis. Second, various points regarding the statistical study of film style are illustrated through examples drawn from research conducted by myself and others into the transition from silent to sound cinema, with a focus on issues raised in a recent debate on the fundamental question of how to measure the average shot length in films. Concluding the chapter is a discussion of the role of dialogue in sound films versus silent, which illustrates the advantages of employing different methods of computing average shot length comparatively.

Keywords: cinemetrics, digital tools, statistical analysis, sound cinema, shot length

The Digital Moment in the Analysis of Film Style

The quantitative analysis of film style has a history that long precedes the availability of the digital resources now being employed for film study. The logistics of film production invite numerical assessment, and as a consequence, quantitative analysis, in one form or another, has had a long history in filmmaking practice. Early examples include the efforts of Charles Pathé, the industrialist behind the Pathé-Frères media empire, who ordered the compilation of detailed figures on the lengths of the company's films.[1] The need to tabulate film length became routine by 1910, when laws such as the Payne-Aldrich Tariff, passed in the United States in 1909, charged duties for

imported films based on the length of the footage rather than the weight of the celluloid.[2] At around the same time, as films became longer and came to exhibit a wider variety of techniques of editing and shot composition, more fine-grained statistical analyses were practiced. Filmmakers began counting shots (ordinarily referred to as 'scenes', 'views', or 'tableaux'), frames, and words in intertitles, and computing the averages, as did critics. Among the latter was the 'Rev. Dr. Stockton' discussed in a 1912 issue of *Moving Pictures World*, whose tools for comparing the average lengths of shots in a sample of 25 contemporary films included "a stop watch, a pocket counting machine, and electric flash lamp and a note book."[3] Such rudimentary forms of average shot length computation have been practiced ever since.

A major leap forward occurred in the early 1980s when computer-based methods for average shot length computation were introduced into film scholarship by Barry Salt, whose path-breaking book *Film Style and Technology* appeared in 1983.[4] The book drew upon Salt's statistical examination of shot lengths and framings for thousands of films, which encompassed a broad swath of American and European cinema from the late nineteenth century up through time of the book's publication. Salt's book came at a time when film study was undergoing rapid expansion as an academic discipline in North America and Europe, and it remains an indispensable work of reference for investigations into the history of film style.[5] But with respect to the use of statistics as a film-analytical method, relatively few film scholars followed Salt's example, perhaps because film academics are typically trained in humanities disciplines where statistical research is rarely practiced.

In recent years initiatives connected with the 'digital humanities' have made statistical inquiry somewhat more prominent in film scholarship. The essential development was the inauguration in 2006 of the cinemetrics website, designed by Gunars Civjans and Yuri Tsivian, which provides an easy-to-use interface for recording data, a database where the data is processed and displayed visually, and a forum where research results and theoretical questions are discussed and debated. Further developments include the Shot Logger technology designed by Jeremy Butler and the Lignes de temps system linked to the Pompidou Centre in Paris.[6] The new tools and resources are enabling the generation of a wide variety of statistical calculations, including many that had been too difficult, time-consuming, and mathematically esoteric for film critics in the past to have produced. The public accessibility of the online data is allowing for the cross-checking and confirmation of results, as well as the fashioning of statistics-based arguments by critics other than those who had counted the shots. The ready availability to anyone with internet access of a vast and ever-growing body

of research data has brought about a notable increase in the number of scholars involved in the statistical study of film style. Moreover, in addition to the film scholars who come to cinemetrics without statistical backgrounds, participants now also include trained statisticians. The expanded participation has enabled unprecedented discussion and debate concerning methodological issues. How exactly might the new tools and ever-expanding database of results be employed in film study? What are the limitations and possibilities of statistical methods for film studies research?

Strengths and Limitations

It must be acknowledged at the outset that the utility of statistics for film analysis is extremely limited in certain respects. Statistical computations such as average shot lengths reveal aspects of a film's formal structure at a very high level of abstraction. In film analysis as in other contexts, the meaning of a statistical measurement is never self-evident but requires contextualization and interpretation, so that the statistical study of film style inevitably extends beyond the realm of the statistics per se and into questions of film-historical context. The methodological upshot for cinema study is that statistical techniques can at most supplement rather than replace conventional research practices. Statistical methods amount to an extra set of tools to be used in conjunction with other critical methods, including old-school practices of mindful film viewing and the examination of non-filmic documentation.

Insofar as non-statistical methods remain integral to the research project, then statistical techniques, in my understanding, can offer to film-historical study two distinct benefits. The first benefit is the increased precision that statistics bring to the study of film style. Virtually any film-style parameter can be related to editing, and editing lends itself to quantitative analysis, with the result that critics – for over one hundred years at least – have found irresistible the endeavor of counting shots and computing averages. Questions of norms are always in play in a stylistic analysis, and in this context statistics are invaluable. As music theorist Leonard Meyer observed, the statistical analysis of artistic style can be seen as inescapable because "all classification and all generalization about stylistic traits are based on some element of relative frequency."[7] Meyer was referring to the study of music but the specification of the aesthetic norms operative in particular times and places is just as necessary for cinema study. Even if the principal object of analysis is a single film, the analysis will involve some consideration of how that film conforms to the norms

manifest in a larger body of work. Statistics allow for exceptional detail in the identification of film-stylistic norms.

Statistics can also offer to film analysis a more fundamental benefit. Numerical data enable visual displays such as graphs, which have a way of casting new light on the object of study, bringing out important aspects of films, or bodies of films, that ordinarily go unnoticed. In drawing attention to otherwise invisible style patterns, statistical findings can stimulate the formation of new research questions.[8] Here the major limitation of statistical methods for the study of film style – their indifference to the viewer's experience of a film – can become a powerful advantage. In revealing aspects of a film's construction that escape the viewer's awareness, statistical findings can alter one's sense of how a film is constructed, and this alone can provide a powerful stimulus for rethinking a film or body of films.

My Research as an Example

As a modest example of this sort of revelatory effect, I offer my experience conducting research into musical films of the early 1930s, which informs a book whose manuscript I am currently finishing. The project began with the compilation of data on three shot types I had devised for feature films made during 1927-1934: shots with synchronous speech, hereafter designated as 'dialogue shots'; shots featuring singing performances, or 'singing shots'; and, finally, 'action shots', which range from panoramic landscapes to people walking through doorways, trains arriving at stations, and inserts of clocks and signage, include essentially any shot *not* involving synchronous vocals.[9]

I settled on the three types after having counted shots for dozens of sound films and experimenting with different shot labels and criteria of category membership. The experiments led to the choice of the categories of action, dialogue, and singing as the principal metric for three reasons. First, these categories were consonant with the editing practices I was seeing in cinema in the late 1920s/early 1930s, when shots with synchronous vocals, in almost all cases, run relatively long. The decision to distinguish between action shots and vocal shots responded to the particularities of the films I am investigating.

Second, these shot categories imply particular production methods that can be expected to have entered the awareness of the filmmakers, which allows for the possibility that changes in style can be correlated with changes in film technology and technique. Most fundamentally, while action shots in sound movies were often shot 'wild', as in the silent period, and then the sound added in during the post-production phase, dialogue and singing

shots typically involved 'direct sound', or the concurrent recording of the voices and the image of the actors, which entailed particular aesthetic, technical, and economic constraints. The latter were most formidable for the singing shots, which in the early 1930s ordinarily involved the presence of an orchestra on the set. In sum, the categories of action, dialogue, and singing gave my analysis a forensic dimension, allowing not only for the description of film style but for the drawing of inferences regarding the style's causes.

The third basis for choosing the three shot categories is that they turned out to be relatively easy to distinguish by myself and also by other scholars. To ascertain this, I hired research assistants at various points to retrace the steps of my analysis by tabulating shots for the same films using the same categories. I wanted to ensure that other scholars following the same procedures could duplicate my results, and the shot categories I ended up choosing seemed to allow for this. Some of the research results are presented below in Figure 6.1, which displays the data for over 350 sound films of 1927-1934, all of whose shots were classified as one of three types: action, dialogue, and singing. (The intertitles that occasionally surface in early sound movies were excluded from the analysis.)

The findings presented in Figure 6.1 allude to the reality behind the frequent complaint that the introduction of recorded sound the editing of motion pictures had become subordinated to the rhythm of the spoken dialogue. Dialogue shots in conversion-era films, Figure 6.1 shows, run, on average, more than double the length of the action shots. No wonder that critics at the time identified the handling of dialogue as the essential aesthetic problem with the talkies.

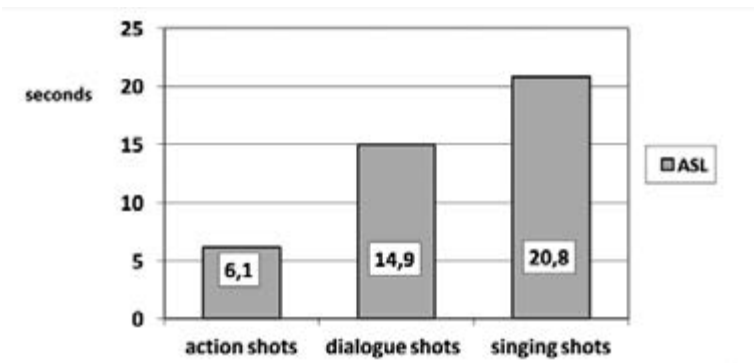

Fig. 6.1: ASLs for three shot types, based on an analysis of 355 sound films of 1928-1934[10]

Less expected is the situation for the singing shots. Of the three types, the singing shots are the most complex. They exhibit the greatest range and variety in length, and their measurements imply the highest margins of error.[11] Singing shots show someone singing, and occur in song-and-dance numbers proper as well as in ordinary scenes, as when an actor briefly whistles a song melody. If the melody is recognizable enough to prompt the viewer's memory of the tune – a major commercial consideration circa 1930 – then it was counted as a singing shot. I had separated out the singing shots as a distinct category because recorded songs were prevalent in cinema circa 1930, and I was interested in how they functioned. My assumption was that the singing shots, like the dialogue shots, last longer, on average, than do the action shots, and the statistics ended up confirming this hypothesis. But the statistics also pointed to something I had not expected to find, which is that shots of singers consistently endure even longer than do shots of speakers. As Figure 6.1 indicates, while the dialogue shots, on average, last roughly twice the length of the action shots, the singing shots last nearly triple that duration.

The excessive length for the singing shots confirmed my sense that this shot category merited special attention. It also raised a new research question, namely: how is the extreme length of the shots of singers in films of the early 1930s to be explained? Answering the question necessarily involved an investigation into questions of film-historical context, and hence the use of additional, non-statistical critical methods. The statistical results merely drew attention to the singing-shot phenomenon. Nonetheless, this flagging of the phenomenon was crucial because it ended up stimulating a novel avenue of investigation.

Average Shot Length

The findings regarding the extra-long singing shots entail one of the most basic of film-statistical practices: the computation of the average shot lengths for numerous individual films that then become factored into an analysis of the norms pertinent to a large corpus of films. Pertinent to the project of specifying norms, whether for a single film or for a large body of films, is a recent debate on how average shot lengths might be calculated. If one takes the trouble to count a film's shots, then the first thing one wants to know is the average length. The customary practice has been to compute the arithmetic mean, commonly known as the Average Shot Length, or ASL. With respect to my sample of shot types, the ASL is displayed in Figure 6.1. The ASL is easy to produce: all that is required is the running time of the film and the

total number of shots. As was the case one hundred years ago, a clock, pen, and paper are the only tools needed. Other measures of central tendency, such as the median or MSL (Median Shot Length), which specifies the middle value in the data set, can require more effort to compute since separate measurements are required for each shot.[12] Today, however, the need for extra labor has been diminished by the cinemetrics interface, which requires that the researcher spend no more time producing the MSL than the ASL. Both measurements--along with many others--are automatically calculated and displayed on the website's data base when an entry is submitted.

The ready availability of additional measurements, along with the statistical expertise now evident in the community of researchers, has made the difference between the ASL and MSL a focus of interest and contention. The MSL is said to be a superior measure for shot length because it is less affected than the ASL by the presence in a film of extra-long shots. Virtually any film includes some shots whose duration far exceeds the mean for the film as a whole. A feature film with an ASL of ten seconds, say, will very likely include some shots that run several minutes, with the consequence that the distribution of shots, when graphed, will exhibit a lop-sided pattern, with most of the results clustering on one side of the chart. Typical is the strong positive skew in Figure 6.2's shot-length histogram for *The Broadway Melody* (dir. Harry Beaumont), the great MGM show musical of 1929:

In Figure 6.2, the 477 shots comprising *The Broadway Melody* are gathered into separate bins, one for each five-second interval, so that shots running between zero and five seconds go into one bin, shots lasting between five

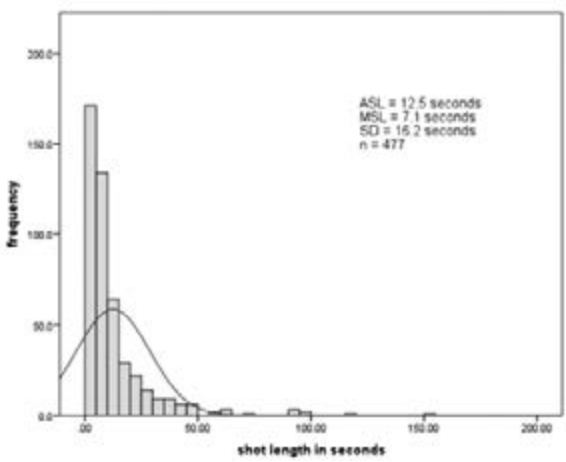

Fig. 6.2: Shot-length distribution for *The Broadway Melody*

and ten seconds go into the next, and so on. The bins on the x-axis are arranged so that they extend from the film's briefest shots on the left to the extremely long ones on the right. Like other films, *The Broadway Melody* includes many short shots along with a small number of extra-long ones. The first column reveals that 171 of the film's shots (roughly one-third of the total) last from zero to five seconds in duration; the second column lists 135 shots running from five to ten seconds; and so on. Most of the shots in *The Broadway Melody* thus run less than the 12.4-second mean for the film overall.

The curve superimposed over the chart represents the so-called normal distribution, which refers to cases where the data is distributed around a central value with no bias either to the left or right. The normal distribution surfaces in a wide variety of types of data, ranging from the heights of people to the sizes of machine-made artifacts, blood pressure measurements, and scores on examinations. But it is *not* ordinarily found in shot lengths for films, whose distributions are typically skewed in the manner of Figure 6.2, with most of a film's shot values falling below the ASL. An explicit case against the utility of the ASL has been made by Nick Redfern, who has proposed as an alternative measure the median shot length or MSL, which "should be used in cinemetric analyses in place of the mean [i.e. the ASL]."[13] The debate has evolved over several years, and has yielded a string of articles and online commentaries, some of which are available on the cinemetrics website.[14] An important intervention came from Mike Baxter, who, in a detailed article, refuted some of specific claims made against the ASL while also raising new questions regarding the validity of particular uses of statistics for film analysis.[15] The arguments involve technical questions that go beyond my knowledge of statistical theory; and in any case, they are too complex to summarize in this short chapter. Nonetheless, certain of the key points can be illustrated with examples drawn from my research into similarities and differences between sound cinema and silent.

The Long Take as Outlier

The tendency for the ASL for a feature film to be higher than a randomly selected shot amounts to a universal phenomenon in my research. It holds for each of the 500 plus feature films that I have measured, all of whose ASLs are higher than the MSLs. A key factor behind the disparity, the data presented in Figure 6.1 suggests, is the frequent occurrence in early

Fig. 6.3: A frame from the 93-second singing shot in *The Broadway Melody* in which Eddie (Charlie King) sings 'You Were Meant for Me' to Queenie (Anita Page)

sound films of song performances. In my corpus of films, the longest takes are often the singing shots. In *The Broadway Melody*, for example, four of the ten longest takes are singing shots, though such shots account for less than seven per cent of the film's total. Exemplifying exhibit certain peculiarities of these shots is the long take that occurs during the inaugural performance of the ballad 'You Were Meant for Me' (see the frame reproduced in Figure 6.3).

In this shot – the sixth lengthiest of the 477 shots that make up the film – Charles King's vocal performance and Anita Page's reaction are rendered through a static composition, shallow focus, and tight framing, none of which are necessary to long takes as they are ordinarily thought of. Indeed, long takes in silent cinema often involved deep staged compositions in which multiple actors are dispersed across the entirety of the set, from the foreground plane to the background, where they interact as an ensemble. At issue in the conversion-era musical films is a different sort of aesthetic, in which the immediacy of the singer's performance takes precedence over the complexity of the mise-en-scène. The many long-take singing performances in cinema circa 1930 are perhaps best understood as a period

artifact, an effect of the fascination (short-lived in retrospect) with singing performances in electric-sound movies.

Shots such as these cannot be seen as outliers, aberrations that can be excluded from the analysis, despite the extent to which song sequences in the early talkies were said to be gratuitous with respect to a film's narrative, to digress from the plot rather than contribute to it.[16] Certain song sequences in conversion-era cinema do indeed seem narratively irrelevant. Think of Harpo Marx's harp performance in *Animal Crackers* (dir. Victor Heerman, 1930) and other films. But such sequences may nonetheless serve an essential formal function depending on the film's genre. The musical comedies of the early 1930s, for example, have been said to exhibit a somewhat distinctive formal logic, a 'vaudeville aesthetic', in which an emphasis on performance virtuosity occasionally takes precedence over narrative development, so that the succession of performance events suggests the rise-and-fall arc of the vaudeville show rather than the causality of classical narration.[17] In this context, song sequences may contribute relatively little to the narrative's causal chain while still bolstering the film's overall form.

Such is the case with the 'You Were Meant for Me' sequence in *The Broadway Melody*, which establishes the emotional reality of Eddie's romantic desire for Queenie and thus inaugurates a major plot shift, away from the show-business narrative about Eddie's effort to get Hank and Queenie roles in the new Zanfield show and toward the emergent romance between Eddie and Queenie, which will culminate in their marriage at the end of the film. The shot's formal centrality is enacted through Charles King's gesture of placing his hands on his chest at the word 'me' during the refrain 'you were meant for me', which occurs on the musical downbeat, a privileged moment formally. The hand-on-the-heart gesture has already occurred in three previous song performances in the film, each featuring the up-tempo title theme, 'The Broadway Melody'. The recurrence of the gesture now, during the introduction of the ballad 'You Were Meant for Me', invites the viewer to compare and contrast this moment with earlier song performances in the film. Parallels across the various performances suggest thematic rather than causal connections but they nonetheless give this unusually long shot a pivotal role in the film's overall formal design. The impossibility of excluding from the analysis shots like this one has made the MSL, which includes extra-long shots without inflating the average in the manner of the ASL, look like a superior measurement of central tendency for shot length. It is unclear, however, whether the differences between the two measurements are meaningful in light of the comparative purposes for which statistics are often used in film study.

Multiple Measurements

Mike Baxter, in his intervention in the central tendency debate, did more than defend the ASL as a useful tool for film analysis; he shifted the terms of the debate by arguing that the ASL and MSL ought to be used "in tandem rather than [treated] as 'competing' statistics from which a choice should be made."[18] An example of what might be learned from the use of both measurements is provided by my research into cinema in the late 1920s/early 1930s. I began this research with a reliance on the ASL to assess similarities and differences in shot type. At that point, I was not aware of the MSL as a potential alternative measurement for shot lengths. But because I had used the cinemetrics interface, which computes both the ASL and the MSL, it was possible to return to the data and to compare and contrast the two measurements. The question behind the return is, did my reliance on the ASL – which, whatever the context, can be expected to be higher than the MSL – give me an exaggerated sense of what was happening with regard to the three shot types? Put another way, if I had been looking at figures for the MSL rather than the ASL, would the situation have shown up differently?

My re-examination of the data suggests that no distortion resulted from my initial reliance on the ASL to assess the differences in shot type because the disparity between the two measurements appears more or less fixed, with a film's MSL, in the vast majority of cases, lasting roughly three fifths the length of its ASL. Typical is *The Broadway Melody*, whose ASL of 12.4 seconds and MSL of 7.1 produce an MSL/ASL ratio of 0.56, which is just slightly below the mean for my sample of sound films of 0.58. Similar ratios are evident when the aggregate shot-length figures are broken down into

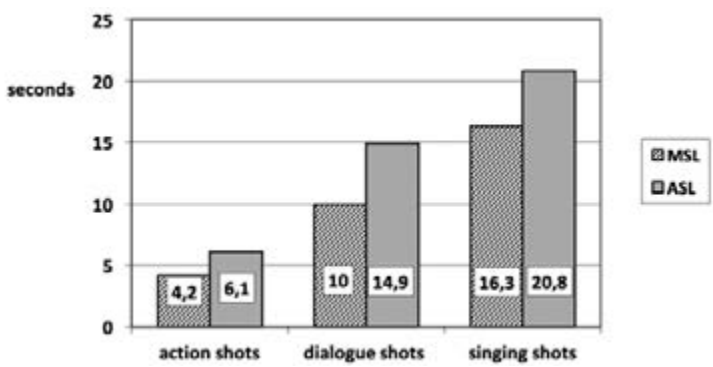

Fig. 6.4: the three shot types, with both ASL and MSL figures listed, for my sample of 355 sound films[19]

the three shot types, as can be seen in Figure 6.4, which presents the ASL results from Figure 6.1 together with analogous data for the MSLs.
Figure 6.4 shows that for my shot types the MSL varies in proportion with the ASL to produce a similar stepwise ordering, so that regardless of whether the MSL is used or the ASL, action shots, on average, run just under half the length of the dialogue shots, which run about three fifths the length of the singing shots. With regard to the self-assessment involved in my research project, the stair-step ratio for the MSL displayed in Figure 6.2 is reassuring because it suggests that the unusual length of the singing shots that I had first noticed in 2006 when I began my research was not an artifact of my reliance at the time on the ASL. In other words, if I had looked at not the ASL but the MSL instead, I would have seen essentially the same proportions across the shot types.

The recourse to a large sample of films, comprising hundreds of titles, made it likely that the differences in shot type will play out even in the case of films of the period I haven't seen, as is indicated in a relatively small 'margin of error' characteristic of a large sample. For instance, the action shots, when measured at a confidence level of 95 per cent, produce a margin of error of 0.2 seconds, which indicates that it is 95 per cent likely that the mean for action shots for the entire population of films from the period – which, of course, includes films I have not seen, let alone measured – will fall within the range of 6.12 seconds plus or minus 0.2 seconds.

Further confirmation of the relatively fixed nature of the ratio between ASL and MSL comes when the frame of comparison is widened to encompass the findings of other scholars, as can be seen in Figure 6.5, which juxtaposes the ASL/MSL ratios for two samples of films, one generated by me and the other by Barry Salt.

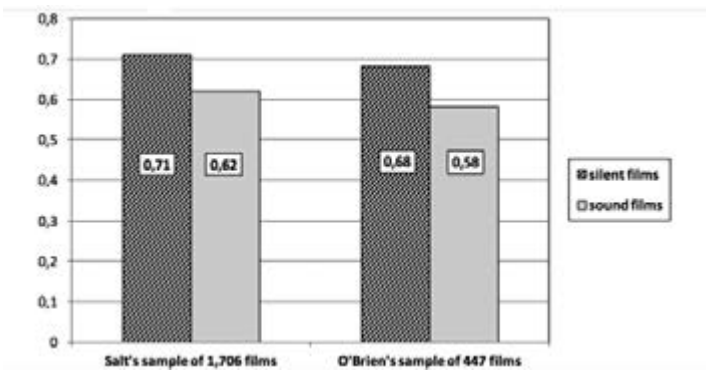

Fig. 6.5: the MSL/ASL ratio for two samples of films, in which silent films are distinguished from sound[20]

The striking feature of Figure 6.5 is the nearly identical shape for the two samples. With respect to the sound films, for example, Salt's finding that the MSL routinely relates to the ASL at a ratio of about 62 per cent comes very close to my ratio of 58 per cent.[21] The similarity in the numbers belies the differences between the samples to which they refer. Salt assembled his corpus by drawing from all feature films contained in the cinemetrics database, whereas my figures refer to a smaller collection of 477 films that I measured myself. Most of my films, it seems, are included in Salt's data set, where they make up less than a quarter of his total. Also, Salt's sample is not simply larger but broader and more inclusive in historical scope, encompassing films from the 1910s up through the present, with no limitation on the country of production, whereas my corpus includes only European and Hollywood films from 1927-1934. The similar findings suggest that shot length tendencies in the early 1930s, whatever the peculiarities of film-technological conditions at the time, are comparable to those at other periods, including the silent period. They also appear to confirm Baxter's proposal that the relation between ASL and MSL is "often sufficiently strong that for comparing 'style' between films it often doesn't matter which is used."[22]

Sound Cinema's Differences from Silent

A further question raised in Figure 6.5 concerns how sound films differ from silent: for both Salt's sample and mine, the MSL/ASL ratio for the silent films is somewhat higher than for the sound films. One explanation for the high ratio might be that extra-long shots are especially prevalent in the sound films, which, after all, were made at a time when the proliferation of long takes was widely noted by critics, and the average shot lengths of films – whether measured by the ASL or the MSL – increased significantly. Adding to the impression that the sound films were made somewhat differently is an intriguing finding from Redfern, who has used an assortment of statistical calculations to argue that sound films have more variety in shot length than do silent: "While sound cinema [...] may have led to the emergence of formulaic editing patterns it also produced a greater degree of variability in shot lengths that is not evident in silent cinema."[23]

To explain the variability will likely require a more fine-grained assessment. One place to begin is with the handling of dialogue, which is approached in silent films in a radically different fashion, via intertitles rather than live-action footage, which, it turns out, carries big implications

for shot length. The basic rule for the length of dialogue titles in American silent films, Torey Liepa reports, was one foot per word, which, assuming a projection speed of sixteen frames per second, yields a running time for intertitles of around one second per word.[24] Only so many words can fit on a title, which makes titles limited in duration in ways that the other shot types are not. With respect to cinema circa 1930, a strong contrast can be drawn between dialogue intertitles and dialogue shots, which in early talkies run up to five minutes in length, as in Groucho and Chico's celebrated 'Why a Duck?' routine in *Cocoanuts* (dir. Robert Florey and Joseph Santley, 1929). My research shows that dialogue shots run far longer, on average, than do the intertitles, with the mean ASL for the shots clocking in at 14.9 seconds, nearly three times the 5.5-second mean ASL for the titles. The difference suggests a rule of thumb regarding dialogue's effect on the pace of the editing in silent films versus sound: while the adding of dialogue into a silent film tended to increase the cutting pace, the insertion of dialogue into a sound film was likely to reduce it.

The peculiarity of the dialogue intertitles is suggested also in an unusual distribution of the data. An indication can be found in the MSL/ASL ratio, which tends to be far higher for the intertitles in silent films than for the dialogue shots in sound films. With respect to the 180 dialogue intertitles in *The Jazz Singer* (Alan Crosland, 1927), for example, the MSL/ASL ratio for comes out to 0.956. The near match of MSL to ASL points to something otherwise virtually never seen in film analysis, shot length data from a

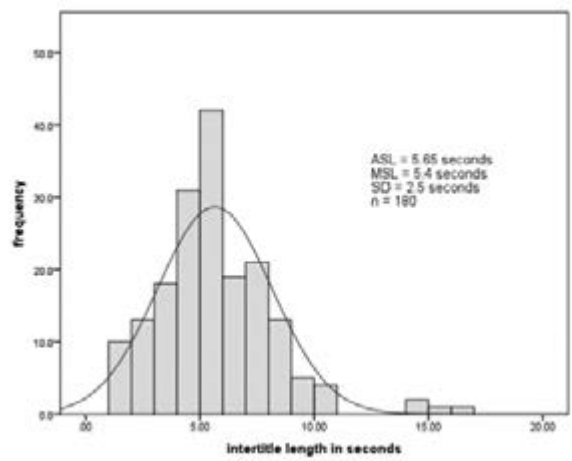

Fig. 6.6: A chart showing the distribution for the 180 dialogue intertitles in *The Jazz Singer*

feature film that exhibits something close to a normal distribution. A graphic representation of the distribution can be found below in Figure 6.6.

The close fit in Figure 6.6 between the data for the intertitles and the superimposed normal curve invites contrast to the shot-length distribution in Figure 6.2 for *The Broadway Melody*, with its strong positive skew. The normality of the intertitle distribution in *The Jazz Singer* seems to hold for other films of the period. With respect to my sample, measurements for the dialogue intertitles in 66 silent films yield an MSL/ASL ratio of 0.936, whereas the dialogue shots in 352 sound films yield an MSL/ASL ratio of 0.671.[25] The nearly one-to-one ratio for the intertitles suggests that they are normally distributed, or almost so, which makes them quite unlike any of the live-action shot types I have examined.

The oddities in how dialogue intertitles function has led Salt to argue that for film-analytical purposes, they ought not be accorded the same ontological status as ordinary shots:

> The unexamined convention in film analysis is that a dialogue intertitle should be counted as a shot. But up to the editing stage, American silent films were shot with the actors speaking the lines in the script, without regard for where the dialogue intertitles would subsequently go. So perhaps the intertitles are distorting the 'natural' lengths of the shots, and hence the shape of the shot distributions of silent films.[26]

Salt's suggestion that the peculiarity of the dialogue titles explains differences in shot distribution between silent and sound films is compelling. But the notion that scenes in silent films were ordinarily constructed without consideration of the position of the titles, that for film producers, the positioning of the titles was an afterthought, is questionable. My examination of the period suggests that the placement of the titles in silent films was, in fact, carefully calculated, according to the basic rule that dialogue titles ought to be preceded and followed by a shot showing the actor's moving lips. The moving lips/title/moving lips pattern is evident throughout *The Jazz Singer* (1927), for example, beginning with the film's first conversation scene. Moreover, the words in the titles often match the lip movements, perhaps because film industry professionals understood that movie-goers were often adept at lip reading, and would complain if the actors' lip movements failed to match the written dialogue.[27]

An indication of the challenges to filmic construction posed by dialogue can be found in documentation concerning the making of the so-called X versions produced at Warner Brothers. A transitional phenomenon,

unique to the years 1929-1931, the X versions were Vitaphone features prepared in special silent versions for markets in Europe and elsewhere where silent exhibition remained dominant. Studio correspondence, available at the Cinematic Arts Library at USC, reveals that personnel at Warner Brothers were keenly concerned with the placement of dialogue intertitles relative to the image of the speaking actor.[28] A major obstacle to modifying the Vitaphone talkies for silent exhibition was precisely that the synch-sound scenes had been made with no consideration given to the eventual need to produce a silent version. The editors at Warner Brothers thus faced the onerous task of creating dialogue titles for scenes that weren't designed for them. Specifying the problem was an executive in the company's Foreign Department, who, in a letter dated 25 May 1931, attributed complaints in Stockholm about the X version of *Sweethearts and Wives* (dir. Clarence Badger, 1930) to the difficulty of locating in this Vitaphone production "spots where you can start and finish a title on one person."[29]

The impact of the dialogue intertitles on the formal design of films is suggested in the amount of a film's running time that titles often take up. The replacement in American films of the 1920s of full-length titles with split-second 'flash titles', Kevin Brownlow reports, eliminated "thousands of feet of negative stock," which accounted for "quite a savings" in both customs fees and shipping costs.[30] Salt reports that for American silent films "the proportion of dialogue titles [usually amounts to] around fifteen percent of the shots in the film."[31] My research into the screen time devoted to dialogue intertitles in 71 silent films from 1927-1930 reveals that such titles, on average, comprise 8.9 per cent of a film's total running time. The quantitative importance of the intertitles lends support to Salt's proposal that their presence in silent films may help explain the formal distinctiveness of silent cinema relative to sound, though, needless to say, more research will be needed before the effects of the titles on film form can be sorted out.

Conclusion

Experimentation in the statistical analysis of film style has increased in recent years as a consequence of the availability of the cinemetrics website and other digital tools and resources. More scholars have become involved in quantitative film analysis, including some with formal training in statistics, which has led to reflection on methodology as never before. This

chapter has explored key aspects of one manifestation of this reflection: the recent debate regarding measures of central tendency for shot lengths. Using examples drawn from my own efforts in film-statistical study, I have taken up Baxter's proposal that ASL and MSL ought both to be seen as essential measurements for shot length, with the two applied in tandem, in comparative fashion, rather than treated as competing statistics from which a choice must be made. By retaining the ASL and comparing it to the MSL, the examples suggest, it becomes possible to see important aspects of film style that could not be seen otherwise– like the differences in shot-length variation between silent and sound cinema touched on in this chapter. This capacity for getting us to look at the films differently points to why the recent surge in film-statistical analysis ought to be welcomed by film scholars: in casting new light on the formal characteristics of films, statistical methods, whatever their limitations in other respects, can renew the discipline's sense of cinema's singularity as an object of study.

Notes

1. These figures can be found in the series of catalogues of Pathé-Frère's output edited by Henri Bousquet. See, for example, Henri Bousquet, (ed.), *Catalogue Pathé des années 1896 à 1906* (Bures-sur-Yvettes, France : H. Bousquet, 1993).
2. See Thompson, *Exporting Entertainment*, 20-22.
3. In Epes Winthrop Sargent, 'The Photoplaywright: Scenes and Leaders', 542.
4. See Salt, *Film Style and Technology*. Revised editions of this text appeared in 1992 and 2009.
5. See, for example, the critique of Salt's project, Bordwell and Thompson, 'Toward a Scientific Film History?', 224-237.
6. Regarding these developments, see Jeremy Butler, 'Statistical Analysis of Television Style: What Can Numbers Tell Us about TV Editing', 25-44.
7. Meyer, *Style and Music*, 64.
8. On the utility of statistical abstraction in the study of literary history, see Moretti, *Graphs, Maps, Trees*, 8-9. The importance of visual displays in the statistical analysis of recorded music is noted in Cook, 'Methods for Analyzing Recordings', 236.
9. Also devised for this research project was an additional, music-related set of three categories that I don't discuss in this chapter: (1) shots with no musical accompaniment, (2) shots accompanied by music whose source is visualized on screen; and (3) shots accompanied by orchestral underscore or some other form of unsourced music.
10. Of the 355 films examined for Figure 6.1, all contain action shots, 352 contain dialogue shots, and 277 include singing shots. Margins of error for

the ASLs were computed using IBM's SPSS SamplePower software, which at a confidence level of 95 per cent, produced the following results: for the action shots (Mean = 6.12; SD = 1.92), the margin of error works out to 0.2 seconds; for the dialogue shots (Mean = 14.9; SD = 5.26), it comes to 0.57 seconds; and for the singing shots (Mean = 20.75; SD = 15.2), it is 1.8 seconds.

11. The high margin of error for the singing shots can be attributed to the comparatively small sample size, high mean ASL, and high standard deviation (for the exact figures, see endnote 9).
12. Besides the mean and the median, the third major option in statistics for producing an average is the mode, which refers to the value in the data set most often repeated. No film scholar has made use of the mode, as far as I am aware, and I omit consideration of it in this article.
13. The quotation is from Redfern, 'Average shot lengths in the films of Terence Davies'. See also Nick Redfern, 'The Average Shot Length as a Statistic of Film Style'. Available at http://www.cinemetrics.lv/dev/fsgt_q1b.php; and also Redfern's numerous blog entries touching on questions of average shot length, which can be found at: http://nickredfern.wordpress.com/.
14. See especially the pieces by Salt, Redfern, Baxter, and Tsivian collected under the heading 'Question 1: Median or Mean?' Available at: http://www.cinemetrics.lv/articles.php.
15. Baxter, 'Film Statistics: Some Observations'.
16. Typical are the remarks on songs in conversion-era cinema in Béla Bálazs, *Béla Bálazs: Early Film Theory*, 206.
17. On the concept of the 'vaudeville aesthetic', see Jenkins, *What Made Pistachio Nuts?*.
18. Baxter, 'Film Statistics', 2.
19. For the mean MSLs in Figure 6.4, I computed the margins of error at a confidence level of 95 per cent using IBM's SPSS SamplePower software, with the following results: the margin of error for the mean MSL for action shots (Mean = 4.16; SD = 1.3) is 0.14 seconds; that for dialogue shots (Mean = 9.97; SD = 3.69) is 0.39 seconds; and that for singing shots (Mean = 16.3; SD = 15.3) is 1.8 seconds. With respect to the ASLs reported in Figure 6.4, the margins of error are the same as those reported for Figure 6.1 (see endnote 9).
20. The figures for Salt's sample, which includes 1,520 sound films and 186 silent films, are taken from Salt, 'The Metrics in Cinemetrics', 15-16.
    My sample includes 378 sound films and 69 silent films.
21. See Salt, 'The Metrics in Cinemetrics', 15.
22. Baxter, 'Film Statistics: Some Observations', 2.
23. Redfern, 'The Impact of Sound Technology on the Distribution of Shot Lengths in Motion Pictures', 6.
24. Liepa, *Figures of Silent Speech*, 238.
25. The mean ASL for the dialogue intertitles in my sample of silent films (n = 66; SD = 1.81) works out to 5.5 seconds versus a mean MSL of 5.16 seconds, which yields a MSL/ASL ratio of 0.938.
26. Salt, 'The Metrics in Cinemetrics', 17.

27. See Brownlow, *The Parade's Gone By*, 296.
28. The correspondence, which includes letters and telegrams, is contained in the file pertaining to Henry Blanke, head of the foreign department at Warner Brothers.
29. The author, Anthony DeLeon, made a similar point in an earlier letter dated 5 May 1931 to Karl MacDonald, who was responsible for supplying Warner Brothers prints to foreign distributors. In this communication DeLeon states his preference to "cut the picture as we would a silent version--without jumping characters around the room.". See also De Leon's letter to MacDonald of 16 April 1931, in which he complains about the brevity of the footage of the actors in conversation scenes, which requires 'making bad cuts and jumping people around rooms'.
30. Brownlow, *The Parade's Gone By*, 299.
31. Barry Salt, 'The Metrics in Cinemetrics', 22.

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About the author

Charles O'Brien is an associate professor at Carleton University in Ottawa, Canada. He is the author of *Cinema's Conversion to Sound*: *Technology and Film Style in France and the United States* (2005) and is now finishing a book called "Transatlantic Style: Movies, Songs, and Electric Sound." Additional research projects and publications concern a variety of topics relating to technology's effects on film aesthetics. Such topics include the use of statistics in the study of film style; staging and editing in cinema prior to World War One; the history of film color; and the history of dubbing, foreign-language versions, and other methods of preparing films for export.

7. A 'Distant Reading' of the 'Chaser Theory': Local Views and the Digital Generation of New Cinema History

Paul Moore

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Abstract
What can the digital generation of film history add to past analog methods? This chapter revisits the 'chaser theory' through searches in digital databases of historic newspapers. Did filmed actualities and attractions really act as mere 'chasers' on vaudeville bills? Charles Musser's debate with Robert Allen in 1984 remains a touchstone of American film history. In principle, digital search results allow the structure of mass practices to be visualized, following Franco Moretti's call for 'distant readings' of textual relations, against 'close readings' of canonical texts. This chapter offers two visualizations of digital searches of historic newspapers across North America and focuses on the adoption of 'local views' by itinerant picture shows after the supposed end of the 'chaser' period.

Keywords: distant reading, Franco Moretti, chasers, vaudeville, local views

From the standpoint of local experience, early film culture was as ephemeral as yesterday's news. Recovering novel aspects of early cinema often relies upon those exceptional copies of newspapers that were kept by libraries and archives. Previous generations of film historians had to review these as bound print or microfilmed copies, but recently digitized newspaper databases allow the digital generation of cinema historians to imagine revising the analog generation's conclusions. For example, I have found reports of the production and exhibition of 'local views' to be remarkably well archived in local newspapers. Consider the smallest note in a column

of 'Local Happenings' in St. John's, Newfoundland in 1905: "The American Vitagraph Company's photographer expects to secure a picture of Water Street from the electric cars to-day; also a view of to-day's Express."[1] Such passing mentions of Vitagraph making local moving pictures appeared sporadically in 1904 and 1905 across Atlantic Canada, New England, and upstate New York. Often buried as town gossip amidst the local trivia of everyday life in small-town newspapers, I take these ephemeral remarks as the foundation for a new cinema history that begins with local film cultures, such as this case from the most easterly point in North America.[2] At the time, Vitagraph was one of the dominant film companies in America, but in Canada in 1904 it began a short-lived venture incorporating local views into their variety shows, briefly promoting 'See Yourself as Others See You' as the primary reason to attend a moving picture show. Soon abandoned as a profit-seeking strategy for the mainstream film industry, this aspect of self-recognition and place recognition remained an occasional part of local film culture, but primarily through independent and marginal producers.[3]

In this chapter, I test the power and utility of digital databases of historic newspapers for early cinema history. I aim to revise – or at least revisit – cornerstones of the history of early film in North America by focusing on circuits of cinema: continental networks of local exhibition and the circulation of itinerant showmen.[4] I present a couple of 'distant readings' of early cinema on a continental scale,[5] framed by the context of revisiting the 1984 'chaser theory' debate between Charles Musser and Robert Allen. Graphing keyword searches between 1896 and 1909, I visualize how the chaser period does indeed seem to end in 1903 with a shift toward narrative cinema following the release of Edwin S. Porter's *Life of an American Fireman*. Mapping the production and exhibition of local views between 1903 and 1906, I show the geographic extent of the brief craze for films of local fire brigade runs – but I cast this in relation to the popularity of *American Fireman* as an early narrative film. In this roundabout way, the deceptively simple question of why Vitagraph made local views of my home town of St. John's required me to revisit one of the originating moments of early film history.

Reading the 'Chaser Theory' across a Digital Generation Gap

American Vitagraph's venture happens *after* the infamous 'chaser' period, and well into the ascendance of the narrative story film. Most of Vitagraph's

local views were exhibited once in one location; they exploit none of the economies of scale allowed by cinema's technological reproducibility.[6] No matter how cheaply produced, they still make no rational sense for mainstream producers of mass culture. Although cinema's images circulated internationally from the start, Tom Gunning proposes "direct address," in particular, to be essential to early cinema, which "also marked the era of local cinema, the travelling exhibitor and the fairground cinema, especially during the period between cinema's highly publicized premieres and the dawn of new permanent theatres."[7] True; but why the effort and expense when Vitagraph's program already included a wide variety of other attractions: illustrated songs, newsworthy actualities, trick films and early narrative fairy tales and comic turns. My answer derives from an aggregation of digital searches of historic newspaper databases, which instantly return trivial, localized mentions of cinema that only collectively gain significance. I propose that the power of such databases allows my digital generation of film historians to revisit the prior analog generation's efforts. I will focus especially on the 1984 exchange on the 'chaser theory' between Charles Musser and Robert Allen as a touchstone of analog film historiography, now decades past. To my distant judgment, Musser's agreement with Allen over the 'chaser theory' is of more interest than their differences. On its surface, the dispute concerned the empirical validity of the commonplace notion that the novelty of moving pictures quickly wore off, relegating them to 'chasers' on the vaudeville bill.[8] This period of disinterest ended with the emergence of the fiction story film, which led the masses to love the 'movies'.[9]

Allen had offered a revision to that conventional take in a 1979 essay that labeled the notion 'the chaser theory', offering plenty of examples of film's continued popularity throughout the supposed 'chaser' period of 1898 to 1903. In particular, he offered the concept of early cinema as a "visual newspaper" and singled out the appeal of local views and French comic and trick films to indicate there was far from "nothing whatever of interest" happening before the story film.[10] Those specific points mark admiring agreement from Musser. Indeed, the term 'visual newspaper' became central to Musser's detailed analysis of the years 1898 to 1901 in the dissertation that led to *Before the Nickelodeon*, an essential work of American film history told through the prism of Edwin S. Porter as a pioneering filmmaker.[11] Musser yielded little else, attacking Allen's revision of the 'chaser theory' with rhetorical and methodological zeal, testing the hypothesis with triangulated evidence, qualitative, quantitative and discursive, that confirmed how moving pictures suffered a period of

socio-cultural and political-economic disinterest, exacerbated by Edison's litigiousness, before a distinct resurgence of activity mid-1903 in production and exhibition alike. The turning point coincided with the release of Porter's *Life of An American Fireman*. Musser had cast the 'debate' as a matter of divergent ideological orientations to the dialectic of creative production and commercial exploitation as the foundation for popular culture and social history. He called Allen's approach "hampered by a disinterest in production" and reminiscent of "corporate liberalism." The journal publishing Musser's essay, *Studies in Visual Communication*, allowed Allen a concurrent rejoinder and Musser a concluding response in turn. Allen pointed to the places beyond his 1979 essay where he went into more depth, more nuance; he provided a valiant defense that their consistently overlapping evidence diverged only in emphasis. It is easy to sympathize with Allen's bewilderment; it is also easy to admire the depths of Musser's access to new archives, sources, and methods to seamlessly weave together exhibition and production, as became impressively clear with the publication of *Before the Nickelodeon*.

The end result of his and others' rigorous approach: "Film history courses put aside their copies of Lewis Jacobs and Terry Ramsaye and started reading new work by Charles Musser and Richard Abel based on primary sources."[12] Of course, Abel's own definitive take on the 'chaser theory' in his opening chapter of *The Red Rooster Scare* (1999) noted, along with Musser, how the emergence of the American fiction film in 1903 coincided with a monkey's knot of shifting circumstances: the emergence of film rental exchanges and standardized illustrated song production, the rapid expansion of small city 'family vaudeville' theaters and small town circuits for itinerant 'picture shows'. Musser[13] more specifically cited the 1903 introduction of the three-blade shutter to reduce flicker as a neat marker of the shift, for those predisposed to technological determinism. It is that complexity of aesthetics, technology, cultural, and political-economic factors – the ability to at once look at the screen and all around – that marks the strength of Musser's work. This is contrasted against Allen and his colleague (later co-author) Douglas Gomery, who rarely direct their eyes toward the screen.[14] In the 'Chaser Theory' folio, strictly speaking, the divide between Allen and Musser is not stark. Allen's emphasis on audiences and reception on the social and geographic margins was not articulated until later.[15] And Musser's[16] work analyzing the origins of Porter's pioneering production, also his editing and curation of the Edison papers,[17] is barely evident in the 1983 'chaser theory' essay. Another difference went unstated at the time: Musser may also have been signaling

Allen's outsider status from the group of film historians who had been catalyzed by attending the 1978 Brighton conference, Cinema 1900-1906.[18] Although they now appear members of the same analog generation, Allen's dissertation preceded Musser's by a decade – 1977 vs. 1986 – but it is a crucial divide for film history because they lie on either side of the Brighton conference. Musser attended Brighton as a student near the beginning of his dissertation research, and he benefitted (as did other participants) from Brighton's energetic catalyst for their collective and often collegial work.[19] The points of agreement – visual newspaper, local views, trick films – actually align Allen's work with the emerging 'new film history' that has since come to be associated with participation at Brighton.[20] In the end, Allen seems chastened simply for being a predecessor – a risk of my own revisiting the 'chaser' debate here.

'Distant Reading' of the 'Chaser Theory'

In principle, digital search results allow the structure of mass practices to be visualized. Franco Moretti defined a 'distant reading' as an analysis across texts, as opposed to a 'close reading' of the text itself. The distant reading allows for a "focus on units that are much smaller or much larger than the text: devices, themes, tropes – or genres and systems."[21] Restricting analysis to aesthetic innovations of canonical works only considered texts tautologically worthy of close reading, ignoring the vast majority of literature. First articulated before the humanities became digital, Moretti's initial call for a 'distant reading' was not in principle computational, although it was in essence quantitative. The concept was part of his effort to study literature's material practices as the circulation of reading practices, genres, styles.[22] He turned to the visualizations of *Graphs, Maps and Trees*. 'Distant reading' could rely upon ephemeral and partial knowledge of the neglected mass of literature, including lost texts that *cannot* be read closely, despite leaving traces of their production and promotion.[23] The point was not to displace close reading and qualitative interpretation.[24] Moretti's central point was that the study of the entirety of literature was possible, and indeed was essential for a better understanding of literacy and literature as a political-economic, industrial pursuit. In this respect, he redefines literature as mass culture, and brings the methods of comparative literature closer to those of cinema and media studies. The unit of analysis for film history is, of course, the 'text' of films, but for early cinema the 'text' can easily be expanded

to become the 'show' – a confluence of films in a production context, showmen in an exhibition context, and audiences in a social context. This contextualized definition of a 'show' can be translated into maps or charts of the circulation of films, genres, or showmen-exhibitors. Digital newspaper databases do not simply allow close reading at a distance; a more structured view of cinema results from attempting to visualize patterns within amassed quantities of local facts, each trivial but all together substantial. Analytically, the aim is to be as lucid as Musser using Porter to recount the history of early cinema, except without the central figure to provide coherent narrative structure.

To be clear, I am not proposing an entirely decentered film history in which trivial, passing figures are valorized for their marginality. I am merely using a distant view of the 'chaser theory' to complement and visualize how key figures are networked in relation to marginal figures. The difficulty is distinguishing structured patterns from empirical case studies. As a starting point, let me present a view of the structured pattern of pictures-and-vaudeville that eliminates empirical case studies altogether. In its most basic form, the first of the two hypotheses in the 'chaser theory' takes a quantitative measure of the popular appeal of cinema relative to vaudeville. Both Musser and Allen agreed that regional variation was apparent and important to consider – New York alone was not sufficient; its differences from Chicago just a starting point. But how many case studies would suffice to make a generalization? On one extreme, all available cases can be transformed into a single statistic counting the frequency of film on vaudeville bills as reported and advertised in newspapers. Elsewhere, I have argued for the centrality of newspaper publicity in constituting early cinema's audiences as a mass public. Early cinema's viewing audiences were always already reading publics. In addition to local advertising and publicity, metropolitan news about film technology and popular vaudeville shows circulated through newswire and syndication in advance and well beyond local opportunities to see and experience moving pictures.[25] This special status of newspapers' centrality to popular and public culture at the turn of the twentieth century allows me to substitute the prevalence of cinema in newsprint for its status in vaudeville. Graphing the results (Figure 7.1) charts the prevalence of cinema within vaudeville between 1896 and 1909.[26] The effect of this particular type of 'distant reading' is geographic flattening, since newspaper items from any location are weighted equally, counted as equivalent. While the statistic erases the local context of each news item, it provides a rudimentary measure of film-within-vaudeville across North America, with the obvious disclaimer

that the prevalence of film and vaudeville does not necessarily correspond to its popularity.

Anyone who has used digital newspaper databases will know this estimate of film-and-vaudeville contains a degree of error.[27] The most obvious problem is the lack of precision in optical-character recognition, but indecipherable text is not new to digital searches. Illegible sections stem from the ephemerality of newspaper form and news as a genre. Digital copies are almost entirely made from microfilm, whose poor quality was compounded by newsprint's sometimes uneven tone, flaking, or yellowing. In any case, microfilm permitted libraries to expediently toss the bulk of bound print copies long ago.[28] Unique to digital searches, however, is the unpredictable coding of newspaper pages into component items, which can range from single ads up to an entire page, depending on the algorithm used when the page was added to the database. For the chart here, the size of the sample more than makes up for the error: a quarter million hits for cinema from May 1896 to April 1909, half a million for vaudeville, nearly 70,000 times when the two overlap in the same newspaper item – on average 100 times a week. The shape of the graph succinctly illustrates why there was a debate over the chaser theory in the first place. The main trend from 1896 to 1902 is the variance from month to month. Although there are moments in the 'novelty' years, 1896 and 1897, when more than ten per cent of vaudeville hits also mention cinema, there is a general unpredictability during the 'visual newspaper' period, 1898 to 1901. Neither a precipitous shift to disinterest, nor a sustained popularity is apparent. The best linear fit shows a slight decline for the early period, with fewer peaks of popularity through the end of 1902. A dramatic upward trend begins in 1903, but the turning point would have been hidden until mid-1903, when the rate of film-with-vaudeville is higher than at any point since cinema's arrival. By 1904, cinema's emerging mass adoption is undeniable, due to the corresponding increased number of family vaudeville theaters, amusement parks and itinerant picture shows. The same linear alignment of cinema and vaudeville continues throughout the nickelodeon boom years. In terms of simple correlation in newspaper discourse on a continental scale, this first elementary distant reading using digital database searches confirms the quantitative part of the 'chaser theory'. From 1898 to 1902, there is indeed a gradual decline of cinema within vaudeville, and a steady increase from 1903 throughout the emergence of the fiction film and the nickelodeon.

A more qualitative evaluation of the 'chaser theory' requires a slightly closer reading of the relative popularity of film genres. The quantitative

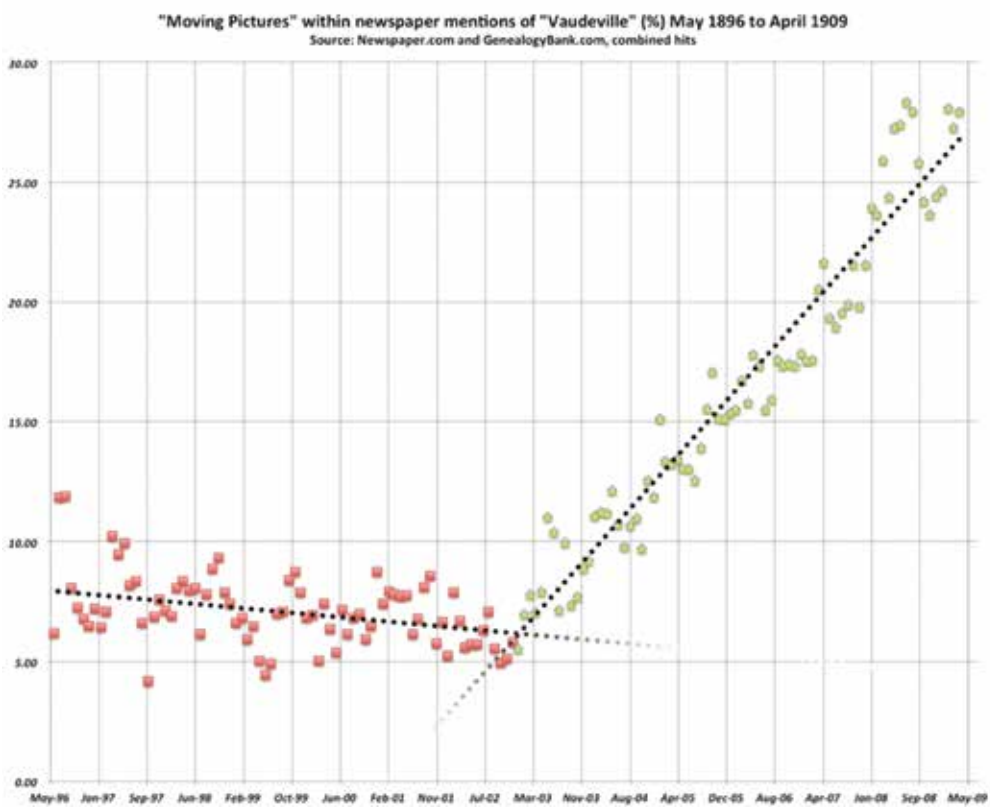

Fig. 7.1: Prevalence of cinema within vaudeville between 1896 and 1909

increase of film-within-vaudeville in 1903 should correspond to the emergence of the fiction story film and the decline of the 'visual newspaper'. The statistical graph above offers nothing toward this question, but the newspaper databases are nonetheless useful to provide a quick comparison with Lyman H. Howe, subject of another benchmark book by Musser with Carol Nelson.[29] Like Howe, the itinerant careers of Alonzo Hatch and John P. Dibble both span the 'chaser' period from 1898 into the nickelodeon years.[30] Hatch's Electro-Photo Musical Company toured a circuit from eastern Pennsylvania to northern Vermont from 1897 to 1909. Dibble's Moving Pictures traveled around New England and northern New York from 1898 to 1910. Both featured illustrated songs in combination with moving pictures right from the start of their business.[31] Newsworthy events are initially the only specific films named in publicity – the Spanish-American war in 1898, the Galveston Cyclone in 1900, and the Buffalo Pan-American Exposition where President

McKinley was assassinated in 1901. Fiction films are first singled out by name late in 1902 and early in 1903, when both Dibble and Hatch mention *Jack and the Beanstalk* as a special feature. Conspicuously in support of the 'chaser theory', Hatch and Dibble begin to list multiple fiction film titles late in 1903 and early in 1904: Hatch featured *Uncle Tom's Cabin*, Dibble cited *The Haunted Inn*, and both mention *A Daylight Burglary*, among others. At least one review of Hatch's show reported how *Life of An American Fireman* "awoke the audience to a pitch of excitement and enthusiasm seldom witnessed."[32] Its familiar dramatic scenes were listed in sequence: "the arousing of the sleeping firemen, the leashing of the excited horses, the dash to and along the street, the arrival at the fire, the work of extinguishment, with the climax of the rescue of a mother and child from the burning building." In 1907, ads for Dibble's 11th annual engagement in Watertown fought for attention in the newspaper, surrounded by ads for four nickelodeons and a new vaudeville theater. Dibble dropped his price and reminded readers of the value of his show: "We do not give half-hour exhibitions of rented films, but nearly two hours of Our Own carefully selected moving pictures."[33] Indeed, there is less change *within* Dibble's ads over time than compared to the nickel shows. If the fiction story film is emergent in 1903, its predominance is not obvious until the daily ads for nickelodeons that start in 1906.

It is worth returning to *Life of an American Fireman* for an even closer reading of its arrival to complement Musser's detailed account of its production and cultural context.[34] Tracking the emergence of the fiction film can be built case-by-case through specific titles, such as Richard Abel's overview of the circulation of Méliès's *A Trip to the Moon* in the United States, which also charted the film's relation to precedents and variants beyond moving pictures.[35] The same snapshot can locate when, where, and in what context key film titles are singled out by name in amusement advertising. For example, *Life of an American Fireman* is mentioned by its title (or nearly its title) early in March 1903 in Manhattan and Brooklyn, and in Chicago by the Kinodrome at Kohl & Middleton's Haymarket vaudeville theater; a brief description of what the Kinodrome offered was already routine at the time, with *Rip Van Winkle* and *Jack & The Beanstalk* named a few weeks earlier. By the end of March, an itinerant Kinodrome brought the film to Dixon, Illinois, for a show that doubled as a benefit fundraiser for the local fire brigade.[36] Such small-town firemen's benefits were common at the time, as itinerant shows in small towns were routinely held under the auspices of local organizations, but this was perhaps the first time *Life of an American Fireman* was featured explicitly in relation to the work of local firemen. By the end of 1903 and throughout 1904, various itinerant exhibitors routinely

used the film precisely the same way. Indeed, the popularity of *Life of an American Fireman* seems to spark an interest in producing local versions in conjunction with dozens of fire brigades, coast to coast, from late in 1903 until 1906, precisely *between* the 'chaser' period and the nickelodeon.

'Local Views' and the 'Chaser Theory'

Mainstream film companies' occasional production of local views is well known in the earliest years; recall how popular interest in 'seeing oneself as others see you' during the chaser period was a key point of agreement between Allen and Musser. Immediately in 1896, the ability to easily produce local views distinguished the Lumière Cinématographe from the Edison Vitascope. Already by November 1896, vaudeville showmen such as Sylvester Poli in New Haven and John Foley in Harrisburg commissioned local views especially for their own theaters. In 1897, Edward Amet collaborated with newspapers to make Magniscope views in Chicago and Omaha, depicted in illustrate feature articles; he also helped train Richard Hardie in Winnipeg to produce local views of the Canadian prairies, first toured there before being used in the United Kingdom to spur immigration to Canada. Between 1897 and 1900, American Biograph routinely produced local views to spice up its program in metropolitan cities from Boston to San Francisco; Sigmund Lubin produced several local Cineograph views in his hometown Philadelphia; American Vitagraph occasionally included local views on its programs for itinerant shows and rural chautauquas, as well as at metropolitan vaudeville theaters.[37] Working out of Chicago, William Selig's Polyscope and George K. Spoor's Kinodrome had employees make local views, for example by Donald J. Bell for Kinodrome shows in summer parks in Michigan and Ohio in 1900, Selig himself for Polyscope shows in Edward Shields' summer park in Des Moines in 1901, allowing Shields to proceed to make local views for his summer parks in Oregon. Polyscope's Thomas S. Nash worked with Shields in 1903, but earlier trained H. H. Buckwalter in Colorado and Wyoming, where local views could be added to the Polyscope catalogue as typical 'western' scenes.[38] Almost from the beginning, filming of newsworthy special events was combined with a more generic approach. Local views were made alike from one town to the next: crowds of children leaving school, workers leaving the factory, and – always, every time – the town fire brigade racing down the main street in an exhibition of their firefighting equipment.

Beyond this quick list of early ventures into local views during the 'visual newspaper' period, I find an upsurge of this primal form of the 'cinema

of attractions' *after* the chaser period, and on a continent-wide scale by a handful of itinerant exhibitors (Figure 7.2). The first company to have their advance agent produce local views – primarily fire brigade runs, usually shown with Life of an American Fireman – was an outfit run called the International Bioscope, beginning in August 1903. The company was an American offshoot of the London Bioscope, which came to Canada in 1901 with A. J. West's 'Our Navy' and went on to produce the well-known 'Living Canada' series for Urban's Warwick Trading Company. In the United States, instead of nationalist scenic films the company turned to local views on a coast-to-coast path from Pennsylvania to California, back and forth through the Southwest and Midwest several times for three years. The scheme was followed late in 1903 by the Chicago Novel Show Company in towns throughout the Midwest and Pennsylvania; this company honed the pitch of providing a Firemen's Benefit concert, showing the local fire run amidst dozens of firefighting films, and always including *Life of an American Fireman* as the fictional prototype. The gimmick was exploited even further by Edward Shields from 1903 to 1907, alternating his summers in Oregon with winter itinerant routes across the Midwest; 'Shields' Fire Fighters' gave benefit fundraisers with programs of local and metropolitan fire runs. Finally, a long-standing touring company, the Fiske-Stock Company briefly added 'The World in Motion' to its show late in 1905, with Meyer Cohen acting as advance agent taking local views later shown as part of the picture program.

Fig. 7.2: Early ventures into local views during the 'visual newspaper' period

In Evansville, Indiana, Cohen's letter of thanks to the Fire Chief was quoted in the paper: "The turn-out and run given by the department today was the finest we have ever taken. When I say this, it covers a large field. We have taken moving pictures of fire departments in over 300 cities and towns in the United States and Canada, but the one taken today will undoubtedly take its place at the head of the list and can be exhibited with credit to the city of Evansville throughout the land."[39] With the 'World in Motion' scheme visiting only its tenth locale, Cohen's figure of 300 must be referring to his work the previous year with American Vitagraph in the Canadian Maritimes, and the company's further work upstate in New York and across New England.[40]

As I noted at the start, the systematic exploitation of local views from 1903 to 1906 is most curious when it comes to American Vitagraph – indeed its expanded venture into itinerant exhibition is curious, too. Why did the predominant producer-exhibitor turn to itinerant shows in marginal locations featuring local views just as the industry was turning to fiction films? Allow me, in conclusion, to look closely at the work of the American Vitagraph in Atlantic Canada in 1904 and 1905. This 'close reading' started with entirely surprising results of digital searches, extrapolated with microfilm searches for locations without digitized newspapers. Before the American Vitagraph Company transformed into a major early film studio in 1905, the company provided the films, projectors, and projectionists to metropolitan vaudeville houses, and ran an extensive itinerant film service across the Northeast and Midwestern United States and Eastern Canada. Vitagraph exploited all aspects of the still-novel industry, working simultaneously as an exhibition, distribution, and production company.[41] Albert E. Smith and J. Stuart Blackton had their first foray with moving pictures as film exhibitors in New York in 1897, then a brief stint making advertising films in 1898 before riding the bandwagon exhibiting Spanish-American War films, both purchasing from and supplying films to Edison Manufacturing. The American Vitagraph program was soon contracted to provide films to Proctor's New York vaudeville theaters, and by the end of 1898, "Vitagraph was virtually the only East Coast exhibitor of 35mm films that retained a supply of exclusive subjects" of their own making.[42] On this unique strength, the company expanded its service to vaudeville theaters throughout New England and in cities as distant as Montreal and Detroit. The company also established itinerant exhibition routes on the lyceum lecture circuit in the Northeast USA and the Chautauqua circuit in the Midwest, soon stops in Southern Ontario, too. Between 1902 and 1905, the actuality films they produced were shown primarily on their own itinerant exhibition circuits, joining newsworthy views, trick films, and comedic scenes on

variety bills with illustrated songs. By 1904, however, the company claimed to have perfected a mobile film lab.[43] Vitagraph began including local views on its tours of smaller cities and towns around New York and New England (Figure 7.3). One of their shows extensively toured the Canadian Maritimes in the springs and summers of 1904 and 1905 – making moving pictures and exhibiting them on return visits weeks, sometimes months, later. These are some of the earliest known films made in each of Canada's eastern provinces.

In Atlantic Canada, the Vitagraph Company at first promised continent-wide publicity when they solicited community leaders – not least newspaper editors – to help film local scenes and people. The first local films were made in Halifax in May 1904. Once exhibited in early in August 1904, "they were remarkably distinct, and features of Halifax citizens were easily made out [...] Albert E. Smith, treasurer of the American Vitagraph company, who is in the city, says the pictures of the Halifax fire department were put on in Tony Pastor's theater, New York, last week, and made a big hit."[44] Rather than merely local films, Cohen initially emphasized how the films would be shown to Vitagraph audiences in the US "by each of the twenty-six companies which are now on the road under the control of this company."[45] Despite these claims, there is no evidence they played in the US except for Smith's reported claim, quoted above. Returning to the Maritimes in April 1905, the Vitagraph did a first circuit of the region in spring, making local views and showing films of Saint John and Halifax made the year before. Each place saw its own

Fig. 7.3: Advertising for the American Vitagraph featuring local views: (left to right): *Ticonderoga Sentinel*, 15 September 1904; *New London Day*, 13 December 1904; *Fredericton Gleaner*, 12 April 1905, promoting the 1904 Saint John films while local views were produced.

local views on the second engagement in the summer, and these later moving pictures of other towns were shown exclusively in the communities where they were produced. No matter where the cameraman stopped, no matter how picturesque the harbor or unique the landscape, the local views were uniformly of school children, church congregations, crowds at parks – but especially of fire brigade runs. Although the *Saint John Sun* had strenuously touted the possibilities for tourism and investment as it cajoled its readers to get ready to be filmed, its review of the resulting films was dismissive: "These, with the exception of the falls and harbor, are of almost wholly local interest, and do not bring before outsiders any of the attractions of the city."[46]

Having tested the local view gimmick in Canada, Vitagraph began using the gimmick of locally promoted local views in the United States in September 1904 – in those cases, without the false hope of the pictures being shown elsewhere. At least three of its itinerant units produced local views that season, with cameramen preceding exhibitions by about two weeks.[47] This was dramatically quicker than happened in Canada, no doubt due to the proximity of its facilities in New York City. One Vitagraph company made films of local fire brigades in the Midwest. A second outfit covered upstate and northern New York. And a third outfit toured Massachusetts and Connecticut. For several months 'Our Own Moving Picture Concert' and 'See Yourself as Others See You' would be the featured aspect of the Vitagraph program across New England and New York. "Don't fail to see your own hose company running to a fire. See your friends all alive in the moving pictures. See your sweetheart and yourself."[48] The local views were linked to the global reach of the company's cameras: "The Vitagraph photographic operators encircle the globe taking scenes of interest [...] After many years of costly experiments, the Vitagraph Company have at last perfected a portable animated photographic plant, and it is their intention to take local Vitagraph pictures in every town and city."[49] Given how it took at least a week after filming to screen local views, the claim of a mobile film lab should be taken skeptically, but the use of local views in mainstream film program is nonetheless remarkable. For about a year the dominant film company in the United States made local views central to its mainstream program – the moment was fleeting, of course. Just weeks after ending its 1905 Maritime tour, American Vitagraph turned its attention to distribution rather than local exhibition, effectively shutting down its itinerant circuits in order to take advantage of the emerging market for renting films to permanent exhibition sites.[50] Instead of local views shown locally, the Vitagraph and all mainstream film producers subsequently turned exclusively to general interest views and fictional narrative films that could be rented widely and distributed globally.

Conclusion

Although this chapter is written in dialogue with Charles Musser, the main contribution I can add to Musser's work on early cinema in America is to point out it could be revised to include Canada and the Caribbean, to become a history of a transnational popular culture, rather than a national culture. Richard Abel's analog method reached the same conclusion in recounting how cinema became self-consciously American. Other than that, my research largely affirms how comprehensive Musser was in the first place. So, then, why am I driven to generate a new history of early cinema in North America? Why does the research enervate and motivate me when on one level it is a Sisyphean task? In a sense, I am embracing the rupture envisioned by Thomas Elsaesser for film history as media archaeology.[51] The digital transfiguration of microfilmed newspapers dates to the 1990s, and such high-profile titles such as *The New York Times* and *The Chicago Tribune* have been functional for over a decade to those with institutional or commercial access. Copyright, licensing and other negotiations are fraught and remain uncertain,[52] but the Library of Congress has spearheaded a standardized, national project for the United States for newspapers up to 31 December 1922, which have no copyright restrictions. Other affordable databases are mass-marketed for family genealogy, bringing an ever-increasing depth of material and greater functionality. While Richard Abel and Jan Olsson have briefly considered the implications for film history,[53] more attention has been given the digital transfer of entertainment trade publications through the Media History Digital Library.[54]

The material form of media formats has become foregrounded as the foundation for content, experience and knowledge.[55] The apparent immateriality of digital documents has thrown attention on historical print ephemera,[56] as shifting contours of accessibility and durability seem to come with digitization.[57] Newspaper historians (as opposed to journalism historians) now seek to typify form and genre.[58] The benefits of digitization are stark – efficiency, speed, accessibility – but the implications for historiographic method, reliability and interpretation are only beginning to be asked.[59] My digital generation of cinema historians may employ novel tools, may do more, quicker, more thoroughly, but I do not believe we will add new history, not in the sense of undiscovered narratives and neglected stories about the emergence of the technology, the industry, the art form. Even on the margins of local exhibition, I continually find Musser's analog method already noticed and footnoted my online discoveries. In hindsight,

this is not surprising; digital databases don't create documents, they merely transform them and render them accessible at all hours from most any location. The contributions of my digital generation of film historians, and our digitally-generated film history, will be a shift in scale from the case study and the canonical figure to comparative visualizations of the mass character of circuits of cinema, at a distance and, potentially, on a global scale.

Notes

1. *St. John's Telegram*, 24 June 1905. Newfoundland was the last present-day Canadian province or US state to witness moving pictures, not until December 1897 (Moore, 'Early Picture Shows'). Elsewhere, I explain the 'noteworthy' appearance of early cinema in small town newspapers fully as part of a methodology typifying other newspaper-community-cinema relations in terms of the 'newsworthy' logic of the metropolitan daily press, and the 'adworthy' logic of small city newspapers (Moore, 'The Social Biograph').
2. 'New Cinema History' is a research paradigm advocated by Richard Maltby ('New Cinema Histories'; 'How Can Cinema History Matter More?') for a nascent international HoMER project (History of Movie Exhibition and Reception). The point is to develop accounts of cinema as sites of social and cultural significance, putting audience relations to cinema as the central concern rather than scholars' interpretations of film content.
3. Johnson, 'The Places You'll Know'; Toulmin and Loiperdinger, 'Is it You?'.
4. 'Circuits of Cinema: Itinerant Showmanship in North America, 1895-1907' is my major project, funded by the Insight Grants program of the Social Sciences and Humanities Research Council of Canada, 2015-2020, with co-investigator, Sébastien Caquard, and collaborators, Jeffrey Klenotic, Kathryn Fuller-Seeley, and Deb Verhoeven.
5. Moretti, *Distant Reading*.
6. Benjamin, *The Work of Art*.
7. Gunning, 'Pictures of Crowd Splendour', 52.
8. I will not reiterate the genealogy of the 'chaser' label for film as the 'dumb' or silent final act on a continuous vaudeville bill. Suffice to note how most early histories of American cinema state the point casually: Grau (*The Theatre of Science*), Ramsaye (*A Million and One Nights*), and Jacobs (*The Rise of the American Film*), for example, and in journalism for the general public (e.g. 'Craze for Moving Pictures', *New York Sun*, 14 March 1909).
9. As I have noted elsewhere, "the American slang 'movies' was common enough by 1909 to start appearing in journalism, at first always surrounded by quotation marks to signify it as youthful jargon – the 'movies' was where

kids went *and* what they saw" (Moore, 'The Grand Opening of the Movie Theatre', 114).

10. Seldes, *An Hour with the Movies and the Talkies*, 20.
11. Musser, *Before the Nickelodeon: Edwin S. Porter and the Edison Manufacturing Company* and *Before the Nickelodeon: The Early Cinema of Edwin S. Porter*.
12. Walsh, 'Review of *Encyclopedia of Early Cinema*'.
13. Musser, *The Emergence of Cinema*. Also see Musser in this volume, 39-40.
14. Elsaesser, 'The New Film History as Media Archaeology'. Allen begins his rejoinder by pointing to Musser's ('American Vitagraph') parallel debate with Gomery's ('The Coming of the Talkies') economic presumptions about the role of technological innovation in film's cultural success.
15. For example, Allen, 'Relocating American Film History'; 'From Exhibition to Reception'.
16. Musser, 'The Early Cinema of Edwin S. Porter'.
17. Musser, *Thomas A. Edison Papers*.
18. Holman, *Cinema 1900-1906*; Gaudreault, *Cinema 1900-1906*; Gartenberg, 'The Brighton Project'.
19. Musser, 'Historiographic Method'.
20. Gaudreault and Gunning, 'Early Cinema as a Challenge to Film History'; Elsaesser, The New Film History as Media Archaeology'; Gauthier, 'Periodization as a Political Process'.
21. Moretti, 'Conjectures on World Literature', 57.
22. Moretti, *Atlas of the European Novel*.
23. Brake, 'The Longevity of "Ephemera"'.
24. Nicholson, 'Counting Culture'.
25. Moore, 'Advance Newspaper Publicity'.
26. The graph measures the percentage of search engine hits from two subscription newspaper databases, www.newspapers.com and www.genealogybank.com, which both allow complex Boolean searches. For each calendar month, I took the count for (vaudeville or variety) and (theatre or theater), and calculated the percentage of times those 'hits' coincided with any of thirteen words or phrases for cinema. My choice of projector names had to change annually because of a maximum limit of characters one of the databases would accept. The phrases or projector names chosen were as follows: 'moving pictures', 'motion pictures', 'animated pictures', biograph, cinematograph, bioscope, kinetoscope, vitagraph (1896-1909), vitagraph, kinodrome (1899-1909), polyscope (1900-09), kinetograph (1902-09), projectoscope (1896-1901), wargraph (1896-99), veriscope, and cinematographe (1896-1898). Other newspaper databases did not allow this degree of precision in searches, including the stellar collection openly accessible through the Library of Congress, www.chroniclingamerica.loc.gov.
27. Abel, 'The Pleasures and Perils of Big Data'; Liddle, 'Reflections on 20,000 Victorian Newspapers'.
28. Baker, *Double Fold*.
29. Musser and Nelson, *High-Class Moving Pictures*.

30. Other research on itinerants tends to consider exhibitors working as specialty acts for other touring theatrical companies until 1903 or later, rather than running independent 'picture shows' during the 'chaser' era. Fuller begins *At the Picture Show* with Cook & Harris – not independent exhibitors until 1904. Lowry ('Edwin J. Hadley') profiled Edwin J. Hadley, who worked under Lyman Howe until 1903 except for a brief period in 1899. Archie J. Shepard all but saturated the entire Eastern and Southern US with several touring picture shows and Sunday concerts at city vaudeville theaters (see Abel, *The Red Rooster Scare*), but before 1903, he provided pictures between the acts of the Maud Hillman Stock Company. Pryluck ('The Itinerant Movie Show') provides a good overview of the research problems posed by itinerant exhibition.
31. Altman, *Silent Film Sound*.
32. *Williamsport Gazette & Bulletin*, 22 June 1904.
33. *Watertown Times*, 21 September 1907.
34. Musser, *Before the Nickelodeon: The Early Cinema of Edwin S. Porter*.
35. Abel, '*A Trip to the Moon* as an American Phenomenon'.
36. *Dixon Telegraph*, 28 March 1903.
37. On the 'local view', see Jung ('Local Views'), Toulmin ('Local Films for Local People'), and Gunning ('Before Documentary'). Musser ('*The Emergence of Cinema*') notes many instances of the production of early local views. Perhaps the first explicit promotion of 'local views' was for the Vitascope at Koster & Bial's: *New York World*, 26 July 1896. 'Local views in preparation' for the Cinématographe: *Philadelphia Times*, 26 July 1896; filming, 6 September 1896; being developed in Lyons and due to be exhibited, 25 October 1896. Correspondence from Andrew Holland to Raff & Gammon. Baker Library, MSS 692, Volume 6, Folder 7, 10 August 1896, notes local scenes filmed and shown by the Cinématographe in Montreal. Local views on the projectoscope for Foley's Bijou: *Harrisburg Telegraph*, 9 December 1896; of special note is the local filming of a staged comic scene of police fight and arrest of a drunk, carried away in a paddy wagon, 24 December 1896. Biograph local views for Poli's Wonderland: *New Haven Register*, 17 November 1896. Edward Amet in illustrated feature articles: *Chicago Tribune*, 4 April 1897; *Omaha World-Herald*, 12 December 1897. Amet with Hardie in Manitoba: *Winnipeg Free Press*, 3 September 1897; *Brandon Western Sun*, 22 September 1897. Local views for the Biograph: *Boston Herald*, 11 July 1897 through 1898, *San Francisco Chronicle*, 5 November 1899, and *Cleveland Plain Dealer*, 30 April 1899. Lubin's Cineograph: *Philadelphia Times*, 14 September 1897, and regularly through 1898. Vitagraph: *Richmond Times*, 7 November 1899; *Waterloo Courier*, 12 July 1900; *Boston Herald*, 9 December 1900; and *Brooklyn Eagle*, 1 September 1901.
38. Musser ('*The Emergence of Cinema*') provides excellent overviews of Selig's Polyscope and Spoor's Kinodrome companies. For Bell's filming for Spoor, see *Grand Rapids Press*, 8 May 1900 and *Mansfield News*, 7 July 1900. For Selig filming, see *Des Moines Capital*, 30 May 1901; *Portland Oregonian*, 13 October 1901; *Denver Rocky Mountain News*, 20 May 1902, and *Portland Oregon Journal*, 19 May 1903.

39. *Evansville Courier*, 16 September 1905.
40. Musser ('*The Emergence of Cinema*', 405) briefly noted Vitagraph's local view making in 1904. I have confirmed more than 50 locations where the Vitagraph made local views in 1904 and 1905, so the figure of 300 is perhaps not much of an exaggeration. In December 1904, Cohen had severed his connections with Vitagraph in a veil of larceny, briefly accused by Vitagraph's Albert Smith of absconding with the advance contracts and receipts from the tour of Canada (*New York Herald*, 16 December 1904; *New York Times*, 20 December 1904).
41. Gartenberg, 'Vitagraph before Griffith'.
42. Musser, 'American Vitagraph', 27.
43. 'A New Idea in Moving Pictures', *Plattsburgh Press*, 21 September 1904.
44. *Halifax Herald*, 12 August 1904.
45. *Saint John Sun*, 9 July 1904.
46. *Saint John Sun*, 17 April 1905.
47. Musser, *The Emergence of Cinema*, 405.
48. *Ticonderoga Sentinel*, 15 September 1904.
49. *Plattsburgh Press*, 21 September 1904.
50. Musser, 'American Vitagraph', 40.
51. Elsaesser, 'The New Film History as Media Archaeology'.
52. Gabriele, 'Transfiguring the Newspaper'; Horrocks, 'Nineteenth-Century Journalism Online'.
53. Abel, 'The Pleasures and Perils of Big Data'; Olsson, 'Screen Bodies and Busybodies'.
54. Hoyt, 'Lenses for Lantern'.
55. Gitelman, *Paper Knowledge*.
56. Cocks & Rubery, 'Margins of Print'; Mussell, 'The Passing of Print'.
57. Nicholson, 'The Digital Turn'; Brake, 'Digital Form'.
58. Mussell, 'Elemental Forms'; Barnhurst & Nerone, *The Form of News*.
59. Milligan, 'Illusionary Order'; Upchurch, 'Full-Text Databases and Historical Research'.

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About the author

Paul Moore is Associate Professor at Ryerson University. His media histories argue that audio-visual audiences are always also reading publics, and his work traces the intermedial connections between newspapers and cinema & radio. Essays on early cinema showmanship and exhibition have appeared as articles in *Early Popular Visual Culture* and *Canadian Journal of Film Studies*, as chapters in the books *Explorations in New Cinema History* and *A Companion to Early Cinema*, as well as *Now Playing*, a book about early movie theatres in Toronto. A forthcoming book, *The Sunday Paper, 1888-1922*, co-authored with Sandra Gabriele, recounts the intermedial leisure of illustrated American newspapers.

Section III:
Theory

8. Cine-Graphism: A New Approach to the Evolution of Film Language through Technology

Tom Gunning

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Abstract
Thinking through the relation of the invention and practices of early cinema to technology, one sees that the lack of a defined purpose for this new invention actually corresponds to new understandings of technology as an open field. This leads to an attempt to place cinema and technology in a broader context, in relation to language and human evolution. While the analogy of cinema and language has been an aspect of previous film theory, it has primarily tried to relate film techniques to linguistic systems and has encountered dead-ends. If one returns to the relation that film bears to writing, through the transcription of events onto film, a relation to a different sense of language appears, founded in André Leroi-Gourhan's understanding of gesture and writing.

Keywords: Bernard Stiegler, film language, gesture, film theory, early cinema

Technological Drive versus the Technology of Purpose

Cinema appeared first as a particular technology at the end of the nineteenth century; but precisely what it would be used for was not immediately clear.[1] The work, both historical and theoretical, of my friend and colleague André Gaudreault indicates that cinema's purposes were originally less well defined than were its mechanics.[2] As Gaudreault has shown, cinema as a cultural form emerged gradually from a number of differently defined uses and rather separate cultural series. These include: Marey's need for a

means of recording scientifically the movement of bodies: human, animal, and inanimate; the Lumière's company's desire to extend the market and methods of amateur photography; Edison's attempt to "do for the eye what the phonograph does for the ear," that is, follow one successful recording invention with another. Such examples could be multiplied.

Clearly defined goals play a lesser role in technological development than we tend to think. Paul Spehr's recent massive work on William Kennedy Laurie Dickson's process in inventing the Edison kinetograph and other motion picture devices reveals how Edison's project of inventing commercial motion pictures actually grew out of the conception and construction of the Edison laboratory, which opened in 1888 just before Dickson's research in cinema devices began:

> It was to be the largest most complete research laboratory in the world [...] The focal point of the main building was a two-story library which was to have reference books on every conceivable subject, scientific journals, published patents and other documentation that would support the work of his experimenters. There were to be two machine shops. A general shop with the most up to date equipment and a specialized shop for precision work. A large supply room was to be stocked with every imaginable type of material so that an experimenter could find what he needed on site and not have to wait. The advance publicity claimed that the lab would be capable of making anything from a lady's watch to a locomotive and the stock room would have everything from screws, nut and bolts to walrus hide, swan's down and porcupine quills. There would be a carpentry shop, a blacksmith and glass blowers. On the third floor there was a large room for meetings that became a music room and occasional recording studio. There was a room for photography on the second floor.[3]

Spehr shows that Dickson's duties in the photography room were also loosely defined, and moved between documenting the work of various experiments with photographs, supplying photos of Edison at work to newspapers and journals, to the project of inventing the kinetograph, which eventually expanded to constructing the Black Maria studio on the grounds of the laboratory.

Rather than following a specific plan and defined purpose, the Edison research lab explored various possibilities in materials and methods, often unsure of, or radically revising, their goal as experiments progressed. Research was often not designed to realize a specific project, but to generate projects generally. By assembling materials, apparatuses, and skills, the

Edison laboratory functioned as a sort of technological lexicon, a standing reserve of material and processes that exemplified the technological world and its possibilities. The laboratory expressed a technological drive, the product less of a singular instrumental purpose than of a broad curiosity impelled by principles of mechanics and vagaries of application. Edison's method followed an almost Darwinian process of natural selection and survival of the fittest, rather than simply realizing a pre-conceived intelligent design.

Inspired by this fascinating groping that guided both the invention and the early development of the cinema, I want in this essay to offer a radical revision of how we think about cinema in relation to technology. To do this, I want to revive and revise an analogy familiar to our field but always problematic: the relation of cinema to language. In this revised approach technology, language, and cinema, will be understood within a particular approach to human evolution. As Bernard Stiegler has claimed, understanding technology as simply devising a means to accomplish an end distorts its nature.[4] The technical object itself (and even more an ensemble such as the Edison laboratory) possesses, as Stiegler puts it, a genetic logic of its own, not simply attributable to human intention. We enter here into the understanding of the technical world introduced by Gilbert Simondon in which we seek, as Muriel Combes puts it, "to know the functioning schemas of technical objects, not as fixed schemas but as schemas necessarily engaged in temporal evolution."[5] In Simondon's theory of technology we move from the goal oriented use of the tool to the open technological environment of the machine and its ensembles (such as the Edison laboratory, open to new uses and revisions). Thus, cinema with its initial variety of purposes may not be aberrant, but rather exemplary of a Simondon's view of technical development. "The technical object exists, then, as a specific type achieved at the end of a convergent series."[6]

Thus, the technical object must be understood as more than an inert utensil, a means to a predetermined end.[7] Following Martin Heidegger, *Tekhne* should be conceived as process of growth and unfolding.[8] This is not to claim that the technological processes that resulted in cinema were in any sense random or irrational, but rather that their ultimate outcomes were not necessarily inscribed or foreseen in their origins. The shapes of development only emerge afterwards, in retrospect. I am arguing, certainly, against a narrow teleology in our understanding of technology, but my claim goes further. In order to place cinema within large patterns of technological development, I claim we need to understand technology as a phase of human evolution. In this, I am following the lead of Bernard Stiegler

and others inspired by the work of paleontologist André Leroi-Gourhan who described the history of technology precisely as an extension of the processes of human evolution. As Simondon also demonstrates, rather than being in opposition, the human and the technological define each other. Leroi-Gourhan would claim we become human through our technology.[9]

As historians of cinema, I also believe we need to deal with both technology and aesthetics. I understand this to mean we deal both with machines, their construction, and development, and with the way human beings use them, the pleasures they take in them, and the purposes they inscribe in them. Although aspects of these two issues can be approached separately, I believe a full understanding of either implies the other. Approaching technology as an extension of human evolution undoes a facile separation of technology into means and ends, material and spirit, tools and meanings, but reveals the close interdependencies of *Tekhne* and *aesthesis*. Leroi-Gourhan's work plots a continuity from physiological evolution to the production of tools, as human adaptation moves from physical transformation into cultural production. As he states, "The hand, already formed in the monkey, stops changing [...] from the moment it begins to hold a tool."[10] The production of tools involves a process of exteriorization, a projection of the human into nature, with all the danger of alienation and delights of discovery that entails. Stiegler describes this transformation of the world through our use of objects as "the pursuit of life by means other than life."[11] Exteriorization, Stiegler says, "must not be understood as a rupture with nature but rather as a new organization of life – life organizing the inorganic and organizing itself therein by that very fact."[12]

I find Stiegler's (and Simondon's) approach to technology especially relevant for understanding cinema. However, I am not intending in this essay to comment on Stiegler's recent critique of the role commercial cinema plays in contemporary society, which I find less useful for understanding film history. In contrast, the continuity he asserts between evolution and technology provides me with a new way to think through the history and origins of cinema as well as its contemporary relation to new media, by defining the active role technology plays within these processes, past, present and future. Technology as a force of development, rather than simply a narrow 'technical' issue for investigation, appears especially clearly, I would claim at the point of cinema's origin. Thus, I return to the early cinema that recent French film theory (including Stiegler) continues to bypass in favor of their love/hate affair with the Classical Hollywood cinema and its successors. In its technical hardware and its function as an apparatus (which includes human operators/observers, filmmakers, and film spectators,) the

cinema forms a particularly modern node in the process of exteriorization that defines technology as an evolutionary force. From its beginnings, cinema aspires, as the names of its first machines indicate (Cinématographe, Kinetograph, Vitascope, Vitagraph, Biograph, Bioscope), to the technical enfolding of life and movement itself.

From Transcription to Language: A Sketch of Classical Film Theory

Almost as persistently as they include terms for life and movement, the names of the first cinema devices inscribe their relations to writing and language, the suffix 'graph', appearing if anything more often than the visual 'scope'. For Leroi-Gourhan, the acquisition of language and then of writing represents an essential phase of human evolution extended into technological exteriorization. This novel understanding of language as an aspect of technology allows us, I believe, to re-open the comparison between cinema and language that emerged with its first inventions and then guided the origins of film theory and film stylistics. One might claim that film theory has oscillated between thinking under the dominance either of the *graph*, the significant mark, or of the *scope,* something to look at. Approaching cinema as a technology essentially, and not just contingently, demands that we think it in terms of these two models simultaneously, preserving the productive tension between them. Cinema is both an image *and* a form of writing, and is neither of these in isolation. As a technology, it brings them together through a radical act of exteriorizing the human processes of perception and language in a form of technological memory.

The first theory of film as language (the one which I hope to radically revise) went beyond this reference to the 'writing' or transcription of the cinema, and even denigrated it. The reference to writing inscribed in the names of early cinema devices seems initially quite simplistic and could hardly refer to the systematic nature that defines language. The 'graph' simply parallels the 'graph' of 'photograph' or 'phonograph' and indicates less a reference to language than to the simple act of transcription and recording. The original cinematic machines recorded motion, or life. In subsequent decades, however, this characterization of cinema as a mechanical recording medium was challenged by emerging claim for cinema as an artistic and expressive means of communication. Early film theory fought to establish film's status as an art precisely by claiming that cinema went beyond mere reproduction or recording. Describing cinema as a language in

this context constituted a strategic move that asserted cinema as an art that exceeded the act of transcription. If cinema could claim to be a language, the new medium thereby gained the capacity to carry a message and be expressive, in spite of its lack of sound or speech, its essential 'muteness'.[13] The essence of language (and its difference, as Leroi-Gourhan pointed out, from the limited aural signals of distress or desire given by animals) lay in the abstraction of words from a concrete situation (such as the mating call of a bird) through its combination of signs into a syntax. Thus, in the twenties and later, an emerging semiotics of cinema traced the transformation of film stylistics from single shot films, which recorded specific events, to a succession of shots arranged through editing. As an art form, film in the twenties therefore aspired to the condition of language, articulated by the practice of editing and explicated in theoretical texts by Lindsay, Kuleshov, Vertov, Eisenstein, Epstein, and Dulac.

Thus, a film theory emerged in the twenties, primarily in the writings of the Soviet montage theorists and the Russian Formalists, based in a more or less rigorous comparison of film editing to the abstraction and the syntactical arrangement of language. This privileging of montage implied a certain denigration of the recording capacity of the cinema, the 'graph' aspect of the original invention. The shot was valued less than the cut, the camera meant less, as Eisenstein might put it, than the scissors. Consequently, the first decade of cinema became exiled (as it still is in Gilles Deleuze's *Cinema* 1 and 2), to a sort of 'pre-cinema'.[14] The simple act of filming was not seen as enough to make cinema into a language.

While I would never deny the importance of the articulation between shots in either the history or the theory of cinema (and indeed, I devoted my first book, on the early films of D.W. Griffith, to its origins),[15] I would also claim that declaring editing the defining aspect of either the history or the language of cinema obscures cinema's relation to technology. Certainly, a structural comparison of cinema to language appears natural when dealing with editing. Through editing the shot loses its relative autonomy of reference and reproduction and becomes a differential unit within a sequence, and thus coming closer to a linguistic unit within an utterance. But beware of misleading analogies! The most careful of film semioticians, such as Christian Metz and Yuri Lotman, were well aware of the limits of this comparison.

The reef on which the semiotics of cinema foundered lay in the uneasy fit between the cinematic shot and any linguistic unit. First, nothing in film corresponds to the double articulation of language (in which meaningful units can be broken down into elements that are non-semantic and purely

differential, e.g. phonemes). Further, a single shot cannot be seen as the equivalent to a word (or to use the linguistic term, a morpheme). A shot, even a close-up, contains so much contextual information (in Leroi-Gourhan's sense is too concrete) to function as an abstract element of the lexicon. As Metz indicated, due partly to the shot's individualizing photographic and indexical nature, a shot always carried more than a simple signified (a shot of a gun was never just the sign for {gun} but rather displayed a specific gun – revolver or automatic, antique or modern, large or small).[16] Lotman in some sense cut a Gordian knot by maintaining cinema used two sorts of signs: the linguistic and the pictorial (this later often ignored in linguistically oriented semiotics).[17]

The clarity of these early semiotic or semiological analyses came partly from their modesty, their acknowledgment that the systematic aspect of language only applied to cinema in limited contexts, (for Metz these included the closed set of spatial temporal segmentation of narrative which he analyzed systematically in his 'Grande Syntagmatique'). This admirable acknowledgment of the severe limits of the relevance of linguistics to film also seemed to bring to a close a brief period of new enthusiasm for the language/film analogy, as ideological, psychoanalytical, and perhaps even historical research took center stage. Ambitious social and meta-psychological modes of analysis and interpretation seemed more attractive to many students than the narrow space semiology left to cinema's linguistic parallels.

Graphism, Technology, Evolution, and a New Model of Film Language

I am far from denying the value of this classic era of film semiotics, which all too often tends to be overlooked now, nor am I questioning the interest of the extensions offered by the semiotically inspired approaches to cinematic enunciation and narrative analysis. But I am proposing a new approach, a different model for the relation between cinema and language. This new model follows less closely the model of the language system; instead, it explores, as I said, the relations of language, technology, and human evolution. This new understanding of cinema's relation to language is not limited to classical narrative structures or the paradigms of editing, but illuminates aspects of early and even pre-cinema, as well as new media, through its emphasis on cinema as technology rather than the semiotic analysis of cinematic texts. It, in effect, returns to the 'graphism' of the first cinema devices, and thinks about cinema in relation to writing more than speech.[18]

The suffix so prominent in the naming of the technology of cinema – 'graph' – may provide a clue to this new, non-semiotic, understanding of cinema language. If language constitutes an essential moment in human evolution, the coordination that Leroi-Gourhan traces between speech and gesture, mouth and hand reaches another level with the introduction of writing, or more broadly what he calls 'graphism'.

> While it can at a pinch be claimed that tools are not unknown to some animal species and that language merely represents the step after the vocal signals of the animal world, nothing comparable to the writing and reading of symbols existed before the dawn of *Homo Sapiens*.[19]

With this concept of graphism, Leroi-Gourhan marks out a space in which the opposition Lotman drew between picture and language is no longer absolute. Based on archeological evidence, Leroi-Gourhan claims "graphism did not begin with naïve representation of reality but with abstraction."[20] Tied to the essential motor evolution of the hand, Leroi-Gourhan sees graphism as initially expressing bodily rhythms (i.e. gestures) rather than tracing forms (the pictorial transcription of visual experience). The interaction of the rhythm of oral speech and the gestural rhythms of inscription determined the original scene of writing and reading. As he puts it: "In both signs and words abstraction reflects a gradual adaptation of the motor system of expression to more and more subtly differentiated promptings of the brain."[21] Investigating the arrangements of Paleolithic cave paintings, Leroi-Gourhan finds a consistency not simply in stylistics of depiction but in arrangement of figures, a syntactical pattern in the succession of animals depicted that leads him to underscore their relation to writing and language: "They [the cave paintings] are really 'mythograms', closer to ideograms than to pictograms and closer to pictograms than to descriptive art."[22] He sums up his claim:

> [F]igurative art is inseparable from language and proceeds from the pairing of phonation with graphic expression. Therefore the object of phonation and graphic expression obviously was the same from the outset. A part, perhaps the most important part – of figurative art is accounted for by what for want of a better word I propose to call 'picto-ideography'.[23]

While moving from Leroi-Gourhan's analysis of cave paintings and their inscriptions to cinema seems a bit of a stretch, I nonetheless suggest we make it. Leroi-Gourhan's own understanding of the homology between

the acquisition of language and especially 'graphism' and the long duree of the evolution of human technology invites us to extend his insights to the present era of rapid transformation. He proposes not a simple theory of origins, but an understanding of a history still evolving. Graphism unites picture and language through the concept, not of the *word* in its systematic lexical sense, but as a symbol, through which "humans could now express themselves beyond the immediate present."[24] Graphic symbols maintain a relation between the pictorial and the linguistic, a relation that became more distant and distinct as language and writing developed:

> Two languages, both springing from the same source, came into existence at the two poles of the operating field – the language of hearing, which is linked with the development of the sound-coordinating areas, and the language of sight, which in turn is connected with the development of the gesture co-coordinating areas, the gestures being translated into graphic symbols.[25]

The tension between the gestural/graphic mode of language and language as a phonetic system (the linguistic model referenced by most film semiotics) remains a productive process throughout history, according to Leroi-Gourhan:

> The invention of writing, through the device of linearity, completely subordinated graphic to phonetic express, but even today the relationship between language and graphic expression is one of coordination rather than subordination. An image possesses a dimensional freedom which writing must always lack.[26]

To summarize this account of the relation between language and graphism: coming from a common origin, language develops in two modes: the graphic, or as Leroi-Gourhan refers to it, the mytho-graphic ideogram, and the linear phoneticized writing that developed with the tasks of bookkeeping and genealogy. The increasingly linear and speech-dependent aspect of written language serves as an efficient tool for the conveying of information, as "writing is viewed as an economical method of transcribing narrow but precise concepts – an object achieved most efficiently by linear alignment. The language of science and technology meets such a definition and the alphabet meets its requirements."[27] But Leroi-Gourhan doubts the wisdom of seeing this development as an entirely positive progression, as the graphic quality of ideographic writing becomes eliminated. While the instrumental

view of writing renders tasks of organization and communication more effective and economical, the elimination of the mythographic aspect of writing risks eliminating vital aspect of human culture. Leroi-Gourhan claims:

> Language was placed on the same level as technics; and the technical efficacy of language today is proportional to the extent to which it has rid itself of the halo of associated images characteristic of archaic forms of writing [...] Such unification of the process of expression entails the subordination of graphism to spoken language [...] However it also entails an impoverishment of the means of nonrational expression.[28]

Thus, Leroi-Gourhan's dynamic and evolutionary approach to language and writing not only ties it to technology, but also provides us with a complex model of language practice that extends beyond the structural logic of spoken language. His concept of graphism relates language to the body through the gesture, and demonstrates the connection of the graphic process not only to the phonetic transcription of speech, but to the visual symbol, the mythogram that exceeds the model of spoken word, without necessarily being condemned to the concreteness of the picture as understood by Metz.

One could read the comparisons the Soviet montage filmmakers, Kuleshov, Eisenstein, and Pudovkin (and, to a certain extent, Vertov) and the Russian Formalists made between language and cinema as attempts to subject the mythograms of cinema to a linearization and specification of the sort found in phonetic language. Thus, the syntax of montage in Kuleshov's Mozhukin experiment entailed narrowing the indefinite halo of associations possible in Mozhukin's expression down to a specific significance defined by its juxtaposition with an image bearing a definite emotional meaning.[29] Eisenstein's montage tropes strove for a similar legibility, and pursued an intellectual or emotion abstraction from context.[30]

However, if the polemic launched by Constructivist montage theory stressed this systematic significant aspect of the dialectic, watching the films themselves convinces us that they maintain a creative tension with the graphic, rather than simply repressing it. Further, Eisenstein and the Soviet filmmakers, not to mention the French advocates of *photogénie*, such as Epstein, Dulac, and Kirsanov used editing to create physiological rhythms and emotional tones and overtones, thus embedding attempts at significance in an intense somatic experience. As defined in meaning as Eisenstein claimed his montage sequences strove to be, they always include an excess of rhythmic and graphic material not simply translatable to the

intended meaning (see, for instance, the famous example of 'intellectual montage', the 'Gods' sequence in *October* (1927), in which graphic play and rhythmic cutting between shots conveys formal relations beyond what the visualizing of the argument would seem to require).[31]

Such excesses of film stylistics demonstrate how useful Leroi-Gourhan's theory can be in constructing an embodied understanding of the effects of technology. The gestural nature of the act of writing – and even reading – an ideogram cannot be limited to a decoding of significance. It is worth recalling in this context Eisenstein's invocation of the Japanese and Chinese use of ideograms as his ideal for cinematic language and his model for montage par excellence.[32] Chinese writing, with its strong graphic and even figurative aspect exemplified for Leroi-Gourhan as well the multi-dimensions of ideogramatic writing. Further, Eisenstein's later work, both his films and theoretical writings, involved an immersion in the mythographic. Even a cursory glance at the shots from *Que Viva Mexico* and the stills surviving from *Bezhin Meadow* reveal an interest in the mythic dynamics of composition that go beyond the visualized syllogisms and tropes of his silent films. Likewise Eisenstein's writings (both published and unpublished) following his 1935 essay 'Film Form: New Problems' show his attempt to explore the mythic roots of cinematic expression.[33] Eisenstein's later work could be profitably read in relation to Leroi-Gourhan (and I think the somewhat tangled issue of 'Inner-speech', which Eisenstein adapted from the Russian Formalists might also be clarified if compared to Leroi-Gourhan's idea about the rhythmic and gestural aspects of language and writing).

Graphism, Cinema, and the Exteriorization of Human Memory

Leroi-Gourhan's theory of the interrelation of language and writing with the physical and technological evolution of human being sheds light on traditional theories of the interrelation of language and cinema, showing both their limitations and areas of possible agreement that could be developed. But my initial claim was more radical. Cinema, as well as the welter of new media moving picture technology that has appeared in the last half century, offer more than simply a technical means of recording and preserving the visual (and aural) aspects of events. This is not to deny that visual and aural moving image media accomplish this task, but rather that in accomplishing it, they make a major transformation of our human world. The 'graphism' of the original inventions of cinema and their subsequent progeny constitute a contribution to the relation between technology and human evolution.

Even without a formal analysis of the complexities possible through the language of these media, moving picture technologies are already operating like languages, already participating in the process of exteriorization that defines technology for Stiegler and evolution for Leroi-Gourhan.

For both these thinkers, photography, cinema, television, and computer systems are recent phases in human exteriorization, most specifically of memory, participating in the same impulse behind the development of writing, both phonetic and graphic. Leroi-Gourhan reflects, "audiovisual techniques really seem to represent a new stage of human development."[34] Although they greet this ongoing development with excitement, both theorists also express concern about the ability of the technical reproduction of vision, sound, and movement to render the receiver passive and limit the processes of the imagination and of creative intervention. While these concerns seem to me crucial, they also recall the critique of the ideological complicity of visual media with which our field is very familiar. What seems to me a more novel insight (although possibly just as ambivalent in its implications) is viewing these concerns in terms of the process of automatization in which the operation of technology is no longer related to the directly human controlled hand-tool or hand-held device, but to the self-propelling machine. As Leroi-Gourhan puts it:

> Tools detached themselves from the human hand, eventually to bring forth the machine: In this latest stage speech and sight are undergoing the same process, thanks to the development of technics. Language, which had separated itself from the human through art and writing, is consummating the final divorce by entrusting the intimate functions of phonation and sight to wax, film, and magnetic tape.[35]

The implied question here must be: is this a loss or a gain? In either case it seems to constitute the world we now live in, which may define itself by an ambivalence between the promise of technological development and its actual consequences.

The very act of filming, recording through the camera, denigrated within the period of film theory Metz has called 'Montage roi' represents a fundamental transformation which not only can be compared to the human attaining of language or writing, but seems to involve handing over these processes to our surrogates, the machines in an exteriorization of memory.[36] This gives us a new way to understand the impulse of the first filmmakers to film the world around them, to gather images of a moving reality in a form that could be captured and played again.

Early cinema allowed technology to see the world automatically in a manner that also allowed the world to be 'spoken' back to viewers, including those who had never seen aspects of it. Cinema embarked on a project (unarticulated in most instances, but implicit) of supplying a form of automatic memory. Filmmakers gathered views of events, places, and people that could be replayed, that people could see again and again if desired. While I doubt many of these films were made with a long duree of preservation in mind, this drive toward repetition itself seems to me a significant part of their technological drive, as the recall of memory becomes embedded in the program of a machine.

In an essay I wrote on the early travel film, I lingered over the phrase common in one form or another to both early travel lectures (such as those of Burton Holmes) and a number of early film companies: "The world within your reach."[37] The term can only strike us today as ambivalent, expressing on the one hand the literalization of Heidegger's 'age of the world picture', in which all of nature must be consumed as a picture, as an enframed, graspable form of mastery in which vision claims dominion.[38] But the interchangeability between hand and eye indicated in this trope strikes me now as complex. What the observer will grasp as he attends film or lectures is not even a material picture, but an automated sight, a projected image either through magic lantern or through cinema, a view of a distant locale brought back by the viewer's emissary by the apparatus/camera. In my original essay, I compared this virtual voyage to the return of the veterans in Godard's *Les Carabiniers* who return home from their adventures carrying the loot of the world in the form of postcards. Suffused by such deceptive visions, do we remain, like these deluded mercenaries, empty-handed?

The critique of an image culture, whether a society of the spectacle or an accumulation of world pictures, undoubtedly remains vital to transforming our relation to a culture based on profit and exploitation of both our fellow humans and natural resources. But I have begun to wonder if the project of ideology critique and its hermeneutics of suspicion thoroughly explain our culture's accumulation of virtual images, and the transformations they work in the modern world. Viewing assemblies of such images from the early part of the century – for instance, the collection of Lumière autochromes (the early process of color still photography) and short unedited films from Albert Kahn's astonishing Archive of the Planet assembled between 1911 and 1930 – we certainly experience a certain melancholy, a sense of lost time and fading glances. As images of an era of colonial exploitation, global warfare and the displacements of populations, the Kahn collection certainly reveals a catalogue of horrors.[39] But I, at least, also feel enriched, even when the

images make me squirm with their imperialist project of capturing views of a vanishing exotic world. I find here less a synoptic vision of the world seized by the imperial gaze of the new technologies Kahn's cameramen employed, than a series of fragments of the exteriorized and automatized memory of our planet, dollops of embalmed time, condemned to endless repetition.

In the section of *Technics and Time 1* entitled 'Already There', Bernard Stiegler works through Heidegger's contrast of the inauthenticity of clock time with its mechanical measurements of successive empty nows compared to the authentic time of *Dasein* as a being-towards-death.[40] Heidegger founds authentic human temporality (as opposed to the fallen time of calculation represented by the clock) in *Dasein*'s anticipation in the future of its undoubted, yet indeterminate, mortality. But Stiegler reminds us that this openness towards the future can only be founded on a sense of a past (as *Dasein*'s sense of anticipation is founded by its historicity) that he finds 'fixed' in technics, founded in the *gramme* of writing, which fixes the past in an entirely different way than the tick of the clock marks the abstract now. The past for Stiegler is always transmitted, either inauthentically, in such a way that blocks our access to it, or authentically – but how can this be accomplished? I will not attempt to summarize the implications of Stiegler's response, but his essential answer depends on our access to a temporality that relies on "the memory supports that organize the successive epochs of humanity; that is, technics."[41] The way to our past, which is to say the way to our historical temporality, lies through its technological forms.

Is this authentic relation to the past, then, within our grasp? Does technology deliver our temporality to us as the early filmmakers claimed they could bring us the world? Or do our hands remain empty? And is that, in fact, the only way we can actually receive, with our hands open and unfilled?[42]

Notes

1. I would like to thank Patrick Crogan for some incisive comments on an earlier version of this essay, although I cannot claim to have answered all his questions.
2. On the concept of cultural series in relation to early cinema, see Gaudreault, *Film and Attraction: From Kinematography to Cinema*.
3. Spehr, *The Man Who Made Movies*, 41-42.
4. Stiegler, *Technics and Time 1*, 9.
5. Combes, *Gilbert Simondon and the Philosophy of the Transindividual*, 58.
6. Simondon, *Du mode d'existence des objets techniques*, 26 (my translation).

7. *Ibid*., 68.
8. Heidegger, 'The Question Concerning Technology', in *The Question Concerning Technology and Other Essays*, 1-35.
9. Leroi-Gourhan, *Gesture and Speech*.
10. *Ibid*., 251.
11. Stiegler *op cit*, 17.
12. *Ibid*., 163.
13. Film theoretical writings from Vachel Lindsay on make this claim, but its systematic culmination probably comes with Arnheim's *Film als Kunst* [*Film as Art*].
14. Deleuze, *Cinema I*, especially 24. I discuss this aspect of Deleuze more fully in my essay, 'Animation and Alienation: Bergson's Critique of the Cinématographe and the Paradox of Mechanical Motion' forthcoming in the journal *The Moving Image*.
15. Gunning, *D. W. Griffith and The Origins of American Narrative Film*.
16. Metz, *Film Language*, especially 115-116.
17. Lotman, *Semiotics of the Cinema*, 5.
18. Yes, I am avoiding Derrida here, feeling it more useful to go back to Leroi-Gourhan who influenced some of Derrida's understanding of writing. However, for those so inclined, my new approach to cinema and language might open a new way to thinking about Derrida and cinema.
19. Leroi-Gourhan, *op. cit*., 188.
20. *Ibid*.
21. *Ibid*., 190.
22. *Ibid*., 191, 196.
23. *Ibid*., 192.
24. *Ibid*., 195.
25. *Ibid*.
26. *Ibid*.
27. *Ibid*., 209.
28. *Ibid*., 211-212.
29. The experiment that Kuleshov carried out intercutting a neutral shot of actor Mozhukin with various other shots (a nude woman, a bowl of soup and a dead baby in many accounts) in order to produce contrasting emotion effects has been recounted in many places. For Kuleshov's brief account, see *Kuleshov on Film*, 200.
30. Eisenstein discusses the "montage trope" in his essay 'Dickens, Griffith and The Film Today' in *Film Form*, especially 240-255.
31. See Eisenstein's presentation of this sequence in 'A Dialectical Approach to Film Form' in *Film Form*, 62, with illustrations between 52-53. The classic reading of this sequence as a visual argument is presented by Noel Carroll in 'For God and Country' in *Interpreting the Moving Image*, 80 -91.
32. Eisenstein, 'The Cinematographic Principle and the Ideogram', in *Film Form*, 28-44.
33. Eisenstein, 'Film Form: New Problems', in *Film Form*, 122-149.

34. Leroi-Gourhan, op. cit., 213.
35. *Ibid*., 216.
36. Christian Metz, *op. cit*., 31-37.
37. Gunning, 'The Whole World Within Reach'.
38. Heidegger, 'The Age of the World Picture', in *The Question Concerning Technology and Other Essays*, 115- 154.
39. The Kahn project has been analyzed in Amad, *Counter-Archive: Film, the Everyday, and Albert Kahn's Archives de la Planète*. The photographs appear especially in David Okuefuna, *The Dawn of the Color Photograph: Albert Kahn's Archives of the Planet* and both photographs and films were featured in the BBC series *The Wonderful World of Albert Kahn*.
40. Stiegler, *op. cit*., 204-238.
41. Stiegler, *Technics and Time 1*, 236.
42. The reference here to Georges Bernanos' phrase, "Oh miracle of empty hands," from his 1936 novel *Dairy of a Country Priest*, is intentional, but without necessarily invoking the theological context in which it appears in the novel.

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About the author

Tom Gunning is Edwin A. and Betty L. Bergman Distinguished Service Professor at the University of Chicago. He works on early cinema, film theory, and the culture of modernity. Major works include the books *The Films of Fritz Lang: Allegories of Vision and Modernity* (2000), *D. W. Griffith and the Origins of American Narrative Film: The Early Years at Biograph* (1991) and over a hundred essays including: "The Art of Succession: Reading Writing and Watching Comics" (2014); "An Aesthetic of Astonishment: Early Film and the [In]Credulous Spectator" (1989) and "The Cinema of Attractions: Early Film, Its Spectator and the Avant-Garde" (1986). He received a Mellon Distinguished Achievement Award (2009), a Guggenheim Fellowship (1998) and is a member of the American Academy of arts and sciences.

9. Can We Have the Cave and Leave It Too? On the Meaning of Cinema as Technology

Vinzenz Hediger

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Abstract
The debate about technology in film and media studies, as in other disciplines, oscillates between techno-determinism and social constructivism. For techno-determinists, technology and its development drive the history of media, while for social constructivists, technology can only be understood by way of the social forces and dynamics that produce and shape them. This contribution argues that these alternatives should be understood as two facets of what we might call Plato's uncertainty principle. Plato's allegory of the cave illustrates, among other things, a basic indeterminacy in our understanding of technology. You can either focus on the (social) meaning of technology, or on its structure, but the two aspects seem to be mutually exclusive. This contribution argues that a theory of cinema as technology needs to come to terms with this problem.

Keywords: film theory, Plato, philosophy, interdisciplinarity, consciousness

Technology is the infrastructure of cinema.
– André Bazin

Without technological detours, the properly human cannot exist.
– Bruno Latour

One of the most celebrated cuts in the history of cinema occurs near the beginning of Kubrick's *2001 – A Space Odyssey*. A savanna-dwelling hominid has just beaten one of his kin to death with a large bone. In a

flash of recognition of the bone's awesome powers, he throws his weapon up into the air. The camera follows the bone's upward, then downward trajectory. Cut from the rotating, falling bone to a bone-shaped spaceship approaching the camera bottom right against the backdrop of deep space. Bridging several millions of years in human evolution in the blink of an eye, this cut probably marked the longest temporal ellipsis in cinema history until Terrence Malick juxtaposed images of living dinosaurs with images of suburban family life in 1950s America in *The Tree of Life* in 2011. The cut speaks of the marvels of technology: It juxtaposes the ur-scene of the discovery of technology, the moment when the precursors of man turn a found object into a tool which projects the strength of arm and fist into the bone, with the most advanced technology imaginable at the point of the film's making, the technology of space travel. But the cut is in itself a marvel of technology: It foregrounds cinema's capacity for apprehending and compressing vast extensions of space and time, to the point where all of history and the entirety of physical space appear to be at the command of a pair of hands, operating with scissors and duct tape on an editing table in the age of linear editing, or at the command of a pair of hands operating a computer keyboard in the age of non-linear editing, i.e. after 1993.

On an iconographic level, one could argue that Kubrick's famous cut is something of a cinematic correlative of Ernst Haeckel's famous drawings of ontogenetic recapitulation or of the pictograms, which illustrate evolution through a succession of apes and hominids, leading up to *homo sapiens sapiens*, condensing millions of years of evolution into a striking spatial succession from left to right. At the same time, however, Kubrick's cut points to the hands that made it: It is an artifact, created by the human use of a man-made technology.[1] As such, its meaning extends beyond what the two images show which the cut joins, and even beyond the added layer of meaning that the cut creates by joining them. Precisely to the extent that it is a celebration of cinema itself, the cut raises the question of the larger purpose of cinema as technology. Montage may be the essence of cinema, as Eisenstein suggests. But Kubrick's cut raises not just a question of what makes cinema a distinctive form of art. Rather, it raises question of what it means to operate a technology, which symbolically commands space, time, and movement.

Now there can be little debate that alongside photography and television, cinema is the dominant technical image medium of the twentieth and twenty-first centuries.[2] Yet, a point can be made that cinema as technology remains an understudied topic. To account for the technological aspect of cinema, film studies has largely borrowed its approach from art history:

image, editing, sound, color, special effects have all been thoroughly studied under the rubric of cinematic techniques, i.e. as technologies for the production of art works analogous to the various techniques of painting, sculpture and the other visual arts. Cinema as technology first became a topic within the framework of apparatus theory in the 1970s. As part of an Althusserian critique of ideology and through the lens of Platonian model of the cave, apparatus theory framed cinema as a technology of illusion, which wreaks ideological havoc behind our backs and which it is the task of film theory, as well as critical film practice, to reveal and deconstruct. Yet, even in the face of the onslaught of both critical theory and critical film practice, cinema has proven to be resilient: Revealing the apparatus, it seems, only hardens the fascination, and a critique of ideology that focuses on cinema as a technology of illusion seems to have about the same long-term impact as a making-of documentary, albeit without the short-term benefits in terms of viewing pleasure.[3] To understand what kind of technology cinema is, to understand the meaning of cinema as technology and to understand how this meaning matters to our understanding of cinema, seems to require a different approach.

As paleoanthropologist Stanley Amborse puts it, Kubrick's cut raises a specific question concerning technology: "What happened between the first tool use by our ape ancestors and the first complex projectile launched into flight with another tool?"[4] More specifically, the cut juxtaposes two stages of human and technological development and links human development to technology. At one level, the scene appears to suggest that human history is a history of aggression, enhanced by technology. Yet, not just in appearance, the hominids at the beginning are very different from the humans that travel through space in the later parts of the film. Technology, Kubrick's cut also suggests, is the way through which hominids evolve into humans. In that sense, the humans that appear in the film after the cut are not just users of technology: Technology defines what it means to be human. The first reading, which connects human development with aggression and tool-based predation, aligns with a pessimist strain of philosophical anthropology.[5] The second reading, which connects human evolution not just with predation and tool use, but with creativity, aligns with a line of thought that runs from the philosophy of technology from the nineteenth century through today's Science and Technology Studies (STS), with support from an important strain of twentieth century paleoanthropology.

To address the question of cinema as technology, I want to follow through on the second reading. I want to start from the assumption that to understand the "properly human," it is important to follow the technological

detours that lead to it, and that, conversely, to understand technology, we need to read it as a detour towards the human. In that sense, the meaning of cinema as technology lies in the way it shapes and makes what we call the human possible. Raising the question of cinema as technology thus leads us from the field of film and media theory to that of the philosophy of technology, and from aesthetics to epistemology and anthropology, before we can return to film theory.

In what follows, I want to first recapitulate how Film Studies has addressed the question of technology, both in technological and economic histories of cinema. I will then turn to apparatus theory and what we might call the epistemological paradox of Plato's cave, i.e. the fact that in addressing technology, film and media theory – or, more specifically, apparatus theory and Kittlerian media theory – appear to be facing a kind of uncertainty principle, according to which we can either focus on technology or meaning, but never on both simultaneously, thus forever missing out on the meaning of cinema as technology. In my final section, I will draw on the philosophy of technology and science and technology studies to propose a resolution of this paradox.

From Cinematic Technique to Cinema as Technology

Cinema is not only the most important technical image medium of the twentieth and twenty-first centuries alongside still photography and television. Cinema counts among the most important advancements in communications and media technology, or technology *tout court*, of the second half of the nineteenth century – alongside the telephone, the typewriter, the typesetting machine, cheap, industrially produced paper, the automobile, the airplane and dynamite. Film and cultural historians have extensively explored cinema's relationship to modernity.[6] If we agree with historian John Darwin that "the best test for modernity might be the extent to which, in any given society, resources and people could be mobilized for a task, and redeployed continuously as new needs arose or new pressures were felt,"[7] then we can argue that cinema, a mobile medium of moving images that mobilizes concepts and ideas, and in their wake, goods and people, on a global scale, is indeed a genuinely modern medium. In that sense, recent efforts to expand the scope of cinema studies to include the study of media infrastructures, as well as expansions of cinema history towards a wider archaeology of media, point in the right direction:[8] cinema has a place in a broader history of modern logistics and communication technologies.

Yet, if we were to compile a list of the most important technological innovations of the last two centuries, only the most ardent *cinéphile* would dare to rank cinema at, or even near, the top of the list. Film studies was founded on an emotional bond known as cinephilia. Film scholars, with a confidence that only love can inspire, routinely overestimate the overall importance of their object of study. More sober minds would probably choose the computer instead. This is quite understandable, particularly if you consider how information technology has changed not only the way we work, but also the way we live over the last twenty years. But then, as the Czech-Canadian historian of technology Vaclav Smil argues, the most important innovation of the twentieth century is not the computer at all. Rather, it is the Ammonium-Nitrate synthesis, i.e. industrially produced artificial fertilizer, invented by the Jewish German chemist and Nobel laureate Fritz Haber with Carl Bosch.[9] Malthus' most dire predictions would have been proven right in the twentieth century without the benefits of the Haber-Bosch synthesis. We would only be able to feed one billion people, rather than seven billion and counting. If we hold on to the notion that not letting people starve is important, then being able to use ammonium nitrate is, relatively speaking, of more value than owning the latest version of the iPad.

Cinema, as an isolated technology, is even more insignificant by comparison than the computer. Nonetheless, cinema represents a paradigmatic case of technological innovation. Like the automobile, the cinema is an assemblage, a recombination of preexisting technologies. A film projector combines photography on a celluloid support with the light bulb, lenses and a mechanical transportation system borrowing and refining elements from textile industry technology; a film camera combines the same elements, relying on natural or artificial pro-filmic light sources in the place of the light bulb. As George Steiner argues for artistic creation, "all human constructs are combinatorial": "Performative novelties – acrylic paint, the neon tube, the saxophone in its time, electronic music today – obscure this fundamental truth. What they 'make new' is the old recombined, differently hybrid."[10] Similarly, in his 'Theory of Economic Development', Joseph Schumpeter distinguishes between five types of innovation – the creation of new goods, new methods of production, new markets, new sources of raw materials and new modes of organization – all of which are essentially re-combinations of pre-existing elements.[11] The innovation of cinema starts off with the creation of new goods – the experience of motions pictures – and new methods of production.[12] Roughly a decade after the first two steps, the creation of new markets and new modes of organization

pave the way for cinema's transition to a major industry. Technology is the driving force at the outset and remains a key element throughout the later steps of cinema's innovation process.

From a point of view of business history, cinema history can be divided into three main periods:

– From 1894-1895 to the early 1910s, cinema is primarily a *technology industry*, focused on the development and exploitation of patents for cameras, projectors and various other elements of moving image technology. The creation of new products and new methods of organization constitutes innovation in this period. Prior to the World War I, two French technology corporations, Pathé and Gaumont dominate the world market and fight it out with their competitors in North American markets, with Pathé joining the Trust in 1908, a short-lived joint corporation of former competitors with the aim of exploiting a pool of patents to the benefit of all members.
– From 1907 onwards, screenings in dedicated spaces such as nickelodeons replace ambulatory modes of exhibition as the default form of cinematic spectacle. In the following years, the consumption of footage soars, particularly with the passage to the feature film as the standard format of film production and distribution and the passage to large movie palaces as the default mode of exhibition, indicating an exponential growth in the production of films. The creation of dedicated screening venues thus leads to the discovery of new markets. Yet, the main focus of business activity in the film industry shifts from technology not to film production, but to real estate, i.e. to owning and running exhibition facilities. The control of real estate paves the way for the film industry's transition to big business via an 'escalation of quality' (Bakker), with movie theaters serving as collateral for the bank loans needed to pay for the soaring production and distribution cost of feature films.[13] As a consequence, both in terms of its financial and organizational patterns, the film industry of the classical Hollywood period operates as a *cinema industry*, with the combination of the control of downtown first run theaters and national and international distribution networks securing control of the market for the major studios. More than 90 per ceny of all investments in the American film industry from the mid-1910s through the late 1940s are in real estate; the headquarters of the main film corporations are all in New York, from where 70 per cent of movie theaters then operating in the US can be reached with a local phone call; and the so-called Hollywood studios basically operate as subcontractors for large cinema chains. The transition from the early

phase of dedicated screening venues to the major Hollywood studios is mostly a matter of the creation of new forms of organization.

– When the Paramount Consent Decree from 1948 forces the major film corporations to divest, they chose to get out of the real estate business and sell of their cinema chains, retaining their production facilities and distribution arms instead. Thus, the film industry becomes a *copyright industry*, shifting its focus from the ownership and operation of exhibition facilities to the production and exploitation of copyrighted materials. Some studios re-entered the cinema market with partial ownership agreements in cinema chains after the Reagan administration signaled that it would no longer enforce the Paramount Decree in the 1980s.[14] Others, like Columbia, which is a subsidiary of Sony, and Universal, which was, for a time in the 1990s, a subsidiary of Matsushita, sought synergies with technology corporations, reinstating the pre-World War I Pathé model on a larger scale. As the fate of the Matushita-Universal alliance shows, the results were mostly disappointing. The core business of the film industry is now the production of films, i.e. copyrighted material with a potentially unlimited commercial lifespan and territorial reach. Over the last four decades, the copyright industry model has been very successful largely because the creation of new screening and distribution technologies, from the VCR to DVD and streaming, has in turn led to the creation of new markets, to the point where theatrical revenue now makes up only about 25 per cent of the revenue of an average Hollywood film, with the rest coming from so-called ancillary markets, i.e. subsequent release windows.[15]

Throughout this history, the basic recording and delivery technologies for moving images remain remarkably stable. 35mm, the format favored by Edison,[16] became the world standard with advent of dedicated screening venues at the end of the 1900s both in the US and in Europe.[17] Twenty-four frames per second became the standard rate of projection throughout the world with the introduction of sound.[18] 35mm at 24 frames per section proved to be one of the most durable technological standards in communication technology until it was phased out and replaced by digital projection in the 2010s. Digital cameras were modeled on the 24 per second frame rate when they were first developed in the 1990s and early 2000s to accord with the then-still dominant format of distribution, the 35mm/24 frames per second film print. Most technological advancements throughout cinema's history, from widescreen formats to stereo, Dolby and Dolby surround sound

systems and, more recently, CGI and 3D technologies, left the recording and delivery standard of 35mm/24 frames per second unaltered. In that sense, they remained secondary to the basic technology of cinema, and the most important innovations after the introduction of sound were organizational rather than technological. This pertains even to home video technologies, which remained secondary to the recording and delivery standard in the sense that they served mostly as delivery technologies operating with reduction formats and transpositions of 35mm prints. Much like the automotive industry, which has largely relied on the mass production of some combination of internal combustion engine and a four-wheel chassis for the last one hundred years, cinema has operated with a relatively stable technological infrastructure for most of its history.

But if the infrastructure has been stable, and if technology is indeed, as André Bazin suggests, the infrastructure of cinema, the secondary innovations of cinema technology – sound, color, formats, optics, special effects – had an enormous impact on the development of cinema as an art form. "Every change of real importance," Bazin argues, "which enriches our cinematic heritage" (i.e. that enriches the history of film as an art form) is indeed "tied to technology."[19] Cinema as an art form is thoroughly technological. You can draw without a paper or a pencil, you can make music without an instrument, you can dance without shoes, but you cannot make and show a film without a camera and a projector. Even Alexander McCall's 'Light Describing a Cone' needs a projector. Accordingly, as much as any historian of art has to address the question of technique and specify whether a given work of art is executed in oil, by pencil, on paper, on canvas, etc., any historian of cinema as an art form needs to address technique, which involves a discussion of cinema's technologies. And this is indeed the main aspect under which cinema technology has been analyzed in the field of film studies: Under the aspect of technology as technique.

Film studies was first established as an interdisciplinary field of study dedicated to the analysis of the aesthetic properties, psychological dynamics and social effects of cinema after World War II in France under the title of 'Filmology'. Powered by the prestige of its founders, which included the dean of French aesthetics, Etienne Souriau, and Henri Wallon, one of the key figures of developmental psychology, filmology established itself at the intersection of philosophy, psychology, and sociology. Despite what turned out to be a series of lasting conceptual contributions to film theory, filmology was transformed by the onslaught of television in the late 1950s and morphed into a form of communication studies focused on TV in the

early 1960s, itself a victim, if you will, of technological innovation.[20] Yet, in the research designs of filmology, the question of technology played at best a marginal role. Issues of technology were discussed in a few articles published in the *Revue internationale de filmologie*, such as a study on the difference between the cinematic and televisual images by Henri Dieuzième, which discussed the specifics of cathode ray tubes and its perceptual and aesthetic properties during broadcasts of theatrical films.[21] When film studies finally emerged as a discipline out of literature departments in the 1960s and 1970s, it primarily focused on film as art and dealt with cinema as a canon of great works bound together by relationships of influence. While works such as Karel Reisz' *The Technique of Film Editing*,[22] which was first published in 1953 and revised in 1968, discussed montage and other aspects of film making as a craft, and while the classics of film theory, from Eisenstein to Epstein, were written by film makers dealing theorizing their artistic practice, cinema technology only became a central concern of film studies within the framework of the "new film history" in the 1970s. The point of David Bordwell's 'historical poetics of film', for instance, was that in order to properly understand a film, one had to be familiar with the techniques employed in its production or creation.[23] Expanding on an understanding of technology as technique established in art history and borrowing from the methodologies of the history of technology, the research paradigm proved to be enormously productive, yielding comprehensive histories of sound,[24] lighting, color,[25] widescreen formats,[26] and digital effects.[27] And while the history of non-linear editing, for instance, remains as yet to be written, it is safe to assume that the paradigm will continue to be productive.[28]

As I argued in the introduction, Kubrick's cut not only creates meaning, but also points to the hand that made it. Cinema technology is about more than its impact on the history of film style. In the introduction to his 1923 work, 'Visible Man', Béla Balázs celebrated the advent of cinema as the dawn of a new 'visual culture' that would do away with the abstractions of print culture, and reverse its harmful spiritual fragmentation.[29] In a different vein, but with a similar grand gesture and sense of history, André Bazin argued in 'The Myth of Total Cinema' that the cinema that we know was merely a transitory technological manifestation of a dream of immersion, which would be perfected as cinema's history went on.[30] Bazin's claim that technology is the infrastructure of cinema can be read to mean that technology shapes technique and, with it, the style and meaning of individual films. But it can also mean that technology contains the meaning of cinema.

Plato's Uncertainty Principle

Technology only became a focus of film studies relatively late, despite the fact that in its first decade, the film industry was a technology industry, and despite the fact that in cinema, style and technique are even more intricately related to technology than in other art forms. This should not surprise us, however. As Bruno Latour argues about technology in general, "once the invention has become an innovation as a result of the slow concretization which is demanded by industry and the market, we end up by being able to count on a unity of action which is so reliable that it becomes invisible."[31] Apple products may be the paradigmatic case of an innovation that obfuscates the invention that made it possible. Their design allows for an intuitive grasp of the device's performance functions without reflecting anything of the underlying unity of action.

The difficulty appears to be further compounded by the fact that the "tools always presuppose a machine, and the machine is social before it is technical" as Jean-Louis Commolli famously argues in his influential essay on the 'Machines of the Visible', first published in the *Cahiers du Cinéma* in 1971. With more than a passing echo of Bazin's 'Myth of total cinema', Comolli claims that the cinema is "born immediately as a social machine, and thus not from the sole invention of it equipment," but from "the anticipation of its *social profitability*." For Comolli, it is "the spectators who invent the cinema":[32] Cinema is born from a "frenzy of the visible" in the second half of the nineteenth century, which is an "effect of the social multiplication of images" and the spatial and geographical extension of the field of vision. The social multiplication of images in turn presupposes the technologies of photography and of printing, of course. But in Comolli's view, technology has no agency, since the "machine is social before it is technical." The social neutralizes the technical: The "frenzy of the visible" marshals technology, but only enlists it as technique. Or, to put it differently, the "frenzy of the visible" consigns technology to the invisible.

But as Latour argues, the apparent invisibility of technology is, in itself "of course, a kind of optical illusion."[33] What if, in fact, the machine is technical before it is social, or what if it is both technical and social at the same time? What, for instance, if the cinema invents its spectators, rather than the other way around? Tales of spectators spooked by life-like representations in paintings abound since antiquity. The story of the spectators, who supposedly ran away from the train at the first screening of 'Entrée d'un train dans la gare de la Ciotat', has a long pedigree. The story is, in fact, a myth, which only appeared about ten years after the first public screening of

Lumière films in Paris. It finds an echo in the so-called rube films, i.e. films in which a naïve spectator falls prey to illusionist powers of cinema, which appear around the same time.[34] In a kind of deferred action, the story, like the rube films, served to retroactively underscore the novelty of cinema and highlight the fact that it was unlike any other art or medium available at the time. To put it in Comolli's terms, the 'founding myth' of cinema, as Martin Loiperdinger and Bernd Elzer call the story, tells a tale of spectators who are not at all prepared to reap the benefits of the social profitability of the new invention. Sometimes, it would seem, the tools build the machine, or exceed the machine that presupposes them. Following Latour's lead, one could speculate that the 'the founding myth of cinema' marks the precise moment when the invention of cinema turns into an innovation, i.e. the moment when a majority of spectators have learned to be "able to count on a unity of action which is so reliable that it becomes invisible."

While Comolli forcefully stresses the primacy of the social over the technical, the question of the balance of the social and the technical haunts the so-called apparatus theory of the 1970s in other quarters as well. In an essay entitled 'Ideological Effects of the Basic Cinematographic Apparatus', first published in French in 1970, one year before Comollis 'Machines of the Visible', and translated into English in 1974, French writer and film theorist Jean-Louis Baudry introduced three metaphors or models for cinema that largely set the terms for the debate in film theory for the next two decades: Freud's concept of the psychic apparatus, Lacan's mirror stage and Plato's cave.

Having invoked Freud's concept of the psychic apparatus in the essay's title, Baudry cites Plato's allegory of the cave, which Socrates introduces in *The Republic* (514a-520a) to discuss the "effect of education and the lack of it in our nature," in a half-sentence in Baudry's essay, which, in turn, immediately precedes the author's introduction of Lacan's mirror stage:

> The arrangement of the different elements – projector, darkened hall, screen – in addition to reproducing in a striking way the mise-en-scene of Plato's cave (prototypical set for all transcendence and the topological model of idealism) reconstructs the situation necessary to the release of the «mirror stage» discovered by Lacan.[35]

The first thing to note about this passage is that Lacan did not discover the mirror stage. Henri Wallon did, the French developmental psychologist who was, as mentioned above, a key figure of the Filmology movement in the late 1940s. Wallon first described the process in which a child, placed

in front of a mirror, "gradually comes to distinguish his own body from its reflected image," in 1931, five years before Lacan published his famous paper. Elisabeth Rudinesco, a historian of psychoanalysis and biographer of Lacan, argues that Wallon's contribution has become part of an "obliterated archive" of the various historical layers of the concept of the mirror stage.[36] Yet, at some point, some concepts take on a life of their own, sometimes because they explain almost too much. One of the standard protocols of scientific research progresses from description to analysis and explanation: the researcher defines an object of study according to the terms of her research design, proceeds to analyze the object in terms of its component elements and functional logic, and develops a theory to explain the phenomenon. The definition of the object of study, however, depends on theoretical assumptions that are already part of the research design,[37] as well as on certain "styles of thought" and the social logic of "thought collectives," as Ludwig Fleck proposes to call it.[38] In the humanities, which I would contend operate much more along similar lines as the natural sciences in terms of "styles of thought" and "thought collectives" than we generally assume, certain theoretical concepts come to define and dominate entire research paradigms over certain time periods. Such concepts operate not only as standard assumptions baked into research designs, but tend to reverse the procedural flow from description to analysis and explanation, to the point where the theoretical explanation takes precedence over the object. One could argue that the concept of 'mirror neurons' was one the latest examples of a theory that took on a life of its own as an explanation in search of an object.[39] Lacan's concept of the mirror stage, however, found much greater resonance, and its career in the humanities would provide ample material for a historical study. Baudry's essay marks the point of entry of Lacan's concept into film theory. Baudry combines the mirror stage with the Freudian concept of the apparatus and Plato's cave to create a heuristic that promises to unlock the psychological and, by extension, ideological dynamics of cinema. The common thread that unites the three models and metaphors is that in all three, the element of technology provides the template that explains cinema: the technical metaphor of the apparatus in Freud, the device of the mirror in Lacan, and the machinery to project shadows on the cave's wall in Plato. In that sense, the balance of object and theory, or phenomenon and explanation, in Baudry's toolbox, hangs on the question of technology. Or, to put it differently, rather than assuming a subordinate role in a pre-existing social machine, technology seems to provide the pivot around which the explanation of the dynamics of the social machine evolves.

Freud first introduces the technical metaphor of the "apparatus" in his 'Entwurf einer Psychologie' from 1895, to describe a key juncture of the neuronal processes in the perceptual system. In the seventh chapter of the *Interpretation of Dreams* from 1900, the term "psychic apparatus" describes the overall unit of the three systems of consciousness, pre-consciousness, and sub-consciousness. The articulation and functional interaction of these three systems allows Freud to locate any given psychological event topically, i.e. with regards to the location in the apparatus where the event primarily takes place; dynamically, i.e. as a form of conflict, usually between conscious norms and subconscious desires; and energetically, i.e. in terms of the "psychic energy" mobilized in and for the event. This meta-psychological model of the human psyche as apparatus, as a machine powered by psychic energy, allows the therapist to operate as a mechanic of latent meaning, analyzing the output of the machine – dreams, hallucinations, jokes, slips and all kinds of symptoms – in terms of the mechanisms and dynamics of their production, in particular displacement, transfer, condensation. And while the various outputs of the machine may not make sense on the surface – what makes them interesting, in fact, is precisely the way in which they are often aggressively nonsensical and subvert the established order of meaning – the work of the mechanic of latent meaning is aided by the fact that the subconscious is fully determinate, as Freud argues: Every bit of superficial nonsense can be counted on to be an expression, however creatively contorted, of a perfectly coherent latent meaning.

What makes Freud's model attractive for film theorists is the way in which psychic production interacts with perception. In the psychic apparatus, perception is a flow of information from consciousness to sub-consciousness, while hallucination and dream in particular appear as a form of psychic projection from the sub-conscious to conscious system. Perception is topical progression, psychic production is topical regression, i.e. a reversal of the flow of information, meaning and energy inside the psychic apparatus. In that sense, the psychic apparatus, like the cinema, is an arrangement of elements designed for heightened perception and the production of multi-layered meanings by means of projection. Hence, the cinema, in analogy to the psyche, may be described as a cinematic apparatus.

The analogy between Freud's psychic apparatus and the projection apparatus of cinema may have been apparent to an earlier generation of film critics and film theorists versed in psychoanalysis.[40] Writing in the late 1940s and early 1950s, Cesare Musatti, the pioneer of Freudian psychoanalysis in Italy, was the first theorist to fully explore the analogy of

psychoanalysis and cinema.[41] But it was the political turn of film theory in the early 1970s that brought the potential of Freud's concept of the apparatus to the fore. To film theorists like Baudry, the analogy between psychic and cinematic apparatus promised to bequeath to film theory the full heuristic fecundity and critical incisiveness of Freud's theory of the dynamic interaction between subconscious desires and social norms. If dreams, jokes, slips and symptoms could be understood as compromises between desires and norms by analyzing the workings of the psychic apparatus, then surely the ideological compromises of cinema could be understood by analyzing the operations of the cinematic apparatus. In other words, the analogy promised to offer a critical handle and a sophisticated methodology for the analysis of the "ideological effects" of cinema.

Lacan's 1936 essay 'The Mirror Stage as Formative of the Function of the I' carried a similar promise at the point of Baudry's writing.[42] For Lacan, the toddler's discovery of her mirror image is the foundational moment of identity formation: From the recognition of the mirror image, personal identity emerges as an imaginary relationship to a structurally elusive reflection of oneself, forever scarred by a fundamental rift, which in itself is beyond representation. Again, by analogy, the mirror stage provided a model for the cinema spectator's imaginary relationship to the characters on screen. As in the case of the psychic apparatus, the analogy serves not only a heuristic and explanatory purpose. It also has an experiential dimension. The cinematic apparatus sets in motion a topic regression in the psychic apparatus, which leads the spectator to treat the image on the screen as a "hallucination coming from the outside," a "*hallucination d'autrui*," as Christian Metz called it.[43] But, in order for the topic regression to occur, the spectator must be positioned in a semi-somnabulic position, a position of "*sous-motricité et sur-perception*," of reduced motility and heightened perception, just like the toddler in front of the mirror. The experience of cinema is not only analogous to the experience of the mirror stage, it builds on a reiteration of that experience. As Baudry writes, the "arrangement of elements" of projector, screen and cinema hall "reconstructs the situation necessary to release" the mirror stage. Through an operation not of topical, but of genealogical regression, i.e. a temporary regression to the mirror-stage of our individual psychological history, the cinematic apparatus induces us to re-live the euphoria of the discovery of the image of the self in the mirror, reiterating and re-entrapping us in the imaginary fullness of our relationship to ourselves, while deferring the affective charge of that fullness onto our relationship to the characters on screen. Like the mirror, the toddler and the mother holding her up to the mirror image and

confirming her identification of her reflection with herself, the projector, the hall and the screen form a "dispositive", an arrangement of technologies with psychological dispositions to produce certain mental effects.

With a term from French anthropologist André Leroi-Gourhan, the "arrangement of elements" that reconstruct the situation necessary to "release" the mirror stage can be described as a "*chaîne opératoire,*" an operational sequence of technologies and social acts in the production of artifacts. Operational sequences are programs that "are organized in sequences of stereotyped gestures whose repetition ensures the individual's normal balance within the social environment and his or her own psychological comfort within the group." In the case of cinema, the artifacts are the fleeting mental effects produced by the apparatus. Through recursion and reiteration, these ephemeral effects gain the consistency of patterns, to the point of "securing the individual's integration in society," which depends "upon the smooth performance of these operational sequence in normal life."[44] To the extent that cinema technology provides the basis for the "smooth performance" of the operational sequence and helps to secure "the individual's integration in society," the analysis of the technological base of cinema is part of a critique of ideology.

As if the model of the psychic apparatus and the operational sequence of the mirror setting were not enough, Baudry adds Plato's Cave to his box of analytical tools.

If the arrangement of projector, hall and screen "reconstructs the situation necessary to the release of the 'mirror stage' discovered by Lacan," Baudry writes, it does so "in addition to reproducing in a striking way the mise-en-scene of Plato's cave." The cinematic apparatus as an extension of the psychic apparatus offers to the film theorist a way to disentangle the complex relationship between the mechanics of desire and the production of meaning in cinema. The cinematic apparatus as a device of restaging and "releasing" the mirror stage provides a handle on the genealogy of cinematic subjectivity. Adding yet another layer of analysis, Plato's Cave highlights for Baudry how cinema is complicit in perpetuating transcendentalist and idealist epistemologies. According to Baudry, Plato's Cave is the "prototypical set for all transcendence and the topological model of idealism." The mirror stage provides a key to the genealogy of (cinematic) subjectivity; Plato's Cave provides a model for a fully formed version of that subjectivity. If modern philosophy from Descartes to Husserl posits the transcendental subject as the foundation of knowledge, the analogy between cinema and Plato's cave reveals how cinema is complicit in perpetuating transcendentalist and idealist epistemologies of the subject, and thus an ideology of the sovereign

gaze as the nadir of the world. Accordingly, the task of the critical film theorist is to lead the spectator out of the cave and reveal the dispositive that held her in its thrall.

Pointing to the technological base of cinema, then, is the critical gesture par excellence of the early 1970s, both in the film theory and in film practice. As Peter Wollen pointed out at the time, there was a debate whether Godard's Brechtian gestures of showing the apparatus should count as a radical critique, or whether only the anti-illusionist aesthetics of structural film and similar forms of experimental cinema deserved that label.[45] But far from stressing the primacy of the social machine over technology, both avant-gardes and Baudry's strain of apparatus theory operate on the assumption that the best way to deconstruct the social machine is to point to the agency of technology.

Along similar lines, German media theory, as it emerged with Friedrich Kittler's two books *Discourse Networks 1800-1900* (1985)[46] and *Gramophone, Film, Typewriter* (1986)[47] roughly ten years after apparatus theory, argues that what really matters in communication is its materiality. Moving on from eighteenth- and nineteenth-century literature and late nineteenth-century communication technology in the late 1980s, Kittler ultimately focuses on the computer and proposes a grand narrative, which we can sum up as 'Techno-Hegelianism'. It is a philosophy of history in which Hegel is not only turned from his head to his feet, but in which the feet are replaced with the Heideggerian '*Gestell der Technik*'. Taking the place of Hegel's spirit, media technology moves history forward, and the computer, the medium which can represent every other medium in binary code, is the hardware equivalent of the Hegelian '*Weltgeist*'.

In terms of its analytical approach, however, Kittlerian media theory remains firmly anchored within the framework of Plato's cave. Further exacerbating the tension between the technical base and its illusionary effect, Kittlerian media theory operates under the assumption of what we may call Plato's uncertainty principle: You can either have the cave, or leave it, i.e. you can either fixate on the illusionary effects of the dispositive or focus on the dispositive, but you cannot have both at the same time. You cannot have the cave and leave it too. For Kittler and his followers, prudence dictates a focus on hardware rather than software. As a consequence, Kittlerian media theory and media archaeology has largely focused on hardware histories rather than modes of expression and histories of form for the last three decades.[48]

As for film theory and critical film practice, the social machine of cinema proved to be quite resistant to their impact. Brechtian reflexivity and the anti-illusionist aesthetic of experimental cinema quickly became markers

of style, rather than effective political strategies, and apparatus theory was eventually superseded, among others, by Deleuzian film theory. Deleuze offered a critique psycho-semiotic film theory and the inherent transcendentalism of the Lacanian concept of the gaze, which he proposed to replace with the immanence of the image, an offer which a new generation of film theorists gladly accepted.

From a Kittlerian point of view, one could argue that the relative political failure of the two avant-gardes and apparatus theory serves to underscore the pertinence of Plato's uncertainty principle. Revelations of the apparatus in film remain on the side of the illusionary effects of the apparatus, and one would have to do away with film altogether, as Kittler does in *Gramophone, Film, Typewriter*, which is not at all a book about cinema, in order to really leave the cave. From a psychoanalytic point of view, on the other hand, one could argue that Plato's uncertainty principle can be accommodated, and resolved, in a structure of '*Verneinung*', of negation: We can, in fact, simultaneously acknowledge and deny the apparatus; we can know about the apparatus and still fall prey to its illusionary effects.[49] Through the logic of negation, we can have the cave and leave it, too. In fact, revealing the apparatus seems to strengthen, rather than break, the power of cinematic illusion. It is no coincidence that 'making of' films first appear in the early 1910s, at the point of what Tom Gunning proposes to call 'narrative integration', i.e. the creation of closed, coherent fictional worlds in narrative cinema.[50] Rather than offer a radical critique of the apparatus, Brechtian gestures of reflexivity appear to share an operational logic with 'making of' films.

In terms of our understanding of cinema as technology, however, both Plato's uncertainty principle and the logic of negation lead into an aporia: While Plato's uncertainty principle forces us to choose between technology and cinema, negation plays out as a 'Fort-Da-Spiel' of sorts, a constant oscillation between illusion and revelation. Neither of which, in theoretical terms, are entirely satisfactory explanations of cinema as technology.

In order to move beyond a merely instrumental conception of cinema's technological infrastructure, as well beyond the conundrums of both Plato's uncertainty principle and the logic of negation, we can draw on some insights from the philosophy of technology.

Cinema and the Body Envy of Artificial Intelligence

Technology impact assessment is one of the main areas of the philosophy of technology. Developed largely in response to the emergence of nuclear

technology in the wake of World War II, technology impact assessment evaluates what it means, both pragmatically and ethically, to live with technologies with the potential to transform human existence. Far from assuming that a new technology is merely a tool of a pre-existing social machine, then, technology impact assessment assumes that new technologies may have an agency of their own, with an impact on human existence that may well exceed their stated purpose.[51] Heidegger's notion of technology as '*Entbergung*', of techne as a progressive unconcealment of physis, can be read in the same context. Heidegger argues that, far from merely being a tool, technology transforms the world by imposing a worldview dominated by question of utility and utilization. Yet, quoting Hölderlin's line "*Wo aber Gefahr ist, wächst das Rettende auch*" (Where the danger is, the saving powers will grow as well), Heidegger suggests that there is no outside to technology, from which it can be contained and brought under control. Rather, the saving powers must come from within the '*Gestell*' of technology.[52] Philosophical argument can take many forms. Literature is among them, as Diderot's *Jacques le Fataliste et son Maître* and other eighteenth-century French works of philosophy illustrate.[53] A case can be made that cinema, too, can carry forward a philosophical argument, and particularly an argument about technology. For instance, we can argue that films like Kubrick's *2001*, Spielberg's *Artificial Intelligence* (2001) or more recently Spike Jonze's *Her* (2013), engage in a kind of technology impact assessment which takes the form of casuistic narratives. Taking the case of a man who writes love letters for a living, for instance, *Her* explores what it means to fall in love with an operating system, while *Artificial Intelligence* tells the story of a humanoid, who develops a desire to become human, while the protagonist of *2001* is a computer who takes over a space mission and turns into a mortal threat for the crew. All three narratives are driven by, and are about, the agency of technology, and they share another common thread: In all three narratives, the artificial intelligence units develop what we might call body envy, i.e. a desire for the embodied existence of human beings. Precisely at the point where it assumes autonomous agency in its most anthropomorphous shape, namely as artificial intelligence, technology projects itself back unto its creators. Highlighting its autonomous agency as well its limitations, the projective bond to embodied human existence defines technology.

This projective bond exactly mirrors one of the main concerns of the philosophy of technology since the nineteenth century. Philosophers from Ernst Kapp[54] to Gilbert Simondon[55] and Bruno Latour,[56] along with paleo-anthropologists such as John F. Hoffecker,[57] have argued that what we call 'human' cannot be thought independently of technology, and that the human

actually emerges from technology, its development and acquisition. Other thinkers have defined technologies either as supplements and substitutes that compensate for a genetic, structural lack in human beings (the so-called theory of the *Mängelwesen*; Freud, Gehlen), or as 'extensions of man' that enhance a pre-existing repertoire of what it means to be a human being (McLuhan). Whether they define technology as supplement or extension, the argument assumes a pre-existing human nature, to which technology is an add-on, serving pre-existing human ends, or making possible the attainment of human ends that would not be attainable without them. However, as Derrida argued, the supplement is always more than merely an add-on. Rather, it is intricately tied to and determines that to which it is a supplement.[58] In a similar reversal of the hierarchy of supplement and supplemented, thinkers like Kapp argue that tools and technology are essential, rather than accidental, to humanity. Kapp's notion of technology as 'organ projection', for instance, suggests that a tool is not merely an extension or a substitute. Rather, it carries with it an unconscious knowledge about what a human being is and can be, a knowledge that becomes conscious, and, in fact, turns into a driver of self-consciousness, through usage of the tool and reflection on its properties. Similarly, and drawing on Kapp, Hoffecker argues that the emergence of the human mind is closely tied to the development of tools. From the fossile record, Hoffecker infers that technology, rather than language and symbols, "is the means by which the mind engages the external world" and that tools are "externalized thoughts," i.e. mental (rather than just organ) projections.[59] It is important to note that neither Kapp, nor Hoffecker engage in technological determinism. For Hoffecker, technology does not determine the human. Nor is man just a tool-making animal, a definition inherited from antiquity, which no longer holds in the light of recent insights into learning and group knowledge in non-human primates anyways. Rather, what constitutes the 'properly human' is the capacity to shape technology through a process of infinite recombination of pre-existing elements.[60]

As we have seen, cinema is an exemplary case of the recombination of pre-existing elements. The question is what kind of a detour to the properly human cinema is, and of what, if anything, it is a projection. As argued above, what I propose to call the body envy of the artificial intelligence units in *2001*, *AI* and *Her*, mirrors the projective bond stipulated by Kapp and others. Certainly, in those films agency of technology cannot be understood, and, in fact, technology cannot understand itself, independently of human existence. But, I would argue the body envy of the AI units offers a clue for an understanding of cinema as technology more generally speaking.

While Deleuze's critique of apparatus theory focused on the continuing transcendentalism of semio-psychoanalytical film theory, another powerful critique of the then dominant paradigm of film theory in the early 1990s focused on embodiment and experience. In the introduction to *The Address of the Eye. A Phenomenology of Film Experience* from 1992, Vivian Sobchack explicitly positions herself against apparatus theory, arguing that Lacanian accounts miss out on the lived-body experience of cinema.[61] More recently, drawing on Sobchack and philosophical aesthetics, Christiane Voss proposed the concept of the spectator as '*Leihkörper*', or surrogate body of film.[62] While Sobchack argues that the film has a body of its own, Voss refines the argument and suggests that the film embodies itself in the body of the spectator, which thus becomes the surrogate or 'loan' body of the film. Rather than the mirror stage or Plato's cave, the scene in *Her*, in which the artificial intelligence unit wants to make love to the protagonist and hires a female human stand-in as a surrogate body, would provide a metaphor or model for the cinema. And it is precisely the failure of that experiment, the '*rendez-vous manqué*' between the two bodies, which speaks to the connection between human existence and cinema as technology. Where Christian Metz speaks of a '*rendez-vous manqué*' between the voyeur and the exhibitionist,[63] the actual '*rendez-vous*' of cinema – which is both '*manqué*' and successful, and which is successful to the extent that it never succeeds entirely – is that between the spectator and the technology of film, onto which, and into which, the spectator projects her body. In that sense, the spectators of the founding myth of cinema fail to understand that the film only wants to temporarily lodge itself, and not attack their bodies, and the rubes of the 'rube films' fail to understand that the body on screen is not another body, but a technological projection of their own.

Neither Sobchack, nor Voss address the question of technology directly. However, their arguments offer a framework that allows us to think of cinema itself as a form of artificial intelligence, a technological unit, which engages us through a projective bond. In his short 1940 novel *The Invention of Morel*, which was one of the main inspirations for Alain Resnais' and Alain Robbe-Grillet's *L'année dernière à Marienbad*, Adolfo Bioy Casares imagines an island inhabited by people who turned out to be filmed recordings of themselves at a given moment in their life's history.[64] The entire island is an ingenious mechanism of projection, built to sustain itself autonomously on natural resources. The protagonist ends up on the island by accident. Enthralled by the projections, he falls in love with a woman, almost loses his mind over her lack of responsiveness and the sense of being trapped in an eternal loop of past experience, and ends up destroying the entire

mechanism. Bioy Casares, in other words, develops the uncanny scenario of cinema as a technology with truly autonomous agency, a cinema without address, in which the spectator has no place. It is a scenario, which helps us understand cinema as technology by marking the opposite pole of an understanding of cinema in which technology has no agency. In between a cinema, in which the social comes before the technical and in which technology is merely the tool of a pre-existing social machine, and a cinema which acts autonomously and has no place for the spectator, lies a cinema in which the projected body on the screen is the technological detour through which the properly human comes into existence.

Notes

1. See also the contribution of Benoît Turquety in this volume.
2. For the concept of technical image, see Vilém Flusser, *Into the Universe of Technical Images* (Minneapolis, MN: Minnesota University Press, 2011).
3. Hediger, 'Spass an harter Arbeit'.
4. Ambrose, 'Paleolithic Technology'.
5. For a differentiated discussion see Travis Rayne Pickering. *Rough and Tumble. Aggression, Hunting and Human Evolution* (Berkeley, CA: California University Press, 2003).
6. Charney and Schwartz, *Cinema and the Invention of Modern Life*; Casetti, *Eye of the Century*; Hansen, *Babel and Babylon*; Singer, *Melodrama and Modernity*.
7. Darwin, *After Tamerlane*, 27.
8. Parks and Starosielski, *Signal Traffic*; Starosielski, *The Undersea Network*; Thomas Elsaesser. *Film History as Media Archaeology*.
9. Smil, *Enriching the Earth*.
10. Steiner, *Grammars of Creation*, 156.
11. Schumpeter, *Theory of Economic Development*, 66.
12. See also Turquety, Benoît. *Inventer le cinéma. Épistémologie: problèmes, machines* (Lausanne: L'Âge d'homme, 2014).
13. Bakker, 'The decline and fall of the European film industry'.
14. Holt, *Empires of Entertainment*.
15. Vogel, *Entertainment Industry Economics*.
16. Belton, 'The Origins of 35mm Film as Standard'.
17. Burrows, 'When Britain Tried to Join Europe'.
18. Read and Meyer, *The Restoration of Motion Picture Film*, 26.
19. Bazin, 'William Wyler', 53.
20. Albera and Lefebvre, *La filmologie*.
21. Dieuzeide, 'Quelques problèmes'.
22. Reisz, *The Technique of Film Editing*.

23. Bordwell, *Poetics of Cinema*.
24. Weis and Belton, *Film Sound*.
25. Higgins, *Harnessing the Technicolor Rainbow*. See also Barbara Flückiger. 'Timeline of Historical Film Colors', http://zauberklang.ch/filmcolors/.
26. Belton, *Wide Screen Cinema*.
27. Flückiger, *Visual Effects*.
28. Lefebvre & Furstenau, 'Digital Editing and Montage'.
29. Balázs, *Early Film Theory*.
30. Bazin, André. 'The Myth of Total Cinema'.
31. Latour, 'Morality and Technology', 252.
32. Comolli, 'Machines of the Visible', 122. See also Jean-Louis Comolli. *Cinema against Spectacle. 'Technology and Ideology' Revisited* (Amsterdam University Press, 2015).
33. Latour, 'Morality and Technology', 252.
34. Loiperdinger and Elzer, 'Lumière's Arrival of the Train'.
35. Baudry, 'Ideological Effects', 539.
36. Rudinesco, 'The Mirror Stage', 29.
37. Rheinberger, *Towards a History of Epistemic Things.*
38. Fleck, *Entstehung und Entwicklung einer wissenschaftlichen Tatsache*.
39. Hickok, *The Myth of Mirror Neurons.*
40. Eppensteiner and Sierek, *Der Analytiker im Kino.*
41. Musatti, *Psicoanalsi e vita contemporanea*; Musatti, *Scritti sul cinema*.
42. Lacan, 'The Mirror Stage'.
43. Metz, 'Le film de fiction et son spectateur'.
44. Leroi-Gourhan, *Gesture and Speech*, 232.
45. Wollen, 'The Two Avant-Gardes'.
46. Kittler, *Discourse Networks*.
47. Kittler, *Gramophone, Film, Typewriter*.
48. The most radical proponent of this line of thinking is Wolfgang Ernst and his 'materialist diagrammatics' approach to media archaeology.
49. Mannoni, *Clefs pour l'imaginaire.*
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52. Heidegger, 'The Question Concerning Technology'.
53. Werner, 'Diderot's Great Scroll'.
54. Kapp, Ernst. *Grundlinien einer Philosophie der Technik*.
55. Simondon, *On the Mode of Existence of Technical Objects*.
56. Latour, 'Technology and Morality'.
57. Hoffecker, *Landscape of the Mind.*
58. Derrida, *Of Grammatology.*
59. Hoffecker, *Landscape of the Mind,* 23.
60. *Ibid*., 7.

61. Sobchack, *The Address of the Eye.*
62. Voss, 'Film Experience and the Formation of Illusion. For a full-fledged account see Christiane Voss. *Der Leihkörper. Erkenntnis und Ästhetik der Illusion* (München: Fink, 2013).
63. Metz, 'Le signifiant imaginaire'.
64. Bioy Casares, *The Invention of Morel.*

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About the author

Vinzenz Hediger is Professor of Cinema Studies at Goethe-Universität Frankfurt. His research focuses on film history, the history of film theory and marginal practices of film, ranging from industrial film to the uses of film in scientific research. He is a co-founder of NECS – European Network of Cinema and Media Studies, and the founding editor of the Zeitschrift für Medienwissenschaft. He has co-edited several collections, including *Films that Work: Industrial Film and the Productivity of Media* (2009), *Preserving and Exhibiting Media Art: Challenges and Perspectives* (2013), *Essays zur Filmphilosophie* (2015) and *The State of Post-Cinema: Tracing the Moving Image in the Age of Digital Dissemination* (2016). He is a member of the Mainz Academy of Sciences and Literature and the Academia Europaea.

10. On Viewfinders, Video Assist Systems, and Tape Splicers: Questioning the History of Techniques and Technology in Cinema

Benoît Turquety

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Abstract
This chapter presents two case studies, one on viewfinders and the other on video assist systems, that enable a consideration of the way film techniques and technologies are defined and historicized. Such historiography often turns on the way new technologies are characterized, either in terms of "innovations" or "inventions," which thus create different possible continuities or discontinuities within the historical field. Moreover, identifying salient elements of cinematic machines for historical description requires a parallel investigation of the internal logic of the machine and its procedures at a given time, as well as the technical networks (historical, cultural, economic) to which they belong. Such histories must also include a rethinking of the technicity of gestures involved in the operation of film apparatuses.

Keywords: viewfinders, tape splicers, innovations, Annales School, historiography, film theory

Problems of Historiography

History of Techniques and Technology

'Technical innovation' is a thoroughly and immediately historical notion. Its definition cannot but raise historiographical and theoretical implications: theory of history, theory of technology (as to its very notion as well as to its

relations with society and general history), and, finally, for what concerns us more specifically here, theory of the cinema.

These problems have been considered in the field of general history during the 1920s by Marc Bloch and Lucien Febvre, founders of the *Annales d'histoire économique et sociale* review in 1929. The Annales School deeply transformed the dominant conceptions of the writing of history in twentieth-century French thought.[1] After Marc Bloch got involved in a few polemical exchanges from the mid-1920s onward about the question of the place of techniques in social history, the *Annales* devoted their first thematic issue to this problem, under the title *Les techniques, l'histoire et la vie* ('Techniques, History and Life'). The volume included a long essay by Bloch on the 'Advent and Conquests of the Water Mill', and was introduced by a programmatic text by Febvre, titled 'Réflexions sur l'histoire des techniques' ('Reflections on the History of Techniques'). It opened with these sentences: "Technique: one of those many words whose history hasn't been done. History of techniques: one of those many disciplines that are still entirely to be created – or almost."[2]

The issue as a whole leaves the reader with the strong impression that its contributors are very aware of opening a new field, with the obvious enthusiasm it can arouse, as well as with the urgent need to set the methodological and theoretical prerequisites to the foundation of this new discipline. This new area of history – perhaps the only one to be younger than film history itself as a discipline – has known a slow and still relatively marginal institutionalization, but played an important role in several fields. In France for instance, it has developed within two rather separate intellectual traditions: the first is ethnology, with Marcel Mauss, André Leroi-Gourhan, and others, and the second is historical epistemology, notably through the founding works of Gaston Bachelard and Georges Canguilhem. Other fields have imported these questions, such as sociology (Georges Friedmann, Bruno Latour) or art history (Pierre Francastel). The presence of the history of techniques in the French intellectual field is thus rather complex, remaining apparently subdued when most of its most important figures have been centrally concerned with the problem.

There existed before the *Annales*, in English-speaking and German countries, a field with the name of 'technology', initiated with the similar awareness of a break first by Christian Wolff in his *Discursus Praeliminaris de Philosophia in Genere* (*Preliminary Discourse on Philosophy in General*, 1728), where he invented the concept in its modern sense. His proposition did not seem to arouse much interest, before being taken over, as both a theoretical and a pedagogical project, by Johann Beckmann first in

1772, and then in 1776 in his *Anleitung zur Technologie*.[3] The notion then reappears in English with Jacob Bigelow's 1829 *Elements of Technology*. But this discipline aims at something entirely different: *technology*'s proposed task is the description, classification, and analysis of technical operations and mechanical arts, the study of "the rules of the arts and the works accomplished by the arts,"[4] as phrased by Christian Wolff.

The discipline itself has seldom been studied; only in the framework of the seminar headed between 1963 and 1965 by Georges Canguilhem at the Institute for the History of Sciences has a systematic history of the 'beginnings of technology' been realized; that is to say, of "the *constitution of the discourse on technical operations as a scientific type of discourse*."[5] The writers of the published version of this collective work, Jacques Guillerme and Jan Sebestik, make a point at the outset: this "history of meta-technique presupposes a history of techniques themselves."[6]

In English-speaking countries, this terminology has a rather different history. As Leo Marx summarized it in a 2010 essay:

> The word *technology*, which joined the Greek root *techne* (an art or craft) with the suffix *ology* (a branch of learning), first entered the English language in the seventeenth century. At that time, in keeping with its etymology, a *technology* was a branch of learning, or discourse, or treatise concerned with the mechanic arts. [...] the word then referred to a field of study, not an object of study.[7]

Marx then went on to assert that this sense of the word *technology* is "now archaic," being replaced around 1900 by "the now familiar sense of the word – the mechanic arts collectively."[8] In an earlier essay, Eric Schatzberg described "the current characterization of *technology* as the methods and material equipment of the practical arts," a meaning whose domination in the English language he dated back to the 1930s, in the wake of Thorstein Veblen's works.[9]

To return to film studies, a good example of the misunderstandings between English- and French-speaking scholars is given by Rick Altman's 1984 polemical essay titled 'Toward a Theory of the History of Representational Technologies'.[10] Altman begins by complaining about "the general tendency of cinema theorists to conflate the concepts of technique and technology,"[11] a tendency for which, he claims, Jean-Louis Comolli's landmark 1971-1972 series of essays 'Technique et Idéologie' is partly responsible. Altman does not really define the terms in his essay, apparently taking the respective concepts' meaning to be obvious, common knowledge. He rather recalls the

importance of their distinction on the basis of one of the most controversial examples in the history of film theory: "deep-focus image [that] depends on a combination of technical and technological concerns":

> While technological changes in the late thirties (availability of new lenses) make deep-focus photography easier and more economical to achieve, anyone who has ever used a camera knows that a depth-of-field choice must be made every time the shutter is tripped. The difference between an exposure made at f/5.6 with a speed of 1/250 and another made at f/16 with a speed of 1/30 is a question of technique, not of technology; the latter image may be a deep-focus image, the former cannot possibly be.[12]

Technology seems, then, to delineate the realm of the hardware-related, the machines, and their components, whereas *technique* describes what concerns gestures, practices, and the conscious choices implied on the operators' side. Microphones belong to technology, while miking is a set of techniques.[13] For Altman, this distinction is crucial: "The important thing to remember is that a dialectical understanding of history is destroyed from the start by any theory which reduces to one those practices that interact as two."[14]

That meaning of *technology* is mirrored in the contemporary uses of the term in the then developing approach known as SCOT, 'Social Construction of Technology'. This trend, originating within sociology, does not deal primarily with historiographical problems, though some of its important contributions involved historical research and implications. An essay like Wiebe E. Bijker's 'The Social Construction of Bakelite: Toward a Theory of Invention' deals explicitly with a historical case study, and the historiographical problem of invention. But the SCOT project is to be understood as a sociology of the techno-industry, trying to understand how and why technical products are produced, and the reasons for their evolution. Bijker formulates the aim of his article as "an approach to a theoretical analysis of the development of technological artifacts."[15] *Technology* is here defined mainly as a set of industrially produced artifacts, circulating among social groups (engineers, consumers, etc.); *techniques* appear as belonging to a separate realm that remains outside the scope of study.

Interestingly, the French-speaking tradition of the history of techniques and technology also emphasizes the importance of preserving the distinction between the two concepts, but defines them on an entirely different basis. If it does differentiate objects and procedures, it still considers their history as a coherent whole. According to Febvre, "the history of techniques

should first be the history of the methods of 'workers', in flesh and blood, or in wood and metal: men, or machines."[16] As Gilbert Simondon later wrote, "[w]hat lies in machines is human reality, human gesture fixed and crystallized in working structures."[17] Machines – that Simondon named 'technical objects' – and techniques are then observed as complementary aspects of one single phenomenon, that is to be understood in its complex cohesion. The term 'technology' is then restricted to the designation of the science that studies these technical objects and procedures. If this meaning is 'archaic' for Leo Marx and most English-speaking scholars, it is still the only accepted one in the French academic world of the history of techniques, a meaning adopted by Guillerme and Sebestik as has been mentioned, but also for instance by Marcel Mauss[18] from the 1920s on, or by the ethnologist André-Georges Haudricourt, who campaigned for the recognition of 'technology as a human science' as late as 1964.[19]

We could argue that adopting either one of these traditions, the notion of 'technological innovation' undergoes quite important changes in meaning. In the French sense, a 'technological innovation' will designate a transformation in the field of the *discourses* about techniques. Such an innovation belongs immediately to theory or historiography. It may or may not correspond to a technical innovation, i.e. the apparition of a new machine and/or a change in procedures. The history of technology in that sense, as has been elaborated by Guillerme and Sebestik, can be constructed on discursive sources, like other, more 'traditional' forms of history. By contrast, the history of techniques poses other problems, as its sources present themselves as deeply heterogeneous in nature, and essentially non-discursive: objects and sets of objects, gestures, and uses, traditional procedures that may never have been described with words.

History and Technology

In his introduction to the *Annales* special issue, Lucien Febvre asked "What is 'writing the history of techniques'?"[20] and proposed a threefold answer. The first task was to "clarify the way that workers have proceeded, at the various times, in each craft or industry" – what Febvre called 'the technical history of techniques'. The historian was to study then the interactions between technical inventions and scientific evolution, and finally to integrate the techniques within the whole range of human activities – economics, politics, art, religion, etc. This triple development, necessary to the coherence of the new discipline, shows the amplitude of the methodological difficulties: new sources to discover and exploit, sources that can be textual,

but also iconographic or material; transdisciplinary collaborations to establish between technicians and historians from different backgrounds, etc.

Today, the historiography of techniques shows that, if Febvre presented the 'technical history of techniques' as fundamental in every way, that part has remained generally the most neglected area of research. Maurice Daumas still complained in 1969 that: "Our insufficient knowledge of the technical history of techniques can partly justify the distortions [...] that are too often visible when general history takes over the history of techniques."[21]

Daumas blamed economic history the most harshly:

> Economic history absorbs in an authoritarian way the history of techniques within itself. It takes the latter as it naturally is and walking hastily imposes on it its own methods of analysis and themes of interpretation.[22]

In cinema history, as elsewhere, the history of techniques tends to be considered, even constructed from the outside, by general or by economic history.

This last approach has been advocated for instance by Douglas Gomery in the framework of the study of one of the key moments for the traditional technological historiography of the cinema: the conversion of the Hollywood industry to sound. He argued in 1975:

> Its advent can be appreciated by viewing it in terms of the economic theory of technological innovation, which posits that a product or process is introduced to increase profits in three systematic phases: invention, innovation, and diffusion.[23]

The term 'invention' here refers to the part of the process that occurred in the obscurity of laboratories – those of the AT&T and RCA companies, as it happened. Then comes the 'innovation' phase, defined as "the adapting of an invention for practical use"[24] and attributed to the Warner Brothers and Fox companies. Finally, "the final phase, diffusion, which occurs when the product or process is adopted for use,"[25] concerns 'the industry' as a whole. But several problems arise. First, as Edward Buscombe already noted in *Jump Cut* in 1978:

> Economic theories can only partially explain technological innovations; economics cannot say why innovations take the form they do, only why they are an essential part of the system.[26]

In fact, the reasons for the creation and the choice of a sound-on-disc system on one side (the Warner Vitaphone) and of a sound-on-film apparatus on the other (the Fox Movietone and the RCA Photophone) are here left unexplained, when their technical, but also aesthetic, theoretical, epistemological, and even economic implications are absolutely crucial.

Moreover, that distinction in phases presupposes a clear break between a 'research' process involving only scientists in their laboratories, and an 'adaptation' process involving practitioners. As a consequence, the users' contribution can never affect the major level of *invention*, but remains restricted to a superficial adjustment to professional uses, these last thus supposed virtually unchanged.[27] This distinctly hierarchized division corresponds to the one between science and techniques, or between engineer and skilled worker.

The history of techniques in cinema poses the same problems as in general history: elaborated from the outside by general theory or by economic history, specifically technical issues disappear or are misrepresented, shaped by the methods and problematics of these disciplines. Thus, approaches corresponding to Febvre's third perspective – that of the relation between techniques and the social context – have been favored, without the concrete reality of techniques having been explored in its complexity. Only when this complexity is apprehended can we imagine confronting ourselves with what ethnologist Pierre Lemonnier still considered a major task in 2011: "to associate in a convincing and useful way – and not simply to juxtapose – detailed studies of technical processes ('how does it work?', i.e. minute analyses of operational chains) with the comprehension of particular aspects of systems of thought and social organizations."[28]

Douglas Gomery's contribution is also exemplary of an approach to technological history organized by the question of innovation, certainly crucial even though other concepts could prove helpful complements. David Edgerton, for instance, proposed, in a 1998 article in the *Annales* published in English in 1999 in *History and Technology*, the following 'eclectic' thesis:

> The innovation-orientation of most studies of technology makes difficult a serious engagement between general history and the history of technology. Conversely, an engagement with general historical problems has produced histories of technology-in-use.[29]

This proposition – where 'technology' appeared as '*techniques*' in the French version – can be discussed in some of its presuppositions, but it is

an important reminder of the non-coincidence of the histories of techniques and of innovations, and of the domination of the latter.

Innovation and Invention

This notion of innovation remains, if only for the place it occupies in historiography and the comparatively relatively few questions it arouses, one of the keys of the technological perspectives. It has been the object of, amongst others, a course titled 'Invention and the Development of Techniques', given by Gilbert Simondon in 1968-1969, at the request of Georges Canguilhem. Simondon returned to the traditional paradigmatic couple of *invention* and *innovation*, to redefine the concepts as they emerge specifically from the genesis of what he calls 'technical objects', in a way that makes explicit their historiographical implications. Simondon distinguished between two modes of evolution of technical objects, corresponding to the two fundamental levels of their mode of existence. "The technical object," he writes, "is on the one hand a mediator between organism and environment, and on the other hand an interiorly organized and coherent reality." From this conception, Simondon described the two phases of technical evolution:

> In a rather general way, relational progresses [bearing on the adaptation of the technical object to the environment] are gradual, continuous improvements, occurring by trials and errors throughout use; they result from experience and add up: they retain the shape of the relation between organism and environment. On the contrary, the progresses of [internal] self-correlation require a problem resolution, an invention that establishes a synergistic system of compatibility. That invention can be brought up by the need of relational progress, but it re-generates the internal logic of the system. [F]or that reason, internal technical progress can barely be continuous; it occurs by leaps, by discontinuous phases [...].[30]

Simondon's analysis results in the distinction between two opposed and complementary evolution principles: innovation, a minor alteration that is part of a continuous process, and invention, a major transformation producing a break in the technical lineage. Thus, a preference for the term *innovation*, or even the complete rejection of the notion of *invention*, corresponds to a continuist conception of history, whereas Simondon's position, in the tradition of French historical epistemology, is dominantly discontinuist.

If we are to adopt this historiographical distinction, the historical knowledge of cinematic techniques then implies to isolate, in the wide range of techniques in use at each period and in the various areas of the field (professional industry or amateur practices), what is to be considered as an innovation, and what has to be seen as an invention, i.e. to distinguish the historical breaks in the machines and the practices and evaluate their importance. Elaborating the 'talkies' as an *innovation* for instance means producing a historical and technical continuity between the 'silent film' and the 'talking pictures' dispositives.[31] One could imagine that the technical and professional reorganizations, as well as the aesthetic transformations, be judged important enough for the 'sound film' to be erected as an *invention*, a new system whose coherence is based on principles deeply different from the former one. In a similar manner, it could be argued that 'color cinema' is an *invention*, an entirely autonomous dispositive, whose history is specific and whose origins are independent from – and older than –that other dispositive which may be only one of its *innovations*, 'black-and-white-cinema'.[32]

But the strong breaks in the history of cinematic techniques should also be searched in the blind spots of general theory and historiography. Some of the major transformations of the way that workers have proceeded, at the various times, in each profession of the film craft or industry, to paraphrase Febvre, have remained invisible from the outside, unperceived or left unexplained. I would like to take a few examples.

The Task of the Historian of Cinematic Techniques: Two Case Studies

On History, Archaeology, and Epistemology: The Viewfinder

The Lumière *cinématographe* is not equipped with a viewfinder. As with a photographic chamber, the frame is chosen while the camera is open, the operator looking through the lens and camera gate before the film is loaded, using a ground glass to materialize the image. The film is then loaded, the machine closed, the crank inserted, and the camera is ready to shoot whenever will seem appropriate. During this phase, the camera must be prevented from moving. All these last operations, including shooting, are technically 'blind': the operator, beside his[33] machine, can only estimate what is inside the frame or not by memory and habit, through the sole observation of the space in front of the camera and with no means

of precise control. That observation is in turn conditioned by the size and place adopted for the crank in the camera, which regulate the distance between the machine and the operator. This distance is an essential factor of the operator's work. It is precisely defined by the form of the machine, its ergonomics, involving the arm as well as the eye.

This configuration of the *cinématographe* as a technical object derived from a series of contemporary procedures, part of which were elaborated in professional or 'amateur' photography – amateur in a more restricted sense than is known today – that field being precisely the 'target audience' for the *cinématographe* as conceived by the Lumières. The majority of the photographic cameras of the time were not equipped with viewfinders, even if some were beginning to appear, in different shapes. The viewfinder poses a non-trivial technical problem: it must give the photographer the most exact idea of the frame, without altering the image itself – a problem to which that of the focus must be added, which is beyond the scope of this chapter.

The solution of 'reflex' viewfinders has been proposed in the 1930s in photography, and adopted progressively until it became dominant from the 1960s, not without discussions. For instance, some cameras among the most expensive and prestigious on the market today – Leica M models – are furnished with non-reflex viewfinding systems. All non-reflex viewfinders are marked with parallax, thus providing only an approximate version of the actual frame, whose level of accuracy depends on the distance of the object to the camera. If that feature could be useful for street photography, where quickness of reaction can prove more vital than neatness of composition, framing through the film gate remained the most precise technique, thus adopted within the framework of professional fiction film shooting. It did imply a very specific conception of what it is to take a photograph, quite different from the one dominant today: the 'operational chain' (André Leroi-Gourhan) was based on a temporal delay between the composition of the image and its taking. Framing and shooting were two clearly disconnected operations, separated by seconds or minutes. In photography, this could be partly settled by the requirement of immobility: neither camera, nor subject would move between the two moments, so that the time break would not affect the image. But in cinema, the introduction of movement complicates the problem. In any case, that did not seem complicated enough for Lumière to introduce some kind of viewfinder on his machine.

As is well known, the Lumière views, and in particular those shot by Louis Lumière himself, show a great precision of what he called *mise en page* ('layout'), whether on static elements or on objects entering, leaving,

or moving within the frame.[34] Replacing this attention to the composition of the image within the technical practices of the time makes us reconsider the gestures and mental operations involved. Lumière did not coordinate the space and time organization of his views with his eyes constantly watching the edges of the frame; rather, an important part of his activity (deciding when to start cranking on the platform of the La Ciotat railway station for instance) was based on the memory of the limits of the field, as transposed in the profilmic space perceived directly by the naked eye, and from a point of view quite different from the physical place of the lens. Thus, recontextualized, the virtuosic composition of the resulting views is of course rather impressive, but beyond the question of Lumière's skills as a photographer, it reveals a singular visual practice, emerging from the particular set of skills required of the trained photographer of the time.

This 'lack' of a viewfinder may appear as a strong constraint. But if the cameras conceived for the amateurs or newsreel operators have been equipped with parallax viewfinders rather early, an important proportion of professional cameras remained unfitted with such items for quite a long time, even though these appendices were light, wieldy, and inexpensive to make. The 'Professional' Pathé camera has been, as Laurent Mannoni recalled, "one of the most widely used cameras in Europe and in the USA from 1908 and into the 1920s"; it was, for instance, Billy Bitzer's main tool. It was not fitted with any viewfinder, entailing working procedures similar to those of the Lumière operators – as can be attested through photographs showing Bitzer at work, framing through the camera gate of the open machine, or shooting watching the actors directly, some two feet away from the camera. That Pathé camera was also one of the very rare devices, after the Cinématographe, where the crank was placed at the back of the machine. On the majority of other models, the crank was on the right-hand side, so that the body of the operator got closer to the apparatus. All these elements conditioned Bitzer's perception of profilmic space and of the acting, as well as the relative positions – whether physical or hierarchical – of the operator and the director in the concrete space and time of the shooting, and within the division of labor organizing the industry of the time. Of course, Bitzer and Griffith's intellectual and human relations, together with their respective conceptions of what a frame is, have also been an important factor for the structuration of both the works and the labor organization in the films they made together.

The arrival of 'reflex' viewfinders in cinema in 1937 with the Arriflex 35 and their diffusion after World War II have deeply altered these practices. From that moment on, the cameraperson kept his/her eyes glued to the

viewfinder. S/he could not easily withdraw them from the camera: chances were that light would enter through the viewfinder and fog the image. The camera thus got closer to the operator's body to the point of almost merging with it, a tendency that kept developing through the researches on light cameras, that can be carried on the shoulder – Cameflex, Arriflex, Éclair, then Aaton. Building a portable camera supposes thinking in an entirely different manner the position of the elements – the viewfinder, but also motor, magazine, battery, handle, etc. – to facilitate the necessary gestures while maintaining the proper balance. That constitutes an example of innovation by adaptation to the environment, even if in the end, the importance of the internal (as well as procedural and aesthetic) reorganizations involved could make us wonder if it could not be considered an invention.

Of course, such a study should be furthered with the analysis of the internal conception of viewfinders, of their interactions with the other elements of the machine, the technical systems of which they partake and its self-correlation. The reflex viewfinders of Arriflex 35 cameras consisted in revolving mirrors fixed on the shutter; those of the reflex Bolex H16, introduced in 1956, in a semi-reflecting prism. These technical decisions involve multiple problems, including the internal coherence of the machine as well as considerations of cost, ergonomics, and use, sturdiness, integration within current practices, etc. A mirror viewfinder makes the shutter heavier and more fragile, and presents to the operator an image altered with a rather significant flicker – due to a one-bladed shutter. By contrast, a prism absorbs a noticeable quantity of light, which can be annoying in itself but moreover imposes to take that absorption into account in the gradation of lenses.[35] That is not a major problem for amateur cameras, which can be fitted with a specific set of lenses; but it may become unacceptable for a professional who needs to adapt particular lenses to the machine.

Thus, following diachronically the evolution of one element of cinematic machines – the viewfinder, for instance – has to be done in parallel with investigations of the internal logic of the machine and the procedures it is involved in at a given time. The set of technological decisions founding a machine's coherence is based on a certain idea of its task and of the right way of doing it. An archaeology of these decisions must be established. The mirror reflex viewfinder comes from the photographic apparatus of the tip-over mirror associated with curtain shutters; but its cinematic version is more 'concrete' in the sense developed by Gilbert Simondon,[36] as the reuse of the revolving shutter makes it not two synchronized distinct devices, but one single apparatus with a dual function. Still, the principle remains the same: the user can see the exact image through the lens *except at the very moment*

of exposure, when the user is blind, the mirror obstructing the view to let light impress the film. Practical difficulties then follow similarly for the photographer and the cinematographer, all media differences being taken into account. A study on longer terms shows that the forms of viewfinders can be traced back to the perspective machines designed by Alberti and Dürer, some of their components being quite rigorously transposed. As in these devices conceived to help the painter compose accurate perspectival representations, viewfinders materialize and fix the monocular point of view, and decompose the visual field according to a predefined regular geometrical pattern. Such an archaeology would involve the observation of circulations and crossings between technical lineages, a specific form of intermediality than can include non-mediatic technical objects.

But an epistemology of these technological decisions is also needed: the reconstruction of the overall logic of these machines and procedures, and the technical networks to which they belong. These networks are historical, cultural, economic, and involve producers, spectators, theaters, industries, modes of diffusion, etc. The internal logic of machines and gestures can thus unveil its implicit presuppositions, the paradigms within which they were conceived and used. Jacques Guillerme and Jan Sebestik summarized Christian Wolff's justifications for the foundation of technology as a science thus:

> Even as low a manual art as wood cutting entails an implicit conceptual structure that dictates the execution of instrumental operations: 'there is a reason why wood can be cut, and why it can be cut with a wedge, and nevertheless also with the axe.'[37]

If deciding what is or is not an innovation or an invention is a technological act, its coherence must be determined by the research of these 'implicit conceptual structures', of their progressive or sudden transformations, and by the understanding of the precise points affected by these changes.

The viewfinder is a device of mediation between technical object and environment, between machine and operator. Any conception of the viewfinder is thus immediately connected with a conception of the work and function of the camera operator, favoring a certain organization of procedures and professions, certain gestures, a certain idea of what it means to compose a frame. As a consequence, it is also related with an aesthetic conception of the cinematic frame.

If (most) 'professional' digital movie cameras are still fitted with a traditional 'optical' viewfinder, some middle-range models, used for

documentary among other things, only bear electronic viewfinders in the form of small display screens – as do amateur photographic cameras, cell phones, etc. The operator's eye thus regains its distance from the camera. The consequences of this transformation are rather important, and involve the relation of the operator's body with the machine, with the outside world, but also the relation between the one who films and the one who is filmed. French documentarist Denis Gheerbrant explained that when shooting with a traditional camera:

> At a certain moment [...] I take the camera on my shoulder, I put the eyepiece in front of my right eye, I close my left eye and facing the one who is filmed are a face whose eyes are closed and a camera.
> We are not anymore in the framework of a day-to-day relation sustained by the exchanged gaze. We are in a relation larger than ourselves, each with a specific place. The camera is the spectator between us and I almost feel like saying that it is by closing my eyes that I create a place for the spectator, it's a paradox for a filmmaker![38]

With a screen instead of an eyepiece, that place constructed for the spectator disappears.

The electronic viewfinder crosses another history: that of the 'video assist', a video monitor connected to a film camera and allowing the director and the team to watch 'live', during the shooting, the image about to be recorded on the film, an image which will only be visible later, after having been developed and printed in the laboratory. The 'television' dispositive thus inscribes itself at the heart of the 'cinema' dispositive. These 'video assist' apparatuses, introduced in the middle of the 1960s notably by Jerry Lewis and Blake Edwards, have deeply transformed film shootings and particularly the positions of the filmmaker and the cinematographer. Hitchcock or Ford used to be sitting next to the camera, watching the actors at work before their eyes, imagining a framed result they would only discover on a big screen during the projection of the dailies. Today, most filmmakers – with only a few exceptions, like Jacques Rivette or Danièle Huillet and Jean-Marie Straub – do not watch the actors anymore, but an image on a TV screen with headphones, and the physical distance between filmmaker and actors has increased to the loss of all direct contact. An early radical experiment in that direction has been led by Francis Ford Coppola and his 'electronic cinema' system on the shooting of *One From The Heart* (1981), where the director remained in a separate video editing room during the shooting. This transforms the working relations as well as

the division of labor: the cinematographer used to owe part of his authority on the set to being the only one who could foresee how the film would look like. With video assist systems, the director and other members of the team have this capacity, and can discuss lighting choices with more arguments. This seems also to participate in the transformation of the relation to frame and space in films: the predominance of long shots in works such as John Ford's for instance is linked with a visual imaginary built by theater projection; it may seem more difficult to conceive a film based on extremely wide shots if they are controlled, during production, on an electronic screen whose size implies that the actor or actress's facial expression become indiscernible.

Thus, elaborating on the study of the form and evolution of a supposedly modest element of the camera machine brings on, inextricably, procedural, and aesthetic implications, and leads to question the epistemological conditions of the production of the object, the users' ways of doing and the professional organization, as well as the cultural aspects of the reception of the images.

On the Locating of Discontinuities in the History of Techniques: From Virtual Editing to Tape Splicers

In a whole other area of cinematographic work, editing also shows a series of technical transformations with major consequences. The Moviola, among the first machines allowing the editor to watch the animated pictures when choosing the cutting point, was invented in 1924. Before, and a few years afterwards depending on the contexts, editing was based almost exclusively on the observation of the series of photograms, the decisions being tested afterwards in the projection room. Therefore, the editor had to be able to judge the cut on the 'interval of movement', as Vertov said, between the images, and her or his activity implied a disjunction and a constant circulation between the editing room, the domain of still images, and the screening room, the only place where moving images could be seen. From a technical standpoint, the Moviola was not really an invention: it was an adaptation of the projector, made into a single-spectator machine. But it provoked a shift, as the editor could decide the cutting points on the perception of movement itself – even if on a small screen. The arrival of 'flatbed' editing tables such as the Steenbeck in the 1960s constituted another interesting innovation: the machine found its own coherence, becoming independent from the projector model. It adopted the continuous film motion mode based on the rotating prism of mirrors that

Emile Reynaud had invented for his Praxinoscope in the 1860s. But another thing may be more important. This machine is contemporary with a major transformation: the introduction of adhesive tape in editing techniques. Before that, when an editing point was decided, the two pieces of film were glued together using film cement. That weld is strong, withstanding the tractions of the intermittent movement in the Moviola or the projector, but impossible to undo – it is still the technique used in the laboratories for negative film editing. To correct an edit that was considered wrong in the projection room, one photogram has to be cut off on either side of the weld: two images were 'lost' in the process. Mistakes were barely forgiven. By contrast, tape splices can easily be peeled off. Thus, the editor can try edits knowing s/he will be able to step back without loss. Tape splicing does have drawbacks though: for instance, the tape is perceptible on the editing table as well as in the screening room, as those of the readers who have seen film projections will have experienced. It can become difficult, if trials and errors accumulate on a few images around a shot transition, to judge the success of the edit due to the jumps provoked by the successive layers of tape. Still, this solution has been massively adopted in the editing rooms, and entailed important transformations in the editors' practices and relation to the cut. It could be argued that virtual editing is finally nothing but a radical technical accomplishment of a mode of working and a conception of the cut that was born with tape editing. In this perspective, to use Simondon's vocabulary, the invention would be tape splicing, and the innovation virtual editing. Of course, this succession doesn't account for the evolution of lineages of technical objects deriving from one another in their conception. It doesn't even follow the transformation of the technical procedures of editors, i.e. of the concrete organization of their working gestures – even if the ergonomics of virtual editing software seeks to transpose as exactly as possible those of film editing rooms. But this succession can reveal the history of editing practices as linked with the evolution of procedural logics, underlying both methods and machines.

Only a close attention to the 'technical history of techniques' can allow to elaborate their social, economic, and aesthetic implications. Only that can help us evaluate the scope of technical transformations, whether they be the evolution of the form of camera viewfinders, the introduction of video assist systems or tape splicing, or the transition from analog to digital formats. If something like a 'technical thought' is a work in these objects, a specific non-verbal thought, as Georges Canguilhem or Pierre Francastel have argued,[39] it is for us more important than ever to grasp

its coherence with precision, for its stakes are crucial at several levels. As Gilbert Simondon recalled:

> Not only the consequences but also the conditions of the genesis of an invention imply collective contents and historical aspects, with the particular way that knowledge and power are transmitted in the form of constituted objects or production processes, and with the requirement of the conditions of reception, which are not only economic but cultural.[40]

Objects, production processes, and reception conditions cannot be separated in the historical research, because "the users" gestures are also part of the "technical reality," and thus "technical objects cannot be considered as absolute realities existing on their own."[41] Of course, objects are of primary importance for the historian insofar as they partly objectify the processes, their lasting materiality constituting them as archives of these otherwise ephemeral phenomena that are gestures and cultural conditions. But the archaeological methodology should envision these objects only as nodal points in technical, cultural, and epistemological networks. To establish the discontinuities in the history of techniques, the consideration of *operations* may, in the end, be a more important tool than genealogies of objects. *Splicing* or *framing* can be done in many different ways, with many different tools; but they are specific operations, which can be distinguished within the cinema production system – if only because they constitute the attributions of different specialized workers in its division of labor. These operations can be defined by a series of particular problems, to which the apparatuses and traditional gestures are technical solutions.[42] On an epistemological level there is an 'implicit conceptual structure' that has to be common within each of these various 'operational chains', and on a historical level, the coherence of the objects can be understood only within the frame of each technical system, which it can in turn participate to reveal. Moving from objects to operations probably requires major methodological shifts; but it allows for a better understanding of the major role of users in the evolutions and transformations of techniques, the users being here considered not as consumers, but for the technicity embodied in their gestures. There remains, then, no difference between a user and an inventor.

Notes

1. See for instance Huppert, 'Lucien Febvre and Marc Bloch: The Creation of the *Annales*', 510-513.
2. Febvre, 'Réflexions sur l'histoire des techniques', 531.
3. Beckmann, *Anleitung zur Technologie oder zur Kenntniß der Handwerke.*
4. 'Reddenda hic potissimum ratio est regularum artis & operum, quae arte perficiuntur'. Wolff, 'Discursus praeliminaris de philosophia in genere', in *Philosophia rationalis sive logica*, 33 (my translation).
5. Guillerme et Sebestik, 'Les Commencements de la technologie', 1 (my translation).
6. Ibid. (my translation).
7. Marx, '*Technology*: The Emergence of a Hazardous Concept', 562.
8. Ibid.
9. Schatzberg, '*Technik* Comes to America', 490.
10. Altman, 'Toward a Theory of the History of Representational Technologies', 111-125.
11. Ibid., 111.
12. Ibid., 112. The radicalism of the 'cannot possibly be' should be discussed, as it presupposes that 'deep-focus' is an objective, technical quality of the image, independent of its subject. Still, if a shot is made for instance of a painting hanging on a wall, even a technically shallow depth of field can produce a perfectly sharp picture, that couldn't be differentiated by the spectator from a 'deep-focus image'.
13. Ibid., 115.
14. Ibid.
15. Bijker, 'The Social Construction of Bakelite', 180.
16. Febvre, 'Réflexions sur l'histoire des techniques', 531.
17. Simondon, *Du mode d'existence des objets techniques*, 12.
18. See Mauss, *Techniques, Technology and Civilization*, and Nathan Schlanger's 'Introduction: Technological Commitments: Marcel Mauss and the Study of Techniques in the French Social Sciences', 1-29.
19. Haudricourt, 'La Technologie, science humaine', 28-35.
20. Febvre, 'Réflexions sur l'histoire des techniques', 531.
21. Daumas, 'L'histoire des techniques', 11.
22. Ibid., 13.
23. Gomery, 'The Coming of the Talkies', 193-194.
24. Ibid., 194.
25. Idem.
26. Buscombe, 'Sound and Colour', 23-25.
27. On the necessity to rethink the status of the user in technology studies, in particular from a feminist perspective, see Oudshoorn and Pinch, *How Users Matter: The Co-Construction of Users and Technology*.
28. Lemonnier, 'Fallait-il en passer par là?', 90.

29. Edgerton, 'From Innovation to Use', 119.
30. Simondon, *L'Invention dans les techniques*, 102-103.
31. For this notion, see Albera and Tortajada (eds), *Cine-Dispositives: Essays in Epistemology Across Media*.
32. On this 'eclectic' hypothesis, see Fihman, 'De la "Musique chromatique" et des "Rythmes colorés"', 319-323, and my 'Cinéma, couleur et mouvement: Kinemacolor et abstraction'.
33. Lumière operators seem to have been predominantly male.
34. See Gaudreault's classic analysis of Lumière's *L'Arroseur arrosé* (1895) in *Du littéraire au filmique: Système du récit*, 31-32.
35. The *Bolex H16 Reflex Instructions Manual* specified that the brand produced a 'Bolex Exposure Meter' which was "designed and calibrated especially for the H16 Reflex camera and allow[ed] for the fact that 20-25 per cent of the light [was] deflected into the viewfinder by the reflex prism." (p. 13). Should the user want to use another exposure meter, the manual featured a chart of 'real' and 'adapted' exposure times.
36. See Simondon, *Du mode d'existence*, 25.
37. Guillerme et Sebestik, 'Les Commencements de la technologie', 28.
38. Interview with Catherine Schapira, December 1996, in *La vie est immense et pleine de dangers. Un film de Denis Gheerbrant*, DVD booklet (Paris: Les Films du Paradoxe, 2005), n.p.
39. Canguilhem, 'Activité technique et création', 499-509; Francastel, 'Valeurs socio-psychologiques de l'espace-temps figuratif', 89-154.
40. Simondon, *L'Invention dans les techniques*, 293.
41. Simondon, *Du mode d'existence*, 239.
42. On the concept of *problem* within this framework, see my *Inventer le cinéma.*

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About the author

Benoît Turquety is an Assistant Professor (Sandoz Family Foundation chair) at the University of Lausanne, where he belongs to the "Dispositifs" research group, focusing on media archaeology and epistemology. Educated as a film technician in the École Nationale Supérieure Louis-Lumière (France), he holds a PhD from the University Paris 8. His dissertation has been published under the title *Danièle Huillet and Jean-Marie Straub, "Objectivistes" en cinéma* (2011). These last years, he has specialized in the history and epistemology of film technology and digital cultures, and published several articles on the question in various journals and books. He has edited a special issue of *Early Popular Visual Culture* on special effects, and his last book, *Inventer le cinéma. Epistémologie: problèmes, machines*, has been published in 2014 by L'Âge d'Homme (Lausanne).

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