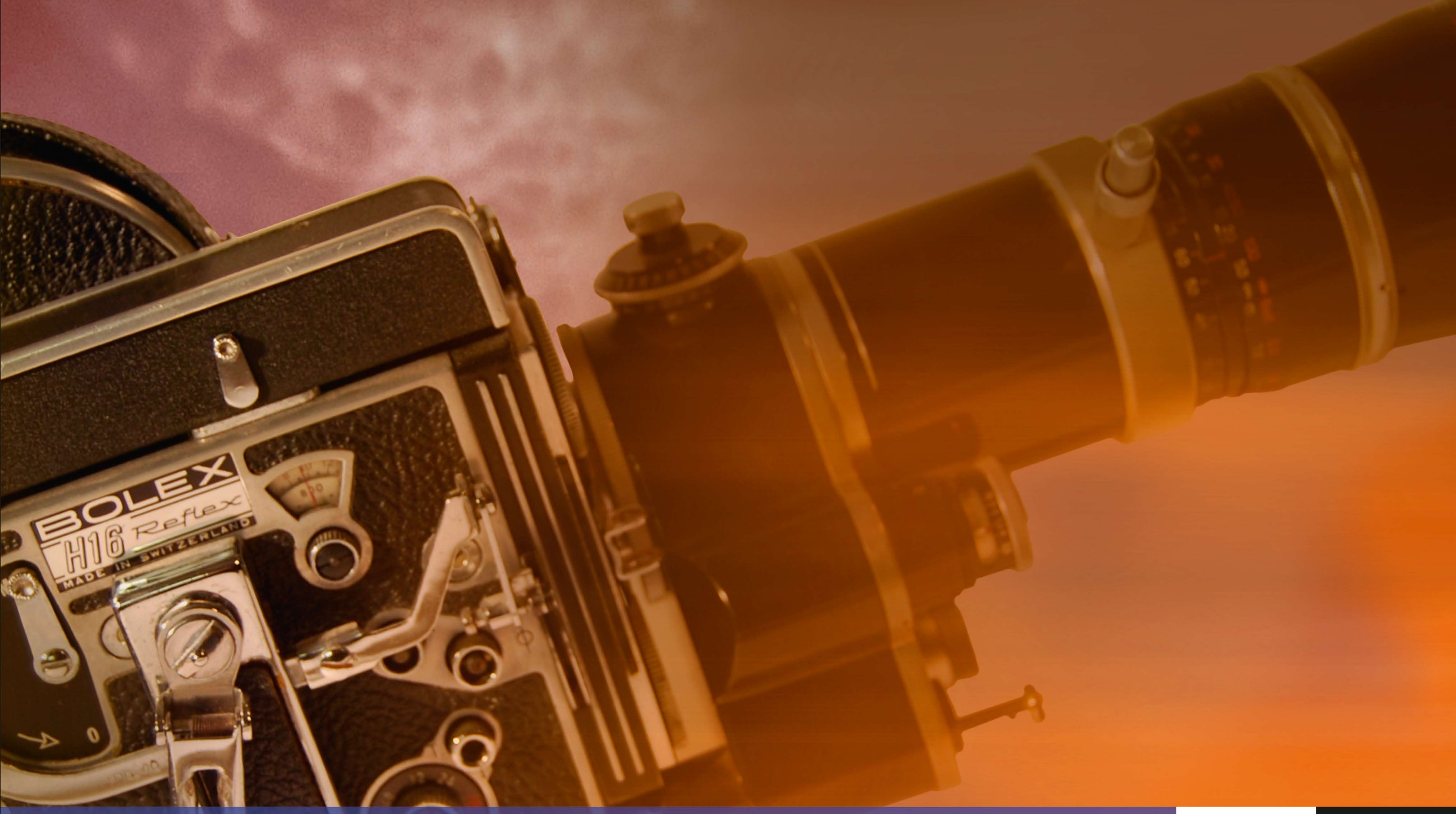

TECHNĒ/TECHNOLOGY

THE KEY DEBATES

Mutations and Appropriations in
European Film Studies

Annie van den Oever (ed.)

4

Amsterdam
University
Press

Technē/Technology

The Key Debates

Mutations and Appropriations
in European Film Studies

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Technē/Technology

Researching Cinema and Media Technologies – Their Development, Use, and Impact

Edited by Annie van den Oever

Amsterdam University Press

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Editorial

Thinking and theorizing about film is almost as old as the medium itself. Within a few years of the earliest film shows in the 1890s, manifestos and reflections began to appear which sought to analyze the seemingly vast potential of film. Writers in France, Russia and Britain were among the first to enter this field, and their texts have become cornerstones of the literature of cinema. Few nations, however, failed to produce their own statements and dialogues about the nature of cinema, often interacting with proponents of Modernism in the traditional arts and crafts. Film thus found itself embedded in the discourses of modernity, especially in Europe and Soviet Russia.

"Film theory," as it became known in the 1970s, has always had a historical dimension, acknowledging its debts to the pioneers of analyzing film texts and film experience, even while pressing these into service in the present. But as scholarship in the history of film theory develops, there is an urgent need to revisit many long-standing assumptions and clarify lines of transmission and interpretation. *The Key Debates* is a series of books from Amsterdam University Press which focuses on the central issues that continue to animate thinking about film and audiovisual media as the "century of celluloid" gives way to a field of interrelated digital media.

Initiated by Annie van den Oever (the Netherlands), the direction of the series has been elaborated by an international group of film scholars, including Dominique Chateau (France), Ian Christie (UK), Laurent Creton (France), Laura Mulvey (UK), Roger Odin (France), Eric de Kuyper (Belgium), and Emile Poppe (Belgium). The intention is to draw on the widest possible range of expertise to provide authoritative accounts of how debates around film originated, and to trace how concepts that are commonly used today have been modified in the process of appropriation. The book series may contribute to both the invention as well as the abduction of concepts.

Ian Christie, Dominique Chateau, Annie van den Oever
London/Paris/Amsterdam

Acknowledgments

Technē/Technology is not a book organized around a single thesis – except the assertion that technique is a major concern for film and media scholars, whether we approach this in terms of philosophy, techno-aesthetics, semiotics, apparatus theory, (new) film history, media archaeology, the industry or sensory/cognitive experience. It deliberately includes contributions by scholars working in very different ways on a wide range of technology-related issues; but it does so in the spirit of the series, *The Key Debates*, in which *Technē/Technology* marks the start of a second phase of unique transnational co-operation, centrally between the Netherlands, France and the UK. The series has already supported a number of stimulating symposia and workshops in all three countries, and produced three collections: *Ostrannenie* (2010), *Subjectivity* (2011), and *Audiences* (2012). The series, like this particular book, owes much to Ian Christie, who never fails to generously add precision, critical insight and overview to a discussion, and to our loyal third series editor, Dominique Chateau, who, in one of our Paris meetings, was the first to stress that a book on technology was paramount in our series, not only because the topic is debated so often and so eagerly in our field of studies, but also because philosophies of technologies tend to reflect recent and past technological transitions and in turn have transformed film theory and some of its key concepts.

One of the real challenges of this project was to bring an international group of scholars together from a variety of countries, speaking different languages, and coming from different disciplines and academic traditions. The real pleasure was to see all the different inputs come together, challenge and contradict each other, to form a coherent whole. The ongoing dialogues with all the authors from which the book grew were in themselves inspirational. Therefore I wish to express my sincere gratitude to both the contributors to this book as well as to the members of the Editorial Board and some other colleagues for their enthusiastic and unrelenting support and extremely generous intellectual contributions to our book series in every phase of its becoming, and to this book in particular. For their contributions to this book, I sincerely thank Geoffrey Winthrop-Young, Martin Lefebvre, Robert Sinnerbrink, Annemone Ligensa, Benoît Turquety, Patrick Crogan, Markus Stauff, Céline Scemama, Pasi Väliaho, Laurent Jullier, Nanna Verhoeff, Heidi Rae Cooley, Malte Hagener, Karel Dib-

bets, Francesco Pitassio, Ed Tan, Andreas Fickers, and André Gaudreault. Some of the Editorial Board members were already present at the very first meeting which helped to shape the series and they still help us to move ahead. I once again like to thank Laura Mulvey, Roger Odin, Francesco Casetti, Laurent Creton, Jane Gaines, Frank Kessler, András Bálint Kovács, Eric de Kuyper, Patricia Pisters, Emile Poppe, Pere Salabert, Heide Schlüpmann and Vivian Sobchack. I also like to thank Janet Staiger for accepting our invitation to become a member of our Advisory Board to fill the empty space which was so sadly left open by Miriam Hansen's passing.

In addition to thanking all the authors who responded to a tight deadline, acknowledgment is due to the previous publisher of one contribution which is reprinted here; I cordially thank Ariane de Pree from Stanford University Press for allowing the reprint of "What Are Media?" and its author Lambert Wiesing for his extremely generous support to our project.

The project has also depended vitally on generous funding from the Netherlands Organisation for Scientific Research (NWO), and on sympathetic support from Birkbeck College, University of London; the University of Groningen; and Université Paris 1, Panthéon-Sorbonne. I am grateful to colleagues at the University of Groningen who have supported and made possible my involvement in this project, particularly the Head of the Groningen Research Institute for the Study of Culture (ICOG), Liesbeth Korthals Altes, and ICOG's eternally supportive executive, Gorus van Oordt. I am also particularly grateful for our ongoing debates on film, media, and art-related topics to Barend van Heusden and the Department of Arts, Culture, and Media; to Pascal Gielen and Thijs Lijster from the Centre for Arts in Society; and last, but certainly not least, to the Film team and the Film Archive's team of the University of Groningen. In the series of exhibitions and workshops we organized so far, our February 2013 Symposium on the Film Archive as a Research Laboratory, hosted with Giovanna Fossati as Head Curator of the EYE Film Institute, The Netherlands, stands out as an intellectually inspiring enterprise from which I have learned a great deal, some of which has helped shape this book. I wish to thank Sabine Lenk, Susan Aasman, Andreas Fickers, Heide Schlüpmann, Eef Masson, Jan Holmberg, Annelies van Noortwijk, Anna Backman Rogers, Miklós Kiss, Julian Hanich, Axel Roch, Johan Stadtman, Jaukje van Wonderen and the unrelenting Giovanna Fossati for support and inspiration.

Finally, I must pay tribute to Viola ten Hoorn, without whose immense help and wonderful precision the book would not have been assembled so joyfully in such a short time; and to publisher Jeroen Sondervan, who has been extremely supportive of the whole series, as well as this volume. I sincerely thank Amsterdam University Press. This also includes the staff members who did wonderful work for this and the proceeding books: Magdalena Hernas for International

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Annie van den Oever
Amsterdam, August 2013

Introduction: Researching Cinema and Media Technologies

Annie van den Oever

In an anthology of terms presented in a Surinam newspaper on February 25, 1898,[1] an anonymous journalist summed up the more than *fifty* different terms which were used by technicians to label the new technical inventions (and patents) which they came up with after the amazingly successful Lumière invention of the kinematograph. The long list of terms clearly indicates the powerful impact of the new Lumière technology on other technicians' imaginary:

> [...] kinegraaf, kinetograaf, kinematograaf, kinematoterm, kineoptoskoop, kineoptikon, kinematoskoop, kinebleposkoop, kinegrafoskoop, kinevivagraaf, kinesetograaf, photokinematograaf, photoskoop, motophotoskoop, phoiotroop, mutoskoop, motorgraaf, movendoskoop, mouvementoskoop, manimatoskoop , theatograaf, vitagraaf, vitaskoop , vitaphostoskoop, eieroskuop, kathoskoop, magniskoop, mutoskoop, phonendoskoop, gerialgraaf, sterioptikon, fammograat, zoograaf, biograaf, heligraaf, velegraaf, rollograaf, artograaf, vivendograaf, vitamotograaf, kinestereograaf, badizograaf, heliecinegraaf, phautograaf, panoramograaf, pantobiograaf, pantomimograaf, chronophotograaf, photochronograaf, scenamatograaf, pictorialograaf.[2]

The journalist's point was to show how deeply the Lumière kinematograph had affected and inspired the other inventors and also how quick they were to jump on the bandwagon in hopes to profit from this lucrative invention themselves by slightly changing the new technology and putting the seemingly new invention under the protection of a new patent of their own. The long list of terms also suggests the many different ways in which technicians envisioned the new technology to be further developed for a great variety of future uses. Clearly, the "truly new" Lumière innovation evoked all sorts of new ideas in the minds of other inventors, artists as well as technicians, and triggered an energetic torrent of copying activities and some further vibrant experiments, producing a stream of minor and major inventions. It created one of those intervals of bliss with new technological inventions that affected people far beyond the circle of engineers. As the writer of *War and Peace* and *Anna Karenina*, Lev Tolstoy, for instance re-

marked in his diary entry of April 26, 1895, describing a day in which he took his daughter Sasha and a friend to the theater, the little girls were apparently so excited and affected by the electric lights that they could hardly take in much more of the matinée.[3] If it is largely by technology that contemporary society hangs together, as philosophers have stated,[4] then it should not surprise us that technology also caught quite a bit of attention of philosophers. For similar reasons did it attract attention from film and media scholars. Not only had the young practice called "cinema"[5] from its early years onwards been saturated with hardware, people in the industry had also been quick to understand that the new technological inventions demanded a skilful and artful use. The Greek word τεχνικός (technikos) means "of or pertaining to art, artistic, skilful." The term "technikos," as the etymological root of "technique," situates the technical in the field between art and hardware, in other words, between technology (as knowledge of techniques) and knowledge of a skilful or artful use.[6] There are film scholars who have argued that film history is the history of technology (for an overview, see Benoît Turquety in this book). Moreover, the history of theories of film certainly is punctuated with theories of technology. In all these theories, the impact of cinema's technologies on the viewers played a crucial role. To name but a few: Louis Delluc, Germaine Dulac, Jean Epstein and others theorized on *photogénie* and the close-up; Sergei Eisenstein, Vsevolod Pudovkin, Dziga Vertov on montage; Rudolph Arnheim on techno-perception; Jean Baudry and Christian Metz on the "apparatus" of the cinema. They affected film studies in major ways. Furthermore, some major 20th-century philosophers and media scholars, who were made to rethink the impact of (media) technologies on culture, had a considerable impact on the fields of film studies and media archaeology. An obvious example is Walter Benjamin, who was to reassess the rupture in perception and aesthetics created by the new cinema machine and more in general the effects of mechanical reproduction on the aura of the artwork. Another example is Marshall McLuhan, who was as much inspired by the new era of television as he was by Harold Innis, when he coined the famous slogan that the "medium is the message." A third example, from the new era of digital media of the 1990s, is Friedrich Kittler, who inspired attention for the medium's materiality and the distinction between *technische Medien* (technical media) such as photo and cinematographic media, and other communication media such as language. Yet others like Bernard Stiegler, who constructed a post-phenomenological account of the mediated experience, and Paul Virilio, who explored the "logistics of perception" and the ways in which media technologies and wars are tied together, also had a considerable impact on the fields of film and media studies.

One of the questions to be addressed in this book is how the new philosophies (of technology) created in relation to major technological transformations – such as the new philosophies of technology formulated by Benjamin, Heidegger, McLuhan, Kittler, Stiegler, or Virilio – could or did contribute in turn to the

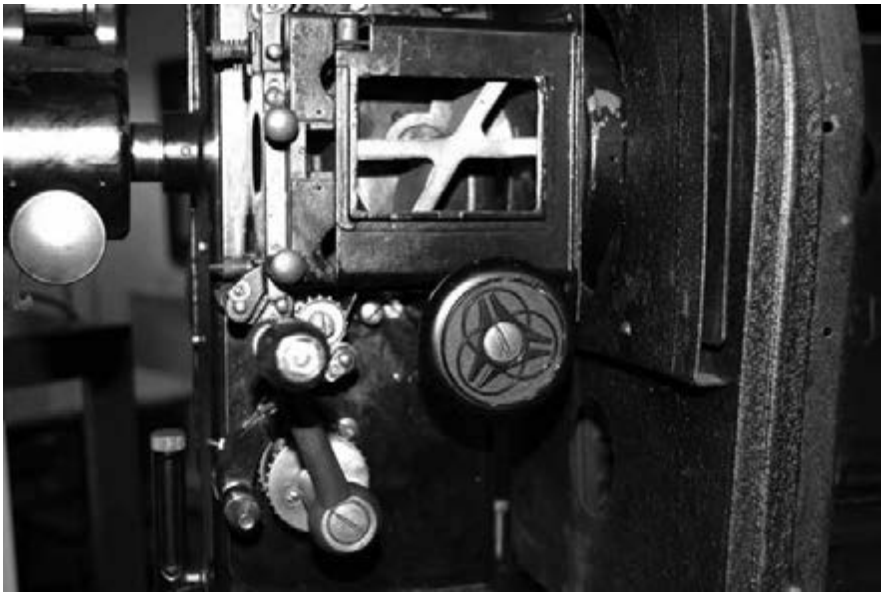

Fig. 1: Details from a Zeis Ikon 35 mm projector. Photo made by Johan Stadtman. Courtesy of the Film Archive, University of Groningen.

modification of film theory and some of its key concepts. A second question is whether there is perhaps something distinctly cyclical to this, meaning that the intervals in which theorizing on technology took priority were intercut by intervals of relative silence with regard to the question of technology. A third question to be addressed is whether the theoretical shifts instigated by Benjamin, Heidegger, Kittler and others could be made productive for the field of film studies. These questions are even more pressing when we take into account that the cinema (as suggested above) is generally perceived of as a practice ruled by hardware, and that film as an artifact and a medium were often firstly affected on a very practical level by the introduction of new technologies, but once these technologies were well and truly appropriated, they, secondly, called into question the very underpinnings of the field. For instance: Did the new digital simulation, recording, editing and projecting technologies not call into question theories of "realism" in film, suggesting they had reached their expiry date? Since the early 1990s, which saw the beginning of the digital era, many contemporary scholars have been preoccupied by theoretical issues related to the context of media technologies. Film history and film theory were reassessed by them over and over again. It is the objective of this book to contribute to this enterprise.

About this Book

Part I opens with Dominique Chateau's "The Philosophy of Technology in the Frame of Film Theory," in which he returns to Walter Benjamin's famous essay on "The Work of Art in the Age of Its Technological Reproducibility." This seminal text has repeatedly been a source for reflections on the birth of the cinema and the impact of technology on culture in the past twenty years. Chateau's contribution to the discussion of technology envisioned in this book, however, uses Benjamin's text as a case to study the reciprocal relation between technological and theoretical innovation. He starts with a question which is of fundamental interest for the field at this point in time: If major technological transitions felt by everyone tend to trigger new theories or philosophies of technology, then the question raised is also whether the new cluster of ideas related to such technological transitions *in turn* have contributed to the transformation of film theory and several of its key concepts. Chateau first of all demonstrates that "The Work of Art" provides a substantial ground for this discussion, as Benjamin presents a series of answers to the very question he raises with a degree of relevance for the different time periods in which they were reassessed. Chateau does not present a linear reading of "The Work of Art." He sees the essay as "a network of concepts" whose interrelations offer a "matrix" which one can use to interpret the implications of the invention of cinema as well as the advent of the digital revolution.

In "Toward an Archaeology of the Cinema/Technology Relation: From Mechanization to 'Digital Cinema'" Benoît Turquety looks at the historiography of the cinema from the outside in, as if he were not part of it, in an attempt to reestablish the history and historiography of the cinema within the now often forgotten context of the social sciences of the time. He starts with the statement that the history of the cinematic medium has established itself from the very beginning as a *technological* history. According to Turquety, the patents regarding cinematic innovations issued during the early phase of the cinema and their economic and patriotic implications; and the scientific curiosity from which sprung many of those innovations that shaped the cinema as we now know it, are telltale signs of the preoccupation of the cinema with technology. Not surprisingly, motion picture-oriented publications between 1895 and 1925 all focused on describing the "evolution of the machines," and the "historical-ideological determination" of important innovations. In addressing such issues, Turquety lays bare the complex, multi-faceted relation between the history of cinema and the history of technology, where *cinema* is characterized through *technology*, and vice versa.

In the forties and early fifties, an era marked by television and the atom bomb and a cascade of new devices that ushered in the new era of consumerism in the West, Martin Heidegger reflected on the complex relation between technology and humanity. His *Die Frage nach der Technik* [The Question Concerning Technol-

ogy] has become a classic of indisputable value. In "*Technē* and *Poiēsis*: On Heidegger and Film Theory," film philosopher Robert Sinnerbrink assesses Heidegger's (potential) impact on film theory. First of all, Sinnerbrink acknowledges that although Heidegger's philosophy of subjectivity and his re-thinking of the "question of Being" have transformed modern thought, and despite the fact that it is obvious that existential phenomenology, hermeneutics, deconstruction and French poststructuralism all "owe a debt to Heidegger's work," Heidegger appears to be a philosopher who has little to offer contemporary film scholars. After all, he rarely commented on the topic of film. Nevertheless, despite his skepticism concerning photography (and by association, cinema), Heidegger was notorious as a critic of the modern age. In "*Technē* and *Poiēsis*," Sinnerbrink's objective is to show the significance of Heidegger's thought for contemporary film and media theory and the philosophy of cinema by addressing two important facets of Heidegger's view: the "question of technics" in modernity and its meaning for audiovisual media; and the idea of a "Heideggerian poetics" of modern art, "having the poetic power to disclose new horizons and worlds," an idea with substantial implications for re-thinking what cinema can be.

Bernard Stiegler is a philosopher of technology with a keen interest in time. In "Stiegler's Post-Phenomenological Account of Mediated Experience," Patrick Crogan argues that in *Technics and Time* Stiegler developed a substantial critical renovation of phenomenological approaches to experience by focusing on the mediation and transmission of experience through techniques and artifacts. More specifically, Crogan examines Stiegler's notion of the "industrial temporal object." To assess the significance of Stiegler's new theorization of cinema in the context of his wider project, Crogan presents an overview of Stiegler's account of the role played by technics in general (and mnemotechnics, in particular) in the dynamics of human life as a form of "technical life." Digital (including digital audiovisual) media forms having emerged recently, the current period is approached as "post-cinematic," lying between the epoch of analog and digital systems of recording, representation, communication and simulation. Crogan argues that Stiegler's philosophical views on the cinematic experience of "disorientation," and its critical and cultural potentials are invaluable to film theory today, not only because they offer a reconsideration of cinema as a technocultural form that has transformed human life globally, but also because they offer insights into "how the post-cinematic digital media are transforming the conditions of the production of experience today."

Media technologies have saturated the current practices of communication and representation. These technologies urgently demand research from media studies; moreover, a critical reassessment of the ways in which media studies have defined "media" so far. In "What Are Media?" Lambert Wiesing poses the question of how to define media in a provocative way. "When we look at the current state of media studies, we might well think that it may be better not to ask the

question, What are media? but rather, What isn't a medium? Indeed the situation seems to be such that media studies is determined by a rather large number of concepts of media that are, however, equally wide, in part even unlimited." A second problem, as he argues, is that research in media studies is determined "by concepts of media that to a worrisome degree have moved away from the everyday understanding of the medium as a means of communication." (Communication, understood by Wiesing, includes all forms of exchange of information, even representations and the arts.) To demonstrate his point, he analyzes the main theses of the media theories that dominate media studies: the technical-oriented approach of Marshall McLuhan; the system-theoretical approach of Niklas Luhmann; and phenomenological media theories (with elaborate quotes taken from Merleau-Ponty). A crucial problem Wiesing brings forward is the "transparency" of the medium (e.g., Merleau-Ponty's classical example of language: when simply used as a means to transmit meaning, the medium itself will go unnoticed). If "transparency" is taken as a pivotal feature of media, as media phenomenologists tend to do, the notion of a "medium" inevitably is broadened in a problematic way, to include all "means that remain unthematized during their employment." In the second half of his chapter, Wiesing rethinks the notion of "medium" in terms of the classical idea of Husserl's phenomenology, the distinction between *genesis* and *validity*, with remarkable results. First of all, he argues that media are "tools that make it possible to separate genesis from validity." Secondly, he defines media accordingly, as "tools or means that are transparent during their employment; but they are also specific tools that are capable of something that other tools cannot achieve, namely a separation of genesis and validity." Thirdly, he explains the complex notion of "validity" (as used by Husserl) to conclude that media "are precisely those tools that make it possible that not just something *equivalent* but also the *very same thing* can be seen, heard, and thought at different times, in different places, by different people – and this likely is the reason why media can hardly be overestimated in their anthropological significance."

Part II presents a series of reflections on cinema and media technologies, describing and assessing the ways in which the relations between the "hardware," the "software" and the "wetware" are visualized, schematized, hypothesized and conceptualized in current cinema research as well as in past theories. One objective is to explore the impact of particular (new) cinema technologies (e.g., 3D; digital technologies) on audiences in terms of perceptual impact, cognitive processes, affects and emotions. Another objective is to determine if and how new developments of the hardware and new practices of usages may have affected theorizing and how the combined factors of technological, cultural and social aspects have been approached in theories (e.g., on television, on early cinema, on new and digital media) in the last decades. This part of the book opens with a reassessment of the "history of vision"-debate by Annemone Ligensa and a re-

flection on the so-called modernity thesis and early cinema studies. The basic assumptions of the "history of vision"-debate have had a considerable impact on cinema and media research. According to Ligensa, its assumptions are particularly relevant today, because of the similarities between early cinema's historical emergence as a modern, commercial mass medium and our current, global "digital revolution." The assumptions developed in the context of early cinema studies regarding the considerable (perceptual) impact of the cinema machine on viewers – highly influential since the late 1980s – have been challenged by scholars from the fields of cognitive and evolutionary psychology, who argue that perception is biologically determined and thus fairly stable. As Ligensa shows, some scholars have argued that this debate is "mostly due to differences in the definition of 'perception' (the content vs. the process of perception, sensory perception vs. apperception etc.)." Understanding the basic psychological processes of media reception, regardless of their unchangeable or changeable nature, Ligensa argues, is important when studying contemporary or historical audiences. She therefore proposes to take an interdisciplinary stance to the study of media-related behavior, following John L. Sherry's plea for a "neuroscience paradigm" that offers a "systemic model of behavior that would investigate the interaction of biology and culture." The "history of vision"-debate, Ligensa contends, has been fierce and polemics have not always been subtle, but at least it has opened up discussions between scholars from various disciplinary fields which can certainly benefit cinema and media studies.

Ian Christie's chapter on 3D, "Will the 3D Revolution Happen?," offers a detailed analysis of the arguments and positions taken in the 3D debate by critics, viewers and theorists alike, ranging from the recent and substantial defense and promotion by AVATAR director James Cameron, to the fierce and vicious attacks in articles and blogs by Roger Ebert and other disapproving critics, to the very elegant and well-argued pieces on "stereoscopy" in the works of Bazin and Eisenstein. Some crucial questions are: What does 3D (stereoscopy) do exactly? And is what the new 3D technologies can do, or claim to do, effective? Moreover, Is it appreciated by the audiences (who have to pay extra)? Is the new technology put to good use by the directors? Interestingly, both Bazin and Eisenstein, early on, produced rich and highly interesting essays on the topic. These essays are nevertheless relatively unknown, and thus remained understudied in the field of film studies, which is even more surprising as Bazin and Eisenstein are among the best-known and well-read theorists of the cinema worldwide. Christie carefully analyzes Bazin's and Eisenstein's arguments within the context of their work. Besides addressing the current, and perhaps already waning, "3D boom" in cinema, Christie focuses on the late 1940s and early 1950s, a brief period when 3D again successfully emerged in the cinema, in part as a response to the new rival on the scene; the mass medium of television. The very detailed analysis of the development of 3D that Christie explores shows that although the entertain-

ment and leisure industry was initially responsible for the appropriation of stereoscopic technology from the pre-cinema era onwards, unsuspected fields such as medicine and warfare also made use of the technology.

In "Television's Many Technologies: Domesticity, Governmentality, Genealogy," television scholar Markus Stauff demonstrates that research on television provides interesting provocations to existing definitions of technology as found in film and media studies, and most clearly with respect to television's latest transformations, which undermine any clear technical definition of the medium. Technological innovations change and challenge the identity of the medium – but this may be a truth all too obvious, Stauff argues. Hence he proceeds to look at the period where technological innovations and radical transformations perhaps seem less pronounced: the "seemingly more simple television landscape between the 1960s and 1990s." Thus "classic" research on (mainstream) television is a good place to start. Interestingly, however, the everyday medium that came into existence in that specific period, simple as it may seem, Stauff argues, triggers some highly relevant reflections on the question of technology in media development precisely because of its "domestic character." Moreover, as television combines the "day-to-day use of highly complex machinery" with constantly changing connections with *other* domestic technologies, the medium as such poses "quite different questions than the more public use of technology in cinema" or "the mobile always-connectedness of digital media." In his overview, Stauff carefully analyzes the "intricate relationship between technology as technical system, as material object, as social practice, and as techniques of the body."

In "Postmodern Hi-fi vs. Post-Cool Lo-fi: An Epistemological War," Laurent Jullier addresses the question, How can I know, as a spectator of a fictional narrative, what a Napoleonian battle was like? In other words, does a film displaying an 18th-century battle allow the spectator access to a "real" believable knowledge of the world?; and which technological devices does film employ to provide this kind of realism? Thus, Jullier aims to show the way in which the antagonistic cinematic hi-fi and lo-fi apparatuses (high fidelity, low fidelity) are trying to provide some reliable "real" knowledge to the spectator. In a detailed case study exploring the epistemological dichotomy of hi-fi and lo-fi technology, Jullier shows that computer-generated imagery (CGI) is usually associated with the hi-fi device to provide an often photo-realistic bird-eye view of the world, whereas the lo-fi device usually implies the use of a hand-held shaky camera to record the world in a "run-and-gun style" that manages to put the spectator right at the heart of the battlefield. The hi-fi apparatus, Jullier explains, refers to a postmodern *exocentric* type of encoding environment data: "It allows a kind of disembodied experience in order to embrace the wholeness of a scene." The lo-fi apparatus, on the other hand, refers to a, what Jullier labels, "post-cool," *egocentric* type of encoding environment data. These two competing types of encoding are not mutually exclusive, Jullier indicates, as both aim to describe "a scene with the

most possible accuracy." Therefore it should not come as a surprise that hi-fi and lo-fi technologies are more and more intermingled in each new release. Using these devices to achieve "realism" does come at a price, Jullier argues, especially in France, where (orthodox) modernist cinephiles still tend to favor getting absorbed in the diegesis over being wowed by audiovisual excesses they simply do not feel comfortable with. Another threat to the harmony between audience and aesthetic features, Jullier argues, is the ageing of technology. Just as the popular use of zoom-in telephoto lenses of the 1970s, 3D CGI, too, will someday lose its evocative power and become an outmoded device in the history of film style. Thus, the way we interpret technological effects, Jullier explains, "varies through time and depends on cinephile communities." Nevertheless, filmmakers and spectators do not refrain from airing their preferences for "the so-called *lo-fi* or *hi-fi* ways of making images," which in turn leaves film scholars with an array of interesting arguments that phrase these preferences.

Pasi Väliaho opens Part III of the book by recalling that the histories and theories of cinema are in most cases approached in terms of the technology of projection, in line with the pre-cinema tradition of optical spectacles and magic theaters. An alternative conception of cinema is created by the focus on the technologies for the recording of movement as pointed out in the context of the late-19th-century life sciences in particular. Well documented (by Marta Braun, Mary Ann Doane, etc.), it was in this context that pre-cinematic devices such as chronophotographic apparatuses as well as graphic self-recording machines were developed to track down the living object in terms of its dynamic expressions. A whole complex of various kinds of machines was produced to capture and reproduce "movement," which was seen as the essence of life. This series of machines was epitomized by the "chronophotographic gun" Étienne-Jules Marey made in 1882, as Väliaho indicates. In his "Marey's Gun: Apparatuses of Capture and the Operational Image," he explores the alternative trajectory of cinema's history as indicated to account for the medium as a specific kind of apparatus (Michel Foucault, Giorgio Agamben, Jean-Louis Déotte) of knowing and reproducing the moving and the living. He analyzes how cinema and pre-cinematic technologies gave rise to a particular kind of "diagrammatic vision," the function and purpose of which was "to track down, automate, abstract as well as take control of the dynamics of living beings." On a more philosophical level, he discusses the relationships between technology, perception and power, which Väliaho sees in relation to scientific technologies of visualization and modernity's biopolitical project (the notion of "biopolitical" refers to Foucault's idea of the apparatus). Lastly, Pasi Väliaho points out links between the late-19th-century diagrammatic vision and today's screen-based systems of control of populations, e.g., automated machine-perception as well as digital face recognition technologies.

Early Soviet film is in many ways exemplary of *technē in action*, if only because the pivotal figures (Sergei Eisenstein, Dziga Vertov, Vsevolod Pudovkin, Alexan-

der Dovshenko) tended to learn the trade by partaking in the extensive practice of re-editing films made by (often famous) foreign directors (Griffith among them), whose films, regardless of their qualities and reputations, were put back on the montage table and cut in shape before they were found suitable by new Soviet Union's censors to be distributed for screening to post-revolutionary Soviet audiences. Being invited to cut up movies other (brilliant) directors made – was that not considered an avant-garde dream? Moreover, this was part of a variety of ephemeral activities, ranging from alternative screening practices (e.g., film festivals), teaching, publishing, to film collecting, known as film culture today, as Malte Hagener has shown in his study *Moving Forward, Looking Back* (2007). In "Re-editing as Psychotechnique: Montage and Mediality in Early Soviet Cinema," he shows how the specific avant-garde context gave rise to a creative employment of the medium's possibilities. Although in different ways, Vertov and Eisenstein both put the materiality and mediality of film at center stage. Analyzing them from this perspective, Hagener argues that Eisenstein's [early] thinking on montage "can be summarized as a series of ideas on psychotechnics and biomechanics related to how film technology and mental activity intersect." Hagener mostly focuses on the years directly after the Russian revolution, 1919-1924, just before Eisenstein, Pudovkin and Dovshenko "suddenly and seemingly out of nowhere bursts onto the scene." The cases and context Hagener presents here allow him to "to rethink the nexus of style and technology as a complex negotiation in which neither side dominates the other, thus avoiding any kind of determinism."

The Italian film theorist Francesco Pitassio devotes his attention to the interwar period in Italy, more specifically the "technophobic" tendency in Italian film theory in the 1920s and 1930s triggered by, or feeding on, Italian idealism. In "Technophobia and Italian Film Theory in the Interwar Period," Pitassio states that Italian film scholars of the interwar period were "technophobic" in that they feared the effects of technology. Their attitude stands in sharp contrast to the keen interest in cinema's technological innovations eagerly discussed within early European film theory (certainly in the 1920s) at large; one need only think of the French debate on *photogénie* or the Russian debate on montage. As opposed to this, Italian film theorists according to Pitassio shied away from the European technology debate by framing their theories in terms of the mainly idealist premises and concepts handed to them by the prominent Italian philosophers of the time. Moreover, Italian film theorists tried to define and examine cinema within the broader context of media systems as an apparatus belonging to modern life. In addition to previous research done on the period, Pitassio aims at providing an in-depth analysis of the institutional, philosophical and political frames which determined Italian film theory in relation to technology in the interwar period.

Video is perhaps the technological invention of the post-war era that was to affect the field of film studies more than any other technology, if only because it gave the field a device to easily rewind and reassess films for the first time in its

history. In *Death 24x a Second* (2006), Laura Mulvey already reflected on its profound and lasting impact on the field, cleverly alluding to Jean-Luc Godard's use of video in her book title. His masterpiece of the early 1980s, HISTOIRE(S) DU CINÉMA, has the ominous subtitle *Cogito ergo video*. Even though his transformation of the Cartesian phrase – "*Cogito ergo video*" – is sometimes considered humorous, as Godard-expert Céline Scemama argues in this book, it is nevertheless a founding principle for him and his film provides a discourse on his method. How could one present a history of the cinema before the existence of video? How to collect, select, assess, play and rewind all the fragments that make up the history of the cinema (for Godard)? How to creatively play with the new possibilities video allows and invites? In part, HISTOIRE(S) DU CINÉMA is Godard's reassessment of the relations between *technē* and *poiēsis* in the field of film. Many philosophers and film theorists reflected on the topic before him and many of them are referred to by Godard. One of them, Béla Balázs, referred to here by Scemama, once wrote, "Technological inventions bring the idea of a new art form. But once the idea exists, [...] it inspires technology in turn, gives it a direction and a specific mission." Scemama argues that what matters is not so much whether Godard's interest in new technologies put him ahead of his time, but rather the way in which he instantly thought of using them to serve his outlook on the times.

In "Performativity/Expressivity: The Mobile Micro Screen and Its Subject," Nanna Verhoeff and Heidi Rae Cooley reflect on the performative and expressive qualities of current-day technologies such as mobile screens that presently saturate private and public life and their impact on the subject. They ask themselves, in what way performativity and subjectivity are central to an understanding of technology. Their reflections are informed by a tradition of cinema and visual culture studies on the one hand, and science and technology studies and new materialism on the other. In order to theorize new media technologies and related practices, Verhoeff and Cooley mobilize Peircean semiotics in their exploration of the performative and expressive features of ubiquitous mobile technologies. They argue that it is in these performative and expressive inscriptions that technologies have cultural, social and historical embedding and meaning. In their chapter, they explore how the specific "dispositif of mobility," and the "fluid spatio-temporality of emergence" – which they see as the underpinnings of the new "visual regime of navigation" created by mobile screens – require that theorists and media scholars acknowledge that technologies, practices and subjects are now in a particularly dynamic relationship.

Part IV is devoted to two discussions, one on Friedrich Kittler as a major media theorist, who had a considerable impact on the field of film studies and the young discipline of media archaeology; and a second discussion on Christian Metz and his so-called "apparatus theory." These discussions have the form of a dialogue. "Rethinking the Materiality of Technical Media: Friedrich Kittler, *Enfant*

Terrible with a Rejuvenating Effect on Parental Discipline" presents a dialogue with media expert and Kittler translator Geoffrey Winthrop-Young. The second dialogue, "Revisiting Christian Metz's 'Apparatus Theory,'" presents a discussion with film theorist and Metz expert Martin Lefebvre, who has had access to the Metz archive since 2008 and is able to consult Metz's personal writings to contextualize the apparatus theory. These two dialogues are meant to discuss and reassess the work of these two major thinkers and their productivity for film and media studies today. For further introductions, see the beginning of Part IV.

In Part V the future of film and media studies is envisioned in two radically different chapters. The first one is written by André Gaudreault and is entitled "The Future History of a Vanishing Medium." In a playful, tongue-in-cheek way, he reflects on the so-called "digital revolution" and the question of the "death of cinema," which is announced and mourned each and every time a major new technology presents itself in the field to rival the cinema. Gaudreault specifically aims at envisioning the possible impact on future film historiography by the announced disappearance of celluloid under the influence of the current digital revolution of which we have not yet seen the end. "*We too are also in the midst of a process of mutation.* We as *film viewers*, but also as active members of the small community of *film studies scholars.*" The question is: How profoundly will the cinema change and how will cinema studies change in its wake? Gaudreault's analysis and vision are voiced by a stand-in of a younger generation, who speaks to us from a distant point in the future.

The last chapter in this book, "Experimental Media Archaeology: A Plea for New Directions," is written by media historian Andreas Fickers and me. It envisions a future for film and media studies in the form of a plea. Acknowledging that media studies and the young discipline of media archaeology have done important work to put the study of media on the map in the humanities, and that media-saturated life at this point in time implores researchers to address important media-related questions head-on, we plead for a further step in terms of studying the materiality of media. Inspired by the idea of historical re-enactment, we provide a theory and a method to study media practices and the ways in which use is inscribed in media head-on and hands-on. We envision ways not only to close the gap between media studies in the humanities and the sciences, but also to use the immense collections of media apparatuses (*l'appareil de base*) waiting in film and other archives for further research. Ultimately, we would like to initiate and stimulate a dialogue between the academic community of film and media scholars with engineers, curators, archivists and the millions of media amateurs, collectors and other technical experts who wish to share their expertise and knowledge in online platforms and home pages.

PART I

Philosophy of Technology: Reassessing Key Questions

The Philosophy of Technology in the Frame of Film Theory: Walter Benjamin's Contribution

Dominique Chateau

Many contemporary authors have been preoccupied by theoretical issues related to the context of media that has surrounded us since the beginning of the digital era, and because of which we will experience a period of transition that will last as long as digitization keeps developing and involving more and more aspects of our daily lives. However, what has already been changed and established provides a good basis for certain conjectures. One may wonder, for instance, if the new set of facts and ideas related to such technological transformations could possibly contribute in turn to the transformation of film theory and some of its key concepts. The persistence of cinema is indeed obvious: films are still being made as audiovisual works destined to entertain audiences, among other functions. It is nonetheless just as obvious that the digital revolution has had an important impact on this persistence.

In the following, I will try to show how Walter Benjamin's well-known essay, "The Work of Art in the Age of Its Technological Reproducibility," can provide a serious ground of discussion for this issue, as it contains answers to a large number of questions raised by it. This does not mean that it would suffice to directly apply Benjamin's propositions to the current situation. Indeed, those propositions have been regularly re-evaluated, not only with regard to their internal logic, but also to their degree of relevance in the light of the different time periods in which they were reassessed. A collection of texts entitled *The Work of Art in the Digital Age*[1] examines Benjamin's arguments one by one and re-evaluates his propositions in the light of our digital modernity. I, for one, have given the aura concept a close examination, along with the argumentation from which it came.[2] This led me to be more attentive to the concept of aestheticization and to realize that my opinion was not so much altered by the value of those previously studied arguments as it was by the viewpoint from which they had to be examined.

I then thought it would prove advantageous to abandon a strictly linear reading of "The Work of Art in the Age of Its Technological Reproducibility" and rather

consider the text as a network of concepts, whose interrelations offered an exemplary – and by no means intangible – matrix, which could be used to interpret the consequences of the invention of cinema and the advent of the digital revolution. This being said, I am fully aware that studying this text requires certain transpositions, which a simple analysis of its title might already reveal, as my topic is not so much "the work of art" as films in general. Nevertheless, it is significant that Benjamin, instead of limiting the scope of his study to artistic films, takes into account the birth of new art forms, or at least of new more or less artistic forms of production which appeared in the context of the democratization of culture and its accessibility to the masses. Neither is my topic about "technological reproducibility" – if reduced to analogical processes, at least – but about digital technology, which still involves analogy at the same time as it is based on a generalized digital coding of visual and auditory signals, since the digital transmission of a signal does not prevent the latter from appearing on a screen and, as such, requires a visual transcoding system and, for the viewer, an analogical decoding process.

Last of all, when considering "Benjamin's text," one must think of it as a palimpsest, and not a single finished work. Indeed, which specific text is one considering exactly? One of the two existing German versions or their French counterpart? All the versions were written in 1935-1936 and present very slight variations – whether small lacunas or alternative formulations. For convenience's sake, I will mainly be referring to the second version of the text – unpublished during the author's lifetime – translated by Edmund Jephcott and Harry Zohn, as it appears in the collection of Benjamin's texts published by Harvard University Press.[3] I will also be quoting from Benjamin's own version in French, "L'Œuvre d'art à l'époque de sa reproduction mécanisée," in the Gallimard edition enriched with paralipomena and variations, from "The Work of Art in the Age of Mechanical Reproduction," Andy Blunden's translation of this French version[4] and, at last, from the French translation, which presents the German version of the text in its most complete form.[5]

The Benjaminian Matrix

Benjamin's essay is one of those singular texts which give the impression of being written as one reads along. Hence the feeling of rediscovery one gets at each rereading, because of some previously unnoticed difficulty or brilliant new idea. To my eyes, weary from pouring over "The Work of Art…" so many times, this feeling is due to the fact that Benjamin's text not only accumulates a large number of ideas, not only interlaces a great number of themes in a sometimes chaotic argumentation, but also superimposes and disseminates several types of reflection one seldom finds associated with one another. The Reader may feel somewhat discouraged by the first part of the text – presented as a Preface in

certain versions – which seems to set him/her on a dubious path leading to the commonplace Marxist concept of the relationship between infrastructure and superstructure or, more simply put, of the relationship between culture – or art – and production. The reader may also be annoyed by the militant undertones which can be felt in the first pages – regarding the "revolutionary demands in the politics of art,"[6] as opposed to those advocated by Fascism – and in the book's final part – sometimes presented as an epilog – where, as an antidote to the aestheticization that Fascism is once again accused of, we find the proclamation: "Communism replies by politicizing art."[7]

It is obvious that such readers, judging the text in the light of their ideological prejudices – as they may well be antifascist and not necessarily Marxist – is liable to put down the book and read no further. That, however, would be a shame. Actually, any reader – whether ideologically biased or not – could be justified in feeling such discomfort: it is normal to see a divergence of opinion between one who looks at a glass as half-full and one who considers it half-empty, and it is above all the many difficulties contained in the first few pages that might be held responsible for the reader's skepticism. The militant undertones we mentioned above accompany the first difficulty one comes across, as the book's first theme – reproduction – is explored. The lateness of culture as compared to production is here mentioned in reference to the "capitalist mode of production" and the economic system of capitalism, which the "thesis defining the tendencies of the development of art under the present conditions of production"[8] should be connected to. What is at stake here is no less than the renewal of art theory, a renewal which Benjamin wields as an antifascist weapon. Epistemology and ideology thus merge in a way that may seem irrelevant to an upholder of epistemological neutrality, and superfluous to an antifascist activist. The reader who dislikes questions of ideology will of course be reassured once the preface is over, as the political theme of capitalist production makes way for the technological issue of reproduction. In fact, it is precisely such a shift that the same reader – a bit fussy on epistemological matters – might want to criticize.

Instead of trying to carry out an autopsy of Benjamin's text, one should endeavor to do justice to its persistent dynamism and accept its countless shifts from one form of argumentation to another, inasmuch as they succeed in simultaneously establishing the dialectic of the text on several planes: that of technology and media theory, of art and cinema, of the history of human production, of cultural history, and finally, that of politics, both as theory and *praxis*. And here is our matrix, so to speak... As far as politics is concerned, one should also bear in mind the dramatic context with which the author was confronted at the time, and remember the odd analogies that Horkheimer and Adorno, while living in exile in the United States, both noted between the situations in their host country and that in Germany: the analogy, for instance, between the radio broadcasting of concerts conducted by Toscanini and of the Führer's speeches.[9] Retrospec-

tively, it is in no way surprising to observe that Marx and Engels, when they prophesized an end to the division of labor and announced that "in a communist society, there are no painters but at most people who engage in painting among other activities,"[10] gave us a foretaste of the current postmodern discourse which keeps harping on about the fusion of art in the realm of culture, the advent of which, paradoxically enough, is considered as a result of the development and triumph of our liberal-capitalist society!

To the multidisciplinary matrix of the various intellectual modalities through which Benjamin's thought progresses, there corresponds the matrix of the themes which he tackles with remarkable freedom and an intellectual luxuriance that probably explains the fascination that Benjamin still exerts over us. Four main notions can be distinguished: first, *technology*, along with its modes – reproduction included – and effects; secondly, *aura*, taken as the central concept of an art theory in the process of being reformulated – given its former importance and acknowledged decline; *art for the masses* (and especially cinema), considered as a cultural dominant feature gradually replacing the traditional definition of art – as in the status of painting, for instance; finally, in Benjamin's own terms, *aestheticization*, which, in a singular and striking way, includes the metamorphosis of superstructure submitted to the influence of political forces that have integrated the aesthetic function in the representations they manipulate. All four notions will be developed here, although unevenly, while bearing in mind the indefectible ties that bind them to one another inside the Benjaminian matrix.

The Question of Aesthetic Values in Front of Technology

While dealing with the issues that Benjamin – after Marx – chose to deal with, one tends to oscillate between the diagnosis and the prognosis. Greek physicians used to content themselves with anticipating disease outcome – recovery or death – for lack of adequate diagnoses. The latter indeed require certain material conditions – a stethoscope, for instance – and a sufficient amount of time for their consequences to be effective. When applied to our topic, this idea translates into the famous theme of the lateness of superstructure as compared to infrastructure. According to Marx, the question is not of knowing why such an art form exists in such historical condition defined by such mode of production, but why the art of the past – Greek art, for instance – still provides pleasure in the industrial era.[11] According to Benjamin, the time has come to establish the diagnosis of the transformations of culture – that is, to forge the concepts of a new theory of art.

This is why, in the beginning of his essay, Benjamin quotes from a text by Paul Valéry, "The Conquest of Ubiquity,"[12] where the French poet examines the future of art in the light of a daring hypothesis regarding technological innovations. Benjamin was undoubtedly interested in the fact that Valéry prognosticated the

metamorphosis of art along with the invention of a new kind of device, the main function of which was to enable remote data transmission – a sort of television, in fact: "Just as water, gas and electricity are brought into our houses from far off to satisfy our needs in response to a minimal effort, so we shall be supplied with visual or auditory images, which will appear and disappear at a simple movement of the hand, hardly more than a sign."[13] Regarding such transformation of art, Valéry's proposition already contained the seeds of a theory of the dematerialization of artworks, that can "appear and disappear at a simple movement of the hand" – as when one uses a remote control! – and, more generally, "will not merely exist in themselves but will exist wherever someone with a certain apparatus happens to be."

Valéry also wonders if "a philosopher has ever dreamed of a company engaged in the home delivery of Sensory Reality." Indeed, such a poetic and philosophic dream appears to come straight out of a science-fiction story, but it is nonetheless significant that, through the type of vocabulary he uses, Valéry indicates that his hypothesis, instead of being presented as a mere fantasy sprung from his imagination, is related to real, concrete technological properties appealing to our senses. In the extract quoted by Benjamin,[14] Valéry mentions "a *physical component* [...] which cannot remain unaffected by our modern knowledge and power" and claims that "it will be possible to send anywhere or to re-create anywhere *a system of sensations*, or more precisely *a system of stimuli*, provoked by some object or event in any given place." He also adds that "we shall find it perfectly natural to receive the ultra-rapid variations or oscillations that our *sense organs* gather in and integrate to form all we know."

If Benjamin only quotes a short fragment from Valéry's text, it is nevertheless obvious that he is bearing in mind the text as a whole, and more specifically three of its main themes: the invention of a transmission device, the changes brought about in the sensory relation of human beings to the world, and the transformation of art. One may even add that the arguments displayed in "The Conquest of Ubiquity" proceed from earlier ideas outlined in some of Valéry's previous texts. Regarding the issue of sense and sensibility, it appears in two contexts concerning the definition of aesthetics. First of all, during a discussion questioning the relevance of this discipline hypothetically defined as "a Science of the Beautiful," Valéry condemns the Beautiful, which he considers as "a kind of corpse" that "novelty, intensity, strangeness, – in a word, all the values of surprise have supplanted," and declares: "People are more and more occupied with the most unstable and immediate characteristics of the psychic and sensitive life."[15]

This translation poses a problem regarding an issue that Benjamin enables us to grasp more fully. According to Valéry, the Beautiful was supplanted by "*valeurs de choc*": why not translate *choc* as "shock" instead of "surprise"? This would indeed imply a semantic field including not only surprise, but also emotion and, most importantly, a wide range of relations to the world involving the physical

fact in itself – whether electric discharge, vehicle collision or, in the medical realm, all types of trauma. "The sense of shock is as much a sense of resisting as of being acted upon. So it is when anything strikes the senses. The outward excitation succeeds in producing its effect on you," writes Charles S. Peirce while defining "struggle," his second phenomenological category.[16] Benjamin most spectacularly relates Dadaism to film, and both of the latter to the sense of shock:

> From an alluring visual composition or an enchanting fabric of sound, the Dadaist turned the artwork into a missile. It jolted the viewer, taking on a tactile quality. It thereby fostered the demand for film, since the distancing element in film is also primarily tactile, being based on successive changes of scene and focus which have a percussive effect on the spectator. *Film has freed the physical shock effect – which Dadaism had yet wrapped, as it were, inside the moral shock effect – from this wrapping.*[17]

Leaving tactility aside – a theme we shall come back to later – it is interesting to note that Benjamin – although unconsciously – draws on the vocabulary of firearms to describe the shock produced by images. Neither the French verb *filmer* nor the German verb *filmen* have the polysemous meaning of the English *to shoot*: hence the metaphor of the gangster shooting at the audience in the last shot of THE GREAT TRAIN ROBBERY (Edwin S. Porter, 1903), or the ambivalence of the title of John Ford's film, THE MAN WHO SHOT LIBERTY VALANCE (1962), which, as Jean-Louis Leutrat observes,[18] can be either translated as "the man who *killed* Liberty Valance" or "the man who *filmed* ...," and may thus be said to refer to the duel between James Stewart and Lee Marvin – shown twice, but each time from different camera angles – as well as to John Ford himself.

Moreover, in a note, Benjamin once again corroborates Valéry's theory by his use of the vocabulary of shock to distinguish the activity of the film spectator and that of someone looking at a painting, and to link such activity to the "profound changes in the apparatus of apperception" experienced by all "in big-city traffic" or while struggling against "the present social order":

> The image on film-screen changes, whereas the image on the canvas does not. The painting invites the viewer to contemplation; before it, he can give himself up to this train of associations. Before a film image, he cannot do so. No sooner has he seen it than it has already changed. It cannot be fixed on. The train of associations in the person contemplating it is immediately interrupted by new images. This constitutes the shock effect of film, which, like all shock effects, seeks to introduce heightened attention. *Film is the art form corresponding to the pronounced threat to life in which people live today.*[19]

The "Technesthesic" Viewpoint

In his inaugural lesson at the Collège de France in 1945, a context in which the question of aesthetics was accepted at face value, Valéry suggested dividing into two categories the books in his library dealing with this topic: "poietics," on the one hand, which would include "everything that has to do with the production of artworks," and "esthesics," on the other, which would include "everything relating to the reception of artworks."[20] Born from the substitution of the letter "s" to the letter "t" in "esthetics" (or "aesthetics"), the word "esthesics" (or "aesthesics") – coming from the Greek *aisthesis* – enables one to perceive, within the eponymous discipline itself, whatever relates to sensation, sense perception and sensibility[21] – even though the ancient Greeks also used the word to designate intellectual perception. If Plato is above all famous for subordinating the sensible world under the intelligible world, he also offers us one of the most striking occurrences of sensibility-related *aisthesis* in the *Apology of Socrates*, when wondering if a dead man, being deprived of all forms of *aisthesis*, has absolutely no existence at all, or if he passes to another level of existence, therefore migrating from this world to another.[22] It should be noted as well that the concept of *aisthesis*, even though it was not always given priority in the epistemology of aesthetics, nevertheless played an important role in the 18th century. At this time Christian Wolff – who distinguished sensibility from understanding, as he held the former as inferior to the latter – initiated the acknowledgement of sensibility as such, and of its specificity as a faculty in itself. In his *Psychologia empirica* (1732), Wolff already made way for the creation of a scientific discipline devoted to this inferior faculty.[23] Baumgarten took a step further by naming *Aesthetica* the "science of sensual cognition" in 1750. Although Kant, in his First Critique, seemed to follow in Baumgarten's footsteps with his concept of "transcendental aesthetics" (which he defined as "the science of all the principles of sensibility *a priori*"[24]), he nevertheless demoted Baumgarten by breaking off with what he deemed to be a flaw in the latter's method: inducing the principles of empirical experience, instead of searching through the faculties of the mind.

Concerning modern and contemporary artistic forms, a return to Baumgarten is now often advocated, along with the further development of the concept of esthesics. Of course, this concept may be considered strictly in terms of reception: in "L'infini esthétique," Valéry explains that the purpose of art is the endless stimulation of sensibility, as opposed to ordinary sensations – such as, for instance, the feeling of hunger that dies down after eating.[25] However, "The Conquest of Ubiquity" also suggests we pay close attention to the properties of the transmission device imagined by the writer, insofar as it has an impact on human sensibility. In the light of what has already been said about shocks, we may formulate the hypothesis that such an impact will initiate a new mode of perception, or, better still, that each technology has its own sensible characteris-

tics, which lay the accent on the sensory data they select and process, as much as on the way our own receptive device integrates them. Esthesics may thus be differentiated according to the various reproduction technologies: there exists an "esthesic experience," says Edmond Couchot, based on the properties of technologies which "are not only modes of production," but "also modes of perception, and essential forms of representation."[26] The esthesic experience hence becomes "technesthesic," which may be seen both as a differentiation within the field of sensibility and as the enlargement of the latter, as exemplified by digital art.

Technesthesics – to use Couchot's neologism – is a central theme indeed for Benjamin who, at the end of "The Work of Art...," mentions "the artistic gratification of a sense of perception altered by technology,"[27] regarding the glorification of war by Fascism and Marinetti – which brings to light how the different themes in his matrix are constantly intertwined, and how each new stage of his intellectual quest echoes the different steps that led to it. It is the theme of aesthetization that, at the end of the essay, condenses all the rest, and it is in the light of aesthetization that the link between esthesics and politics clearly appears. For the time being, it is interesting for us to question the relevance of the emphasis laid on technesthesics, leaving aside the confirmation brought about by the concept that Couchot came up with in the context of his research on new technologies. We may thus postulate that there exists an esthesic difference between video and cinema, and between digital technology and cinema, in the same way as there exists such a difference between photography and cinema, this difference being of course more or less subtle: indeed, the gap which separates the dynamism of film from the stasis of photography is probably wider and more present than that which separates video and cinema. Yet, whatever the degree of difference might be, the esthesic factor acting on the constitutions of the various technologies also modifies the way those technologies filter and alter reality when recording it – this being said, without even taking into account the specificities of "augmented reality" and computer-generated imagery. The fixity of pixels in a digital rendering, for instance, differs from the tremor of photographic grain on celluloid film.

The technesthesic issue is not only a chapter of technological explanations one might find in a professional handbook; its historical and anthropological impact is highly characteristic of Benjamin's thought: "Just as the entire mode of existence of human collectives changes over long historical periods, so too does their mode of perception. The way in which human perception is organized – the medium in which it occurs – is conditioned not only by nature but by history."[28] It is in such light that Benjamin relates the decline of the aura to social causality.

Reproduction and Art for the Masses

Returning to the inaugural theme of reproduction, when Benjamin leaves temporarily aside the general Marxist theme of the means of production developed by man to consider – more prosaically, as it were – the technological means of production. In the late nineteen-sixties, in France, there was a debate about the ideological impact of such technological means of production in themselves, a debate which presented the double risk of lapsing into determinism, on the one hand, and of failing to explain how representations could invest neutralized technologies, on the other. This discussion could have led to a fruitful outcome if it had drawn upon some of Benjamin's concepts. Most curiously, however, Benjamin was kept away from the debate, in spite of his – indeed critical – attachment to Marxism. In a similar way, the debaters criticized Bazin's ontological realism without realizing that Benjamin had preceded them with his precise analysis of cinema as a reproductive art based on illusion. What enables Benjamin to steer clear of the two risks mentioned above is the fact that, while relating the technological and ideological levels, he involves – implicitly at first, then more blatantly – the basis that technology represents, not only as such – the characteristics of the reproductive arts in themselves – but as an essential part of the superstructure – culture – which, instead of being reduced to the all too simplistic theory of reflection, is conceived of *as a support and modality for social behaviors.*

It is well-known that Benjamin considers two facts as being of paramount importance: firstly, the advent of the mechanized reproduction of artworks – that of a painting on a poster, for instance; secondly, the emergence of arts of which the production technology *is* reproduction itself – namely, photography and cinema. Art for the masses, as a theme, is the direct outcome of this first-level reproduction process: indeed, if reproducing a work of art – from a technological point of view – amounts to degrading the original by turning it into a copy – through which the original loses its aura – this already implies the possibility of a massive distribution of copies. In other words, the recession of the artwork's aura and the emergence of mass diffusion are simultaneous correlative phenomena that proceed from technological innovation and also participate in the causality surrounding the latter.

In a text on the advent of the watermill in the Middle Ages – taken from a 1935 journal directed by Lucien Febvre and given over to the history of technology[29] – the French historian Marc Bloch observed the discrepancy existing between a technological invention and its concrete application: "the watermill, invented in Antiquity, is medieval regarding its actual expansion." Marc Bloch defended a theory of a relationship between the technological and social realms, according to which "an invention spreads only if it is the object of a large social necessity."[30] In the same issue, Bloch discussed Lefebvre des Noëttes's thesis, according to which inventing the collar harness instead of the throat-and-girth harness

– which caused severe injuries to horses – would have led to the decline of slavery. Bloch applied the same principle as stated above and suggested to invert the causality, arguing that when "modern harnessing entered history [in the 10th century], the great social revolution was already over."[31] Regarding the invention of watermills, the controversy is to this day unresolved – as Roman watermills were found at a later stage, for instance. This ancient topic serves our present purpose insofar as it emphasizes the complexity of the relationships between technology and the state and transformations of society.

One must beware of causalism, especially when it attributes to technological evolutions an automatic effect on social transformations. Such causalism is responsible for the fantasy induced by the threat of disappearance – that of cinema, for instance. One becomes even more rigorous when one enters a systemic representation and therefore transcends this simplified type of causalism which merely relates one phenomenon to another. Regarding the impact of audiovisual technological innovation on the history of film, it consists in a theory of complex systems defined by a plurality of factors, whether technological, industrial, sociological, aesthetic and so forth. This theory of systems appears clearly when one correlatively considers the advent of television, movie theater attendance levels, the broadcast of movies on television, the appearance of multiplex theaters in shopping malls, the advent of new media – such as VHS or DVD – and new means of broadcasting – mobile phones, video on demand, Internet – movie theater economics, the recession of the celluloid film industry in a context of growing digitization, or the perspectives offered by stereoscopic 3D technology. In any event, and notwithstanding such technological and economical mutations, cinema has apparently endured – at least until now – as a form of collective entertainment.

How does Benjamin develop his own idea of historical relativism with regard to the technesthesic theme? With a leap into the past, which verges on the same anachronism as can be found in my earlier reference to Marc Bloch:

> The era of the migration of peoples, an era which saw the rise of the late-Roman art industry and the *Vienna Genesis*, developed not only an art different from that of antiquity but also a different perception. The scholars of the Viennese school Riegl and Wickhoff, resisting the weight of the classical tradition beneath which this art has been buried, were the first to think of using such art to draw conclusions about the organization of perception at the time the art was produced.[32]

One may of course wonder about the presence, in a reflection on cinema, of such references to an early-6th-century manuscript – the oldest Bible codex still preserved – and to Riegl and Wickhoff, two eminent members and founders of the Vienna school of art history in the late 19th century? The link, in fact, can be

easily established: Benjamin paid close attention to both authors because he was highly interested in their idea on the emergence of a *Kunstindustrie* – an art industry – in the Late Roman Empire, as explained in Riegl's *Die spätrömische Kunstindustrie* published in Vienna in 1901. This also reminds one of the importance the art historian attached to the concept of *haptik* – haptic, tactile – a fruitful idea that circulated from Riegl's thesis on the historical evolution of sensibility from haptics to optics ever since Egyptian art, to the haptic interfaces in the field of virtual and augmented reality, via J.J. Gibson's theories on texture perception and Gilles Deleuze's study of Francis Bacon.

While dealing with the theme of shock, we have already observed the influence of the haptic or tactile concept on the development of "The Work of Art in the Age of Its Technological Reproducibility." Shock characterizes the fact of moving closer to an object, instead of watching it from afar. This can also be observed in the paradigmatic opposition Benjamin establishes in the next paragraph, when he presents – in a classical way – the *paragone* of painting and cinema:[33]

Painting	**Cinema**
Concentration	Distraction
Devotion	Entertainment
Absorption by the work	Absorption of the work
Optical	Tactical
Contemplation[34]	Habit

In this excerpt, the author shows a hesitation that can be found all through the text, and even all of Benjamin's writings, where distraction is in turn presented in a positive or negative way. On the one hand, Benjamin criticizes the underlying ideology of the paradigm of painting, notably by accusing the distraction/concentration opposition of being "commonplace."[35] On the other hand, by pushing his analysis further, he expands the paradigm and seems to justify its pertinence. This is a crucial point for understanding Benjamin's thought and its relevance to contemporary debates. Whereas certain authors refer to his thought in the defense of new technologies, which they claim to valorize by emphasizing the decline of the notion of art, others denounce the fact that, by using the very means he criticizes, he does not succeed in parting with an outdated conception of art and culture.

Such controversy will be put aside, not being the purpose of this essay, and we will return to one of the most interesting features of Benjamin's analysis, namely the reference to the tactile. We may once again observe the fecundity of Benjamin's indirect approach and detour via architecture. Someone contemplating a painting, says Benjamin, "is absorbed by it," whereas "the distracted masses absorb the work of art into themselves."[36] He also adds: "Their waves lap around it;

they encompass it with their tide. This is most obvious with buildings. Architecture has always offered the prototype of an artwork that is received in a state of distraction and through the collective." Once again, Benjamin bases his considerations of cinema on a kind of genealogy of art: whereas other art forms – such as tragedy – have declined – and as far as painting is concerned, "nothing guarantees its uninterrupted existence" – Benjamin underlines the anthropological permanence of architecture, and that of the "need for shelter." Hence the idea of presenting architecture as a model for technesthesic definition – "buildings are received in a twofold manner: by use and by perception," "better: tactilely and optically" – all the more so as, in our relationships to buildings – apart from the touristic relationship – the tactile characteristic imposes itself upon the optical dimension: "Tactile reception comes about not so much by way of attention as by way of habit." In fact, this also characterizes the activity of "the human apparatus of perception" in those crucial tasks humanity must fulfill, as well as it conditions the attitude of absent-mindedness – meaning that we generally better succeed on a task without thinking too much about it – and concerns art itself which, by becoming an agent of habit and mass mobilization, "finds in film its true training ground."[37] If a film is endowed with such technesthesic power, it is "by virtue of its shock effects," those multiple interruptions of its visual or audiovisual continuum: a "constant, sudden change" breaking up "the spectator's process of association."[38] Hence the following paradoxical celebration of the theoretical role played by cinema: "In this respect, too, it proves to be the most important subject matter, at present, for the theory of perception which the Greeks called aesthetics."[39] Architecture, for all time, and cinema, for the present, are the models of technesthesic thought.

The Singular Case of Cinema

Benjamin's detour via architecture gives us a clear idea of how his thought progresses. His digressions have sometimes been considered as a breach of logical rationality. However, such detours generally indicate that Benjamin was searching for a mediation in the development of his reflection, a mediation which he very often sought in history. Benjamin's digressions are "passages" – a word which instantly brings to mind the "dialectical fairyland" of his study of the Paris arcades,[40] even more so as one of the main theses of this study is the inversion of the relation between history and the present: namely, moving from history to the present – in this specific case, from architecture to cinema – instead of looking back at history in the light of the present. Apparently, Benjamin avoids making the recurring mistake so typical of postmodern thought, which consists in making a clean break with everything that preceded, on the pretext of the so-called cultural and theoretical superiority of a modernity that keeps on repeating itself along the metamorphoses of history and, from one modernity to the next, is like

an endless elevation toward an ever-receding peak. When considering those successive modernities one should, on the contrary, turn to relativism. That which is at stake here is the idea that such topics as the watermill and the art of the Late Roman Empire are not obsolete references but historical moments where the theoretical issue of the relationship between technology and society was already present. In a similar frame of mind – after Baudelaire defined the notion of modernity which characterized the second half of the 19th century – Stendhal rightly claimed that the Greeks had their own modernity.[41]

However, reaching such a consciousness of modernity – through the creation of the word and invention of its concept – also indicates the possibility of an actual ideological progress from one historical period to the next. Benjamin observes that both art historians Riegl and Wickhoff had a limited viewpoint – being restricted to formal characteristics – that did not enable them to see the "the social upheavals manifested in these changes in perception,"[42] whereas "today, the conditions for an analogous insight are more favorable." And Benjamin adds: "if changes in the medium of present-day perception can be understood as a decay of the aura, it is possible to demonstrate the social determinants of that decay." In this case, he clearly seems to be leaning toward Marc Bloch's social determinism. Indeed, he draws upon certain theses elaborated in his own *Little History of Photography*[43] to depict the decline of the aura by photographic reduction as a consequence of "the increasing emergence of the masses and the growing intensity of their movements."

There are in fact two levels concerning such causality: firstly, that of the consequences directly deducible from technology which, as it happens, induces a relationship of proximity to the object and the mastery of its unicity, as opposed to the relationship to nature, that "unique apparition of a distance, however near it may be";[44] secondly, that of a referential social system in which such modes of relation to reality operate at the same time as new technologies are being implemented. Although it appeared long after Benjamin's time, the word "technology" is most appropriate here, insofar as it introduces an intellectual dimension – with the suffix *-logy* – that adds up to the technical meaning of the word. In the defense of mechanical arts he presented in his *Encyclopedia*, Diderot already declared that "every art has its speculative and its practical aspect"[45] – the word "art," at the time, like the Latin word *ars*, was an approximate equivalent of the Greek *technē*. At any rate, what matters above all is to integrate the theory of its application into technology itself, and not reduce this theory to a *modus operandi* imposed by technology by expressly taking into account the sociocultural conditions that surround the latter. Consequently, the return of a haptic relationship in the realm of smartphones, tablet computers and computers in general pertains to some technological innovation and the frantic quest for novelty in the competitive context of a ruthless market, or even with regard to the "genius" of such and such computer engineer. However, it is also highly plausible that this return to

tactility, to a sense of contact, has to do with the state and evolution of our so-called postmodern society.

In an article from *The Guardian* covering the exhibition "Postmodernism: Style and Subversion, 1970-1990," which took place at the Victoria and Albert Museum in London, in September 2011, Hari Kunzru observes that the word "Internet" has largely replaced "postmodern" in the most frequent Google occurrences, which he interprets as a sign announcing the return of the exciting fantasies of postmodernism in everyday reality: "It's as if the culture was dreaming of the net, and when it arrived, we no longer had any need for those dreams, or rather, they became mundane, part of our everyday life. We have lived through the end of postmodernism and the dawning of postmodernity."[46] In fact, in the field of contemporary art – architecture, fine arts, music and dance – the postmodern ideology still decides who will be designated "a candidate for appreciation," as George Dickie once put it. However, until further notice, there is one art that has managed to resist the postmodern wave and the alleged normalization brought about by the Internet: the art of film. Its resistance regarding both its form of existence and modes of presentation is indeed a remarkable fact. Whereas contemporary art produces devaluated works – in the sense of autonomous forms – cinema still produces feature films and probably has the chance of remaining unashamed of the artworks it gives rise to! It is indeed remarkable that this may still be the case, despite the technological mutations, new modes of access to images and the popularization of the Internet, which obviously have an impact on cinema by opening the latter to new forms of practice.[47] This is one aspect of the reflection on causality that deserves to be further looked into, notably regarding a film's mode of presentation – that of a projection in a dark room – and, beyond that audiovisual assemblage through which a film is made, that particular kind of "social relationship between people, mediatized by images" – according to Guy Debord's definition of "spectacle."[48]

The singularity of cinema – in the wider category of reproductive arts – along with the importance of the spectacular component in its definition, are two of the most prominent features of Benjaminian thought. It was said above that the transformation of technique was simultaneous to a sociocultural mutation resulting in the massive democratization of art – or whatever may pass itself off as such. In fact, both characteristics are literally and singularly intertwined in the reproductive arts, and more particularly the latter's most achieved form: cinema. The implementation of reproduction is not a mere potentiality, but a process akin to contamination, so that, "to an ever-increasing degree, the work reproduced becomes the reproduction of a work designed for reproducibility."[49] A film reaches its destination in its quintessence: "In film, the technological reproducibility of the product is not an external condition of its mass dissemination, as it is, say, in literature or in painting. *The technological reproducibility of films is based directly on the technology of their production. This not only makes possible the mass*

dissemination of films in the most direct way, but actually enforces it."[50] Benjamin now seems to take the opposite view of Marc Bloch. Art for the masses is now seen, not only as an imposition on art, in the old sense of a new cultural condition – as, for instance, when reproducing a masterpiece painting and distributing it in an infinity of copies – but as intrinsically corresponding to its production technique. Cinema is the ultimate art produced for the masses, inasmuch as "*the technological reproducibility of the artwork changes the relation of the masses to art.*"[51] Nevertheless, if the latter idea seems to be leaning toward causalism, Benjamin also writes, a few pages later: "The masses are a matrix from which all customary behavior toward works of art is today emerging newborn."[52] In a chiasmus presenting a condensed version of such dialectics, he mentions "the alignment of reality with the masses and of the masses with reality."[53]

This is really the popular problem of the hen and the egg, which one cannot solve without incurring the two aforementioned dangers. This poses the question of the relationship of technology and culture – or society – which every innovation seems to initiate. In the video era, we imagined the disappearance of the collective cinematic spectacles – of movie theaters, that is – to the benefit of a family entertainment around the television set. Today, one may be tempted to adopt a similar line of argument with regard to the digitization of theaters, flat-panel displays, home theater systems and the interconnection between TVs and computers. As a way of warding off an all-too simplistic type of causalism, one may express reservations to such a disappearance, when considering the kind of sociality this art form represents, beyond the question of its technological aspects.[54] For similar reasons, we may criticize Benjamin's evaluation of cinema against art: drawing upon the idea that the new medium represents "the liquidation of the value of tradition in the cultural heritage," he calls on "the great historical films" and reminds us of a declaration that Abel Gance made in 1927: "Shakespeare, Rembrandt, Beethoven will make films..."[55] As a matter of fact, Gance meant quite the opposite: he presented himself as the inheritor of Great Art, in which film would come to replace literature, painting and music, and gradually take over.

This has nothing to do with bad faith. Benjamin leaves us facing a dilemma: because of its singularity, cinema – the most evolved and comprehensive form of reproductive technique – either falls outside the realm of art, or is destined to replace art. This reminds one of the hesitation characteristic of contemporary, postmodern thought, between the absorption of art by the cultural realm and its renewal thanks to the cultural realm. Then why should one persist in calling this "art," if the characters that enabled its definition are now considered as obsolete? Benjamin's answer – or rather, the answer formulated by Benjaminian thought – to this question certainly implies a renewed reflection on the interweaving of technological and sociological conditions. Benjamin's essay seems to oscillate

from one extremity to the other, each of which can alternately be seen as the starting point or point of arrival of Benjamin's reflection.

The Notion of "Découpage"

Generally speaking, "the age of technological reproducibility separated art from its basis in cult."[56] But what is this separation about? Is it the same for both photography and cinema? The difference between these two media clearly appears in a comparison which one might think of as off balance, since photography is not considered for its own sake but as the reproduction of a painting, and cinema is examined as a reproduction of reality:

> To photograph a painting is one kind of reproduction, but to photograph an action performed in a film studio is another. In the first case, that which is reproduced is a work of art, while in the act of producing it is not. The cameraman's performance with the lens no more creates an artwork than a conductor's baton; at most it creates an artistic performance. This is unlike the process in a film studio. Here, what is reproduced is not an artwork, and the act of reproducing it is no more such a work than in the first case. The work of art is produced only by means of montage. And each individual component of this montage is a reproduction of a process which neither is an artwork nor gives rise to one through photography.[57]

Leaving aside the disparate treatment of both means of expression, it is nevertheless interesting to focus on what Benjamin has to say about cinema – particularly regarding the question of vocabulary – where one may detect the influence of film editing theory, and notably of Soviet montage theory. Editing indeed is the main characteristic of cinema, and an indispensable condition for the latter to be considered an art form. However, in the French version of the essay, one may notice that the word editing – *montage* in French – was replaced by *découpage*, a notion specifically – not to say exclusively – pertaining to the vocabulary of French critics and technicians. It may either refer to the layout of a text – the screenplay – organized into divisions presenting the – sometimes numbered – descriptions of shots and scenes, or to the division of the film itself in fragments, pictures, shots and scenes. The division of the screenplay is a textual foreshadowing of the film, and the division of the film realizes the division of the screenplay in cinematic language. Of course, the subsequent shooting and editing of a film may come to contradict its textual anticipation, whereas a film without any preliminary screenplay still involves the notion of *découpage*. By substituting *découpage* for *montage*, Benjamin gives the reader a clear idea of what he means. Whereas *montage* is known as an operation resulting in the assembly of parts into a unified whole – whereby the fragmented film is mended (or so to

speak) – *découpage* reintroduces fragmentation: it designates a series of fragments in a state of co-presence which, according to Benjamin, leaves them just outside the realm of art.

Benjamin at once advocates the superiority of the whole over the parts and presents a criticism of elementary realism in a resolutely anti-Bazinian frame of mind: "[...] the vision of immediate reality [is] the Blue Flower in the land of technology."[58] Such rejection seems to result from Benjamin's vision of editing as an artistic principle: "The illusory nature of film is of the second degree; it is the result of editing." In this case, the English translators have chosen the English word "editing" instead of "montage," referred to as "*résultat du découpage*"[59] in the French version – a highly significant choice, since all the different versions present the same corresponding definition: "*In the film studio the apparatus has penetrated so deeply into reality that a pure view of that reality, free of the foreign body of equipment, is the result of a special procedure – namely the shooting by the specially adjusted photographic device and the assembly of that shot with others of the same kind.*"[60] And in the French version, the word "assembly" is translated as "*montage.*"[61] This enables the dissociation of the fragmented shots from their filmic recomposition, as well as the dissociation of the heterogeneous shots themselves from an assembly leading to a homogeneous result. One may thus consider that "the equipment-free aspect of reality has here become the height of artifice."[62]

From a technesthesic viewpoint – which at once characterizes the receiver's sensibility and the esthesic specificity of the technological device – the fragmentation caused by the *découpage* reacts on each individual fragment and interposes a specific sensitive filter between the actor and his recorded image. The film actor being involved in the mediation imposed by the reproductive device, "for the first time – and this is the effect of film – the human being is placed in a position where he must operate with his whole living person, while foregoing its aura."[63] To emphasize this observation, Benjamin compares the actor's situation in front of the camera to that of an athlete: a comparison pertaining to the general notion of expertise which, in Benjamin's thought, recurs to characterize both the reception and production of films: "It is inherent in the technology of film, as of sports, that everyone who witnesses these performances does so as a quasi-expert."[64] The actor, like the athlete, performs before "a group of specialists" – "executive producer, director, cinematographer, sound recordist, lighting designer, and so on."[65] Likewise, the selected shot is akin to an athlete's record, and the real event, when filmed, becomes a fictitious event which calls to mind "the competitive throwing of a discus in a sports arena." The analogy has its limit, nevertheless: the athlete measures up to nature, and the actor to a technological device – which also recalls the "mechanized tests" on an assembly line, or the tests run by the "agencies for testing professional aptitude." The latter comparison is developed in a note which does not appear in the second version of the essay:

> By broadening the field of all that may be submitted for testing, the role played by technological devices in the presentation of films is analogous to the role played, for an individual, by those economic circumstances which, as a whole, gave way to an extraordinary increase of the contexts where he is liable to be tested. Professional aptitude tests, for instance, seem to be growing in importance. The latter consist in a number of *découpages* operated on an individual's performances. Both film shootings and professional aptitude tests take place before a learned assembly of technicians, and the film editor in his studio is in the exact same situation as the controller running a professional aptitude test.[66]

One may once again notice – and even admire – the mediations which the author uses to clarify and explain his meaning. By doing so, Benjamin enables one to understand that a precise examination of technological mediation, by transcending the mere question of analogy, may lead to the social substrate itself. Cinema, sports and tests are not only contemporary phenomena – in our time, with its ever-growing emphasis on mediatized sports and notation systems targeting people (university professors included) as well as nations – they all belong to the same sociocultural and historical context.

Aestheticization[67]

Benjamin raises three questions in the field of art theory. The first one concerns the aesthetic issue – that of values – with regard to the notion of aura, the power of which reaches a peak in hieratic art forms, and declines through the process of reproduction: "These changed circumstances may leave the artwork's other properties untouched, but they certainly devalue the here and now of the artwork."[68] The second question involves semiotic and aesthetic issues that prolong and renew their theoretical legacy. According to Benjamin, "in even the most perfect reproduction, *one* thing is lacking: the here and now of the work of art – its unique existence in a particular place."[69] This statement may be interpreted two ways: the beginning of the sentence lays emphasis on the deficiency of the reproduced image with regard to reality – an idea long defended by the theory of imitation about the image itself. The rest of the sentence deals with the loss of value, the loss of the aura – the halo that, according to Benjamin, surrounds a work of art proportionately to its unicity and originality: a concept that turns the mere observation of an image's semiotic deficiency into a value judgment of an aesthetic order. The third question concerns sociology and history – since reproduction involves "the liquidation, of the value of tradition in the cultural heritage"[70] – and the correlative issue of the advent of art for the masses seen as a double reversal: the paradoxical promotion of art for the masses in the cultural sphere, and in the political sphere, the question of aestheticization – a topic that

deserves more than a few words at the end of an article. In Benjamin's text, it appears almost furtively, at the end of the essay, in what is probably one of its most fragile yet enlightening passages.

To aestheticize means aestheticizing something unaesthetic, a phrase that leads one back to Aristotle and instantly brings to mind the notion of embellishment found in his *Poetics* (chapter 4): although we may be disgusted by the sight of some repulsive animals, we may also find pleasure in their representation, whereby they are embellished. Benjamin, as we have seen, extends the principle to "the artistic gratification of a sense of perception altered by technology,"[71] regarding, in this case, the glorification of war by Fascism and Marinetti, the Futurist painter. As an example of aestheticization, Benjamin quotes from a manifesto where the latter claims that "war is beautiful."[72] Consequently, war is to a repulsive animal what a poem about war is to an etching representing a spider or a snake. However, the purposes of embellishment and aestheticization are different. According to Aristotle, the purpose of embellishment is cognitive: insofar as the vector of representation enables us to contemplate an otherwise unbearable sight, it also permits us to analyze the latter, go beyond its appearance and have access to its form – the key to knowing a thing. Benjamin moves on from the question of cognitive gain to the political field, and his development on artistic and sport expertise could give us more food for thought on the topic. At the end of the essay, the notion of aestheticization rather refers to the alienation of the masses by a totalitarian strategy: it is associated to war, violence, politics and extended to art through the example of Marinetti. However, if the latter adheres to Fascism, and if his manifestos – notably "the manifesto for the colonial war in Ethiopia"[73] – may be read as pamphlets promoting this kind of ideology, Futurism, as a formalist avant-garde, does not meet the criteria of aestheticization.

By the end of his essay, Benjamin has shown that, in the context of art forms that are either generated by reproduction or suffer from the latter, the work's aura regresses as elite art is progressively being replaced by art for the masses. Futurism, as a matter of fact, belonged to elite art, and its repeated attacks against artistic institutions pertained to specific strategies inside the realm of art. Even though certain Futurist artists adhered to Fascist ideology, their cultural effectiveness as artists only incidentally intersected the totalitarian strategies aimed at alienating the masses. On the contrary, it was mostly in the sphere of art for the masses – and especially cinema – that such strategies were carried out, as well as in cultural and sporting events. One of the particularities of those alienation strategies again implied representation, as great popular events – sporting and otherwise – worked as a mirror offering the masses an embellished image of themselves, an aestheticized image provided by Fascism: "*Mass reproduction is especially favored by the reproduction of the masses*. In great ceremonial processions, giant rallies and mass sporting events, the masses come face to face with themselves."[74]

The antidote to the aestheticization of politics and violence is supposed to be found in the politicization of art.[75] In fact, reproductive technology implies the replacement of the individual relationship to an artwork – required by painting, for instance – by an attitude of collective reception in conditions of reproducibility that modify the attitude of the masses themselves: "*the extremely backward attitude toward a Picasso painting changes into a highly progressive reaction to a Chaplin film*," and "the same public which reacts progressively to a slapstick comedy inevitably displays a backward attitude toward Surrealism."[76] Whereas Benjamin relates Futurism to contemporary Fascist ideology, he assimilates Cubism and Surrealism to an elitism of the past. And the now progressive masses are nevertheless the same masses hypnotized by the Fascist mirror of their alienation. In that respect, it is obvious that the contextual use of certain examples express strategic choices. For instance, one could mention Chaplin's MODERN TIMES – shot in 1935, the year Benjamin wrote his essay – and its criticism of mechanic modernism. Regarding Picasso, one could mention *Guernica* – as an emblem of the politicization of art – about which the artist declared: "The Spanish Civil War is a war waged by the reaction against the people, against freedom. My whole life as an artist has been nothing else than a perpetual fight against the reaction and the death of art. In the painting I am working on – which I will entitle 'Guernica' – and in all my recent pieces, I clearly express the horror I feel toward the military caste that has sunk Spain into an ocean of suffering and death."[77]

Aestheticization nevertheless remains an enlightening notion, inasmuch as it highlights the dark aspects of technology and politics, as well as their collusions, for better or for worse. More particularly, the "Blue Flower" of the realistic ideology of reproduction may be found in an idyllic vision of art for the masses which, while apparently realizing a democratic ideal by depriving the bourgeoisie of its position of social domination – autonomous art being one of the aspects of this position – may also serve as an instrument of mass alienation, all the more so as the masses are being gratified with an embellished image of themselves – a process virulently criticized by a certain elite art, including a certain type of cinema. Today, the aestheticization of violence appears in the bloody fight scenes of the movie blockbusters the masses eagerly consume. It appears in the themes and fictions of such films, but also in their forms and pyrotechnic explosions, which so marvelously exemplify the power of technology.

Conclusion

Certain films leave us with a strange feeling: we may have experienced some discomfort – maybe even disgust – while watching them, but in the end we keep a globally positive impression. In such cases, the film has managed to seep into us, to impose itself upon us, and the repulsion we may have felt has finally receded. This is the kind of impression Benjamin's text leaves me with: in spite of certain

passages I occasionally disagree with, I globally appreciate it. I even think it is one of the most important texts written in the field of aesthetics. My ambivalent feeling is probably due to the palimpsestic dimension I mentioned in the beginning of this article, and the many pitfalls we must learn to circumvent in order to appreciate an exceptional thought elaborated in a brilliant and close interlacing of technological-aesthetic and sociopolitical themes which, in the light of Benjamin's modernity, will help us understand our own.

Aestheticization is a highly fragile and stimulating theme, for those who use the Benjaminian matrix to reconsider the present-day situation. Aestheticization may also be found in the realm of contemporary art, where art in the old sense of the word – the auratic sense – has been regressing to the benefit of all kinds of products more or less thrown together in a spirit of ready-made or kitsch, and generally exhibited as if they were artworks but without being officially presented as such – as someone who denies being good-looking but likes to hear other people call him/her so... In the meantime, the art of film has accumulated a number of works in the old sense of the word. The heirs of Picasso present non-works in contexts that still confer upon them a certain aura of artistic distinction. On the other hand, the heirs of Chaplin present "old-fashioned" art forms, closed entities all dedicated to the expression of a single artist – works in the sense of Picasso's paintings and the films of Charles Chaplin. The art of film sometimes resists the spectacular condition that tends to dilute it into mass culture, to which it nevertheless continues to belong.

Translated by Maxime Shelledy

Toward an Archaeology of the Cinema/ Technology Relation: From Mechanization to "Digital Cinema"[1]

Benoît Turquety

"The Last Machine?": The Digital Age and the 1930s

Considering the historiography of the cinema from the outside – that is, re-establishing it within the context of the social sciences of the time – strange coincidences emerge.

As is well known, the history of the cinematic medium has established itself from the very beginning as a technological history. The reasons for this fact are numerous and complex: from patents and their economic – or patriotic – implications, to the pedagogy of the mechanisms of the illusion to the curious. In any case, all the historical essays on moving pictures published between 1895 and around 1925 conceive their task as the description of the evolution of the machines, and the historical-ideological determination of the important innovations. The history of the medium began to be conceived differently when it began to be perceived as an art form, a transformation that can already be sensed in Terry Ramsaye's book of 1926, and is completed in Paul Rotha's 1930 volume and Bardèche and Brasillach's 1935 history of film.[2]

But in fact, during that time, the history of technology as a discipline was not yet founded. Its project was constructed precisely during these early 1930s. So there seems to be an odd historical delay or missed beat between the evolutions of the history of cinema and of the history of technology, the first being technologically oriented before the second emerged, and then turning away from the machines. A strange coincidence.

Actually, the 1930s emerges as a crucial moment regarding the general presence of technology in culture. It was a time when technology entered the sciences as a major theme, in nearly all disciplines. So how come historians of cinema lost interest in technology precisely at the moment when technology caught the attention of other historians, philosophers, scientists, etc.?

These coincidences raise a number of questions, and particularly that of the existence and nature of a link, in the 1920s and 1930s culture and sciences, be-

tween cinema and technology. If cinema is perceived as a technological art, it may also be that at the time, technology itself was perceived within a conceptual sphere centered on the cinema. The cinema would have acted as a cultural model to represent technology in a wider sense, embodying some of its most characteristic features: mechanical, modern, involving speed and vision, the cinema would be "the last machine." This, after all, may be the reason why the transition from analog photochemical inscription to digital encoding suddenly makes the medium unsure of its own identity: if it is still a "technological art," it may well be that what we mean now by *technology* is not what was meant by the term when cinema was institutionalized. And it may well be that our contemporary concept of *technology* has shifted to another conceptual sphere, where the cinema's place is not central – if it exists at all. At the time of mechanization, *technique* and *technology* were cinematic notions; in the digital era, the link between the *cinema* and those concepts has changed, because the paradigms have changed around them, perhaps the *episteme* itself.

I would like to approach this problem by proposing an exploration of the modalities of the penetration of technological issues in the scientific field of the time, especially in France and Germany, with a particular attention to the place and function that cinema may have had in this penetration.

The French in the 1930s show – like people in other countries – an obsession for technology. Its most obvious form is the recurrence of debates on mechanization. Ironically, the constant repetition of the theme in the writings of the time is reproved in each of the texts that participate to the phenomenon. The problem of the machine is of course not new. It could be traced back at least to the Renaissance, in the filiation of the medieval "mechanical arts," to then grow through many historical variations, as can be observed in the works of Filippo Brunelleschi or Leonardo da Vinci, in the numerous and massive "machine theaters" of the 16th and 17th centuries, the exhibitions of models of machines from the 17th century onwards, the theories of La Mettrie or Descartes on the "man-machine," Vaucanson and Jaquet-Droz's automatons, the *Encyclopédie ou Dictionnaire raisonné des Sciences, des Arts et des Métiers*, etc.

This question of the machine became of particular, structural importance for the 19th century, on several levels. During the first years of the century, a new branch of knowledge was formulated, notably with the first lessons given at the French École Polytechnique by Gaspard Monge: kinematics. The purpose of this science is the systematic study of machines, and especially the classification of their basic elements: mechanisms. It kept developing through the century mainly within the framework of engineering schools, producing several important works with Charles Laboulaye or Franz Reuleaux. In the opening of his 1885 course of "Pure Kinematics" at the Faculté des sciences in Paris, Henri Poincaré gave the following, beautiful definition: "Kinematics is the study of movements regardless of the causes that produce them, or to be more exact, it is the study of

all possible movements."[3] But this science, aiming first at the education of a technological elite, deals above all with description and classification, sometimes analysis: the historical dimension, as well as the construction of a coherent theoretical framework, are out of its scope.

Besides, the second half of the 19th century is the time when the motif of the machine penetrated deeper and deeper into the literary and artistic field, from the novels of Emile Zola, Jules Verne or Villiers de l'Isle-Adam, to the avant-gardes of the first decades of the 20th century.

This progressive cultural impregnation seemed to end up, during these 1930s, in a form of explosion of the question affecting all the areas of culture – as well as politics. This certainly had to do with the expansion of Taylorism in the organization of work within the industry, as well as with the proliferation of machines in everyday living, which gave a new dimension to the theme. Is the machine liberating, a source of well-being and an embodiment of progress? Or is it enslaving, imposing its rhythms to the worker and its obtuse materiality to the thinker? Chaplin's 1936 Modern Times is only the tip of a huge iceberg of productions of all natures – including films, with the works of Eisenstein (Staroye i Novoye, 1929), Vertov (Chelovek s Kinoapparatom, 1929), but also Ralph Steiner (Mechanical Principle, 1930), Eugène Deslaw (La Marche des machines, 1927), Joris Ivens (Philips Radio/Symphonie industrielle, 1931), etc. A condensation of the questions involved could be found in the concluding chapter of Bergson's 1932 *Two Sources of Morality and Religion*, bearing on the relation between "Mechanics and Mysticism,"[4] or in the title of Lewis Mumford's *Technics and Civilization* (1934) – that "and" being in fact more threatening than one could think...

Machine, Technique, Technology

Before proceeding, two rather important distinctions have to be made, in order to specify cultural differences and intellectual traditions. The first is between *machine* and *technique*, and the second between *technique* and *technology*. In the various linguistic areas concerned by those questions, the dominant vocabulary is not always the same. For instance, if the *machine* can be considered as an obviously central object in the French cultural field of the time, this does not apply to *technique*. This last notion seems then barely constituted as such, hardly visible. It is during this 1930s decade that it will undergo a rapid expansion.

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 *technol-*

> *ogy* was a branch of learning, or discourse, or treatise concerned with the mechanic arts. [...] [T]he word then referred to a field of study, not an object of study.[5]

Marx then goes 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."[6] In an earlier essay, Eric Schatzberg describes "the current characterization of *technology* as the methods and material equipment of the practical arts," a meaning whose domination in the English language goes for him back to the 1930s, following the works of Thorstein Veblen.[7] In the field of film theory however – or of the theory of cinema history – Rick Altman has complained about another confusion. According to him, *technique* designates and should only designate ways of doing, whereas *technology* deals with the machinery, and should be strictly restricted to this area. That, for him, is a crucial distinction, as:

> 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.[8]

But if technical objects and technical practices do have specific differences in their evolutions, the philosophy of technique has shown, from André Leroi-Gourhan to Gilbert Simondon, that their studies cannot be separated, for reasons that Altman himself partly suggests ("technology often automatizes an accepted technique"[9]). In fact, the history and theory of techniques have, at least in the French-speaking area, built themselves on that principle: *techniques* are both the machines and the ways those machines are used. And if the restriction of *technology* to the *logos* about techniques sounds now obsolete in English – as well as in common French uses, I must say – it has remained effective and fully pertinent for the French-speaking scientific tradition. In this perspective, *technology* designates the discourses about techniques, whether scientific or prescriptive, discourses which can be studied as a cultural object in themselves. This article here dealing mostly with the French tradition, I will stick to this terminology – but readers should keep in mind that devices *are* techniques.

(Cinema and) the Emergence of the History of Techniques

The foundation of the history of techniques as a discipline was provoked in France by objects that sound a bit far from the mechanization problem at first, but can in fact not entirely be separated from it. In the June 1926 issue of the *Revue de synthèse historique* a review by Marc Bloch was published of an essay by Major Lefebvre des Noëttes, "La Force motrice animale à travers les âges" [Ani-

mal Traction through the Ages]. The book by this "former cavalry officer who had the fine idea of contributing his professional skills to historical studies"[10] discussed the history of the horse harness, showing "the flaws of the antique harness" and emphasizing the elaboration of new techniques during the 11th century. The theme could evoke a somewhat austere book, were it not for the author's daring hypothesis, thus summarized by Bloch:

> Strictly limited in their use of animal motive force through traction [by the flaws of their harnessing systems], the antique civilizations have had to resort to a very extensive use of human motive force, that is to say of slave labor. [...] Reciprocally, western Europe has been spared the return of such atrocities thanks to the great inventions of the eleventh century.[11]

Entitled "Techniques et évolution sociale. De l'histoire de l'attelage, et de celle de l'esclavage" [Techniques and Social Evolution: About the History of the Harness, and That of Slavery], Bloch's review elaborated straightaway a certain number of the crucial problems of the historiography of techniques, which the book raises. Or, Bloch wrote:

> Perhaps would it be more exact to say that it raises only one, but very important [problem]: it leads us to wonder how technical development is related to economic evolution and to the transformations of social organization.[12]

Apart from specific methodological questions, the central problem of the history of techniques appears then as the problem of technological determinism, consisting in attributing, in a simple and unambiguous manner, cultural and political (or aesthetic) transformations to technical innovations. Mankind freed from slavery by harnessing techniques or enslaved again by the machinations of the industry is, centuries apart, twice the same problem. Technological determinism remained a central interrogation in film historiography, this time on the aesthetic level.

Those questions led Bloch and Lucien Febvre in 1935 to the realization of the first thematic issue of the *Annales d'histoire économique et sociale*, the journal they had founded in 1929. The issue dealt precisely with technology, titled "Techniques, History and Life." The issue was introduced by a programmatic and groundbreaking text by Lucien Febvre, "Reflections on the History of Techniques." It began with these sentences:

> Technique: one of those many words whose history hasn't been written. History of techniques: one of those many disciplines which must still be entirely created – or almost.[13]

The volume as a whole leaves the reader with the strong feeling of the conscious opening of an entirely new field, with the obvious enthusiasm that it can arouse, as well as the pressing need to set its methodological and theoretical framework.

In parallel, Marc Bloch published in 1931 the book *Les Caractères originaux de l'histoire rurale française*, translated by Janet Sondheimer in 1966 as *French Rural History: An Essay on Its Basic Characteristics*.[14] He specified in the introduction the principles of the "regressive method" that he proposed to apply to the landscapes of the French countryside, in order to be able to grasp "life itself, which is nothing but movement." The introduction closed on an analogy:

> To the recent past, the regressive method, used with measure, does not ask for a photography which would then merely need to be projected, always remaining the same, to get the frozen image of ages more and more remote; what it aims at grasping is the last reel of a film which it tries to unroll backwards, resigned to discover more than one gap, but resolved to respect its mobility.[15]

The cinema, then, does not appear in Bloch's work as a possible object of history, but as a model for historical work. The cinematic machinery combines in the most striking way several abilities of interest to the historian: it can go back in time; it can preserve the essential movement and instability of its object; and it can work in spite of gaps, not inventing false continuities to make up for its flaws, but taking advantage on the contrary of its fundamental discontinuity. One feels strangely close here to Walter Benjamin's theses "on the concept of history." History in itself should become cinematic: an epistemological transformation is at stake, which is exactly contemporary with the birth of techniques as a historical object.

But history is not the only discipline then affected by the emergence of an awareness of technical issues. Closely related disciplines, such as archaeology, undergo a similar movement. In 1936 André Leroi-Gourhan published one of his first important texts, "Man and Nature: An Essay in Compared Technology," in the seventh volume of the *Encyclopédie française permanente*, edited by Lucien Febvre. "Compared Technology" is conceptualized as a new method, the study of tools and ways of doing in different cultures. This turn in ethnology is then fully in touch with the most contemporary artistic problems, as appears through journals like *Documents*, edited by Georges Bataille in 1929-1930, and *Minotaure* between 1933 and 1939, where ethnographically oriented texts and photographs by Michel Leiris, Marcel Griaule and others were regularly printed.

"Techniques of the Body": Sociology, Psychology and the Cinema

In another area of social sciences, Marcel Mauss – of whom Leroi-Gourhan had been a student – presented in 1934 to the French Society of Psychology a paper entitled "Techniques of the Body," which was published two years later in the *Journal de psychologie*.[16] He explored the idea that our bodily and gestural habits, our ways of walking, swimming, sleeping, are not chiefly natural or personal, but chiefly collective: they "form a social idiosyncrasy – they are not simply a product of some purely individual, almost completely psychic, arrangements and mechanisms."[17] They are transmitted and learned, "the facts of *education* are dominant":[18] "In them, we should see [...] techniques."[19] This leads Mauss to redefine technique, and differentiate the notion from the objects to which it is too commonly reduced: "I made, and went on making for several years, the fundamental mistake of thinking that there is technique only when there is an instrument."[20] Mauss then proposes a definition: "I call 'technique' an action that is *effective* and *traditional*";[21] it is "a series of assembled actions [*actes montés*], and assembled [*montés*] for the individual not by himself alone but by all his education, by the whole society to which he belongs, in the place he occupies."[22] The term "*montés*" echoes with "the notion we have of the activity of the consciousness as being, above all, a system of symbolic assemblages [*montages*]."[23] The choice of the term *montage* for the technical cinematic operation of cutting and splicing – which is evoked here by the "series of assembled [*montés*] actions" – appears through Mauss's text as a moment of a wider circulation of the notion, linked with this context of reflection on mechanization.

The cinema does explicitly appear within this paper, as one of the means of this collective transmission that characterizes gestures as techniques:

> A kind of revelation came to me in the hospital. I was ill in New York. I wondered where I had seen girls walking the way my nurses walked. I had the time to think about it. At last I realized that it was in movies. Returning to France I realized how common this gait was, especially in Paris; the girls were French and they too were walking in this way. In fact, American walking fashions had begun to arrive over here, thanks to the movies.[24]

I would love to comment extensively on this anecdote, which intertwines the motifs of the cinema, America, the gaze, the walk and the girl in a particularly rejoicing way, but that might lead us away from our subject. Let us only note that the cinema here is not a technical object – a machinery that can be used for instance for a chronophotographic analysis of the human walk – but a mass media and a vector of transmission. It produces cultural transformations by diffusing social models, in particular those "body techniques," collective gestural constructions unconsciously disciplining our bodies.

The Engineer and the Media: "Mechanology"

So it appears that in some cases, the transformations occurring in various scientific fields in relation with technical matters can be linked with a certain presence of the cinema in the intellectual culture of the time, either as a technical apparatus, or as means of massive diffusion of images. The question of technique materializes then on several levels, but it never entirely vanishes. In fact, these elements can be perceived beyond social sciences. A renewal of the conceptions of the machine is already taking place among engineers. An interesting example of such a change, *Réflexions sur la science des machines*, has been published in 1932 by the engineer Jacques Lafitte, whom Gilbert Simondon later recognized as an anticipator of sorts of his own work. Lafitte also proposed the foundation of a new discipline, the third such foundation in the few years studied in this article after Febvre's history of techniques and Leroi-Gourhan's compared technology: "mechanology." Lafitte renewed the principles of kinematics from within the discipline's tradition. He didn't classify mechanisms according to the movement transformations that they operate anymore, but according to the complexity of their relations to their environment. At the simplest level of this relation, Lafitte considered architectural constructions as machines, which singularly alters the way that the problem of "mechanization" can be seen.

But in the context of this essay, our attention is particularly drawn by Lafitte's short introduction to his book. These austere considerations of a technician impassioned by his objects, but who also appreciates Samuel Butler, H.G. Wells and Edgar Allan Poe, are presented to the reader through a double sort of mediation, by a piquing little scene. Here are the first sentences of the book:

> I own a phonograph and I have the rarer and charmingly provincial pleasure of having a philosopher as a friend. He is wise, though sometimes taken away by his disposition. He then becomes of sudden judgment.
>
> We had played a few records and I was preparing the machine again when he exploded:
>
> "No – he said – no, and again no. I definitely cannot bear that sort of music which is now distributed to us. And I think that you are, you and your kind, outstanding criminals. You cannot but invent and take us, each day more, in the network of the artifice. With your science, your progress, your machines, you go destroying, a little more each day, what is left of simplicity in the world. You smother in us the primal and divine spark, and because of you, each day, we are a little less free. Submitted to the machine, we suffer the narrow subjection to the products of our own creation."[25]

The crank thus suspended by philosophic furor, the narrator must leave there his records and engage in a plea for a better understanding of machines, which leads

him to let his friend and the reader know his reflections on a mechanological science. But "canned music" is not by chance the opener of the book: an important part of the debates of the time about mechanization does not bear on its directly political dimension – the way it affects the body of the worker – but on the danger of its cultural implications – a more metaphoric or symbolic enslaving, that concerns the mind and cultivated classes. When Élie Faure publishes in 1933 his "Défense et illustration de la machine" in the *Mercure de France*, he insists on that point: the opposition to mechanization is above all "the revolt of a whole class against the machine – for it's the ruling class who, after having created the machine, repudiates the incipient monster about to devour it."[26] The machine is for those opponents the sign of a new culture, where the artist is killed by the engineer, and the craftsman replaced by the worker. To this condemnation of the machine, "all take part," writes Faure, "sociologists and philosophers, poets and novelists, playwrights, and even filmmakers, God forgive me."[27]

The cinema and the phonograph – to which the radio must be added – are thus the major instruments of this destruction of culture by the machine, a destruction of the mind itself, *l'esprit*, to quote the term then mostly used.

Epistemology, Technique and the Aesthetics of Mechanized Reproduction

Physics and epistemology are also concerned by the double problem of the machine and of the technique – and there again, cinema finds itself playing a significant role. Gaston Bachelard's first doctoral thesis, "Essai sur la connaissance approchée" [Essay on Approximate Knowledge], defended in 1927, includes a chapter entitled "Knowledge and Technique: Approximate Realization." Bachelard questions science and technique's relations to the real and to rationality, to individuality and to generality, to accuracy and to approximation, to precision and to looseness. The manufactured, industrial object appears central to the text, defined by its characteristic properties of usefulness and convenience, its balance between "level of finish" and cost price, its "perfect generality."[28] The study of this object is the concern of kinematics, "a formal science of undeniable purity,"[29] writes Bachelard. In the essay, this industrial object is immediately linked with movement, and with its pure aesthetic enjoyment. According to Bachelard, "manufactured objects" possess,

> [A] schematic grace [...] of the same order as the Bergsonian grace that finds, following curvy lines and avoiding angles, a feeling of ease within perception, the easy anticipation of a movement, "the pleasure of arresting as it were the march of time and of holding the future within the present."[30]

The object contains "the aesthetic history of the fabrication," and founds an "occasional aesthetics," an aesthetics of "sharpness," of "clarity," which essentially lies in the rejection of detail and ornamentation in favor of the pure line. This new aesthetics, reminding one of Adolf Loos, seemed paradoxical to Bachelard in that it is based on a fundamental *lack* of individualization. Linked to mass production, it directly involves reproducibility:

> The object is not reluctant at being copied because the idea is not dispersed in the various samples, but remains manifest and entire in each with its harmony and its elegance.[31]

The technological beauty is the beauty of the idea. Some pages later, Bachelard wrote that, the freedom allowed to the technician by the latitude of the mechanical looseness being a false freedom, "in the end the engineer is not an artist choosing and signing a work full of personality, he's a geometer."[32] This may appear as a contradiction, the engineer being deprived of an artistic value that Bachelard seemed ready to grant to the industrial object. The explanation for this contradiction may lie in a certain disjunction between aesthetic experience and conception of art, a disjunction for which the emergence of technology in fields related – culturally or conceptually – to art holds some responsibility. Bachelard's obvious sensitivity to the aesthetic qualities of the industrial object isn't that common at the time: one of the frequent criticisms made of mechanization, that can be found in Bergson for instance, is the anxiety of standardization, everyone wearing the same hat.[33] In the debates of the period, the disruptions involved by technical reproducibility are not considered only in the case of the work of art, but affect all things – and perhaps beings.

In 1931, Bachelard reintroduced technique in his work. In his essay "Noumène et microphysique" "appeared for the first time it seems the notion of 'phenomenotechnique' which will become, from 1934 onwards, a fundamental category in Bachelard's epistemology,"[34] as Georges Canguilhem wrote. For it is unthinkable, according to Bachelard, to trust an immediate given of which science could do a simple "phenomenography": it must on the contrary be opposed "a phenomenotechnique by which phenomena are not found, but invented, but constructed from scratch."[35] This idea led Bachelard to confer a critical place to instruments, apparatuses and experimental procedures, considering them as crystals of theory and of history.

Besides, Bachelard composed in 1933 an article on problems involving daydreaming and visual perception: "Le monde comme caprice et miniature" [The World as Whim and Miniature]. The photographic apparatus was invoked as a model for the description of the eye, rather traditionally even if Bachelard transformed the classical implications. He also described "the advantage of the experi-

ence with consecutive images," a perception protocol which allows to "decompose in time the excitation-sensation complex."[36]

At the same time, in 1932, Abel Rey, Bachelard's dissertation supervisor, founded in the Sorbonne the important Institute for the History of Sciences and Techniques, that would remain crucial for the history of the French tradition of epistemology and for the historiography of techniques. After Rey, Bachelard became the president of the institution in 1940, then Canguilhem in 1955.

The question of technique was also central for this other founding figure of 20th-century French thought, who was a major influence on Michel Foucault. Canguilhem's first two scientific papers were explicitly discussing this theme: "Descartes and Technique," his contribution to the important 1937 Descartes conference, and "Technical Activity and Creation" in 1938. Those two lectures promoted the "creative originality of technique,"[37] implying that we should consider technique within "a theory of creation, i.e., basically an aesthetics."[38]

"Technical Thought": A Cinematic Conceptual Framework

Technique reappeared again in the philosophy of science in those early 1930s along an almost opposite perspective. The work of Julien Pacotte, *La Pensée technique* [Technical Thought], published in 1931,[39] was largely informed by quantum mechanics, but – as opposed to Bachelard's positions – the book aimed at advocating pragmatism, and the focusing on technique appears as a means to "preserve physics from losing itself in the realm of abstraction by keeping it close to its object: the world of perception and action."[40] Pacotte argued that physics should be considered as a "general technique," this science being essentially experimental, and as a consequence technical since according to Pacotte "the two notions 'experimental' and 'technical' can hardly be differentiated other than by the theoretical purpose of the former."[41]

But the heart of Pacotte's work lay in another suggestion. It was centered on "a fundamental technical concept" that he drew from "the many and diverse technical operations of which it is the principle": that of "*technical transformation*." From this newly defined concept, he presented "the idea of a general science of transformation":

> The definition is abstract by its very generality; but its practical importance is emphasized by the great number of techniques whose purpose corresponds precisely to the concept thus defined: let's mention, among others, kinematic measures, intensive measures, recording, optical magnifying, photography, the cinematograph, the phonograph, the telegraph, the telephone, phototelegraphy, television.[42]

These apparatuses resurfaced many times throughout the book, along with several others: optical phonography, the lantern, slow and fast motion cinematography, the telegraphic strip, engraving, the chronograph, etc. These machineries taken as a whole constituted the epistemological model for Pacotte's conception of technique and, as a consequence, of science, as can be seen through the network of key notions on which the entire work is based: reproduction, optical mediation, transmission, recording, trace, inscription, etc. "Technical thought" was thus thoroughly shaped within a post-Mareysian or cinematic conceptual framework. It is because the privileged objects defining technique itself were for him those visual and sound apparatuses, that he can conceive the whole of technique as transformation. Pacotte's book is largely forgotten today, in spite of being mentioned several times by Canguilhem in "Machine et Organisme" (1946); but it strikingly reveals how the conception of technique of the early 1930s – or, to adopt the dominant terminology of today, of technology – has been radically reoriented by visual and sound technical apparatuses.

The second half of the 1930s was marked, as for technological matters, by some sort of acme: the International Exhibition held in Paris in 1937, entitled "Les Arts et les techniques dans la vie moderne." The cinema was central in the event, due to the Photo-Ciné-Phono pavilion but also to the use of the apparatus in almost all of the sections.[43] This exhibition was a sign of the continued presence of these questions in the field of art since the first avant-gardes, and of their diffusion in all areas of life. Its organization had several repercussions, as for instance the setting up in 1936 in the Conservatoire national des arts et métiers – one of the most important places for technical learning in France – of a course in electroacoustics, television and cinema called "Telephonovision."[44]

The event was prolonged from May to August 1938 by the publication of four successive special issues of the important journal *Europe* under the general title "L'homme, la technique et la nature" [Man, Technique and Nature]. The first issue was opened by Georges Friedmann, the last was closed by Lucien Febvre; contributors included Marc Bloch, Le Corbusier, Fernand Léger, Léon Moussinac (with an article on "Theatrical Technique"), Pierre Abraham, Darius Milhaud, André Spire and, H.G. Wells, among many others. Strangely, the cinema was totally absent from these issues, appearing only in a series of short critics by Léon Werth, situated outside of the thematic collection.

Between France and Germany: Benjamin and Around

This study should be completed by an analysis of what happened during the same period in other countries, for instance in Germany. The German specific intellectual tradition also gave to the technological questions an important development at the time, but on a quite different basis. The contribution of the Bauhaus, whose motto from 1923 onwards was "Kunst und Technik – eine neue

Einheit" [Art and Technique – A New Unity] certainly plays a significant role. On a parallel level, the theme finds many echoes within philosophy and art history. The very beginning of the 1930s saw the publication of two key essays, very different in content and approach, but whose influence would remain crucial for later developments. One was Oswald Spengler's book *Der Mensch und die Technik. Beitrag zu einer Philosophie des Lebens* (1931),[45] and the other was Ernst Cassirer's article "Form und Technik" (translated in English as "Form and Technology"[46]). In the latter, technique was defined as "the form of an acting," thus belonging to Cassirer's category of "symbolic form." It is important for us to recall that the essay was published in the 1930 book *Kunst und Technik*, edited by Leo Kestenberg,[47] whose sections examine successively "Music and Technique," "Word and Technique," "The Radio," "The Film," "The Sound Film," and "The Record." This division and the cultural landscape it defines regarding the problem of "Art and Technique" in 1930 are of course rich of implications for our subject. The very fact that film and sound film should be, in this context, considered in two different sections is already significant. The filmmaker Walter Ruttmann contributed to the first section a text entitled "Technik und Film."

These problems found a singularly complex development in Erwin Panofsky's work. The 1927 seminal essay "Die Perspektive als symbolische Form" was in fact actually a historical epistemology of a painting technique, even though the term "technique" did only rarely appear. But for Panofsky, that "quite specific, indeed specifically modern, sense of space or if you will, sense of the world" was justified and constructed by constant reference to the photographic technique – or, to adopt again the dominant vocabulary of *our* time, technology – the "habituation [...] to linear perspectival construction" being today "further reinforced by looking at photographs."[48] The distinctively cinematic problems did not appear in the text, except through the evocation of the "imaginary space" produced according to El Lissitzky "by mechanically motivated bodies, by this very movement."[49] That hypothesis did not sound very convincing to the art historian. But questions of a close nature returned throughout his work, whether in "Original und Faksimilereproduktion," published in 1930,[50] or of course in the text "On the Movies," whose first version came up as a lecture in 1936.[51]

Today, all those complex, heterogeneous and proliferating interrogations are often considered through the sole contribution of Walter Benjamin, "Das Kunstwerk im Zeitalter seiner technischen Reproduzierbarkeit." Composed in several versions between 1935 and 1938, the essay was published at the time only in the French version resulting from a collaboration between Benjamin and Pierre Klossowski, under the title "L'Œuvre d'art à l'époque de sa reproduction mécanisée" [The Work of Art in the Age of Its Mechanized Reproduction].[52] This French title sounds of course closer to the English translation generally adopted [The Work of Art in the Age of Mechanical Reproduction], in that it transposes the semantic field of the *technical* into that of the *mechanical*, a move whose importance can only

be perceived when considered within its original framework of conception and diffusion: the 1930s debates on technique/technology (and film). In fact, all the text would benefit from a rereading in the light of the discursive production of the time. This archaeological reconsideration of the "Work of Art" essay – to which this article here partly aims at initiating – seems necessary in order to perceive what actually constitutes the most crucial points of Benjamin's contribution.

For an Epistemology of "Digital Cinema"

The 1930s are the years of the emergence and construction of technique/technology as an object in all the branches of knowledge, provoking a complex – and sometimes rather strange – circulation of themes, motifs, interrogations and worries. Beyond the problem of "mechanization," technique appears as fundamentally collective, essentially general, non-individualized and thus constituting a threat to the individual – a problem to which Gilbert Simondon would later return, from a different perspective. By its essence and its products, it implies an aesthetics, but a singular one.

The cinema seems to play a major role in the cultural construction of the very essence of the technical. But in return, the concepts that the cinema uses for its own definition, even on an aesthetic level – *montage*, for instance – are themselves emanations of this wide circulation of discourses on technique and the machine. A certain number of questions traditionally related with the cinema, as for example the aesthetic implications of technical/mechanical reproducibility, have to be replaced in the wider scientific and cultural context of technology, considered as a specific epistemological domain, as it is in this domain that they are first constructed. In this field, the cinema appears at the heart of a network which goes beyond a strict "intermediality" to include visual and sound apparatuses not dedicated to entertainment or art, but also machines in a wider sense, industrial mass-produced objects, and perhaps even ready-to-wear clothes...

The 1930s show the elaboration of a fundamental, complex, multi-faceted relation between the two concepts of *cinema* and *technology*, *cinema* being characterized through technology, and *technology* through the cinema both as a technical apparatus, a machine, and as a cultural event, a media. What we would like to have shown here is how the construction of the two concepts has been contemporary and interdependent. This has implications for today's situation. The crucial, ontological interrogations that have taken over film studies and connected branches of knowledge with the shift to digital machines and technology, seem to us only partly explained by the actual importance of the changes involved, whether practical, theoretical or aesthetic. Those interrogations arise more deeply from the fact that digital techniques – machineries and processes, apparatuses and workflows – are perceived as belonging to a slightly different conceptual

structure than mechanics. They imply a shift in the concept of *technology*, which is quite perceptible in general culture. Given the way that our concept of *cinema* has been constructed, this shift builds a new conceptual environment around the notion of *cinema*, a new epistemological network that involves a reconstruction of the concept itself, even though the notion may seem unchanged. Understanding "digital cinema" has more to do with historical epistemology than with ontology.

Technē and *Poiēsis*: On Heidegger and Film Theory

Robert Sinnerbrink

> But will not saying both yes and no this way to technical devices make our relation to technology ambivalent and insecure? On the contrary! Our relation to technology will become wonderfully simple and relaxed. We let technical devices enter our daily life, and at the same time leave them outside, that is, let them alone, as things which are nothing absolute but remain dependent upon something higher. I would call this comportment toward technology which expresses "yes" and at the same time "no," by an old word, *releasement toward things* [*Gelassenheit zu den Dingen*].[1]

Heidegger's challenge to the philosophy of subjectivity and his re-thinking of the "question of Being" have transformed modern thought. A number of movements in 20th-century philosophy, such as existential phenomenology, hermeneutics, deconstruction, and French poststructuralism, all owe a debt to Heidegger's work.[2] Yet Heidegger does not seem, at first glance, a philosopher with much to offer contemporary film theory. Heidegger's few explicit remarks on the subject make it clear that he considered cinema (and photography) to be forms of image-making that signify the "end of art" in modernity.[3] As Heidegger asserts, for example, at the end of his essay "The Turning": "we do not yet hear [the call of Being], we whose hearing and seeing are perishing through radio and film under the rule of technology."[4] In *On the Way to Language*, we read that cinema cannot reveal an authentic sense of world since it is "captured and imprisoned [...] within the objectness of photography," a fact that reflects the forgetting of Being typical of the "Europeanization" of humankind and the world.[5] And in Heidegger's *Discourse on Thinking* [*Gelassenheit*], we are told that the "uprootedness" of post-war Europeans is being exacerbated by the ubiquity of the mass media, leading to a generalized condition of "homelessness," an existential "worldlessness":

> Hourly and daily they are chained to radio and television. Week after week the movies carry them off into uncommon, but often merely common, realms of the imagination, and give the illusion of a world that is no world.[6]

This rather unpromising start has not deterred some philosophers and theorists from finding in Heidegger an ally for philosophical thinking in relation to film.[7] In his 1979 foreword to *The World Viewed*, for example, Stanley Cavell remarks on the difficulties presented by the relationship between Heidegger and film.[8] He refers explicitly to Terrence Malick's DAYS OF HEAVEN (1978), a film whose images are not only beautiful but acknowledge the self-referential character of moving images, the way they manifest the play of presence and absence that is inherent in our experience of the world viewed.[9] As Cavell remarks, DAYS OF HEAVEN displays a metaphysical vision of the world, but "one feels that one has never quite seen the scene of human existence – call it the arena between earth (or days) and heaven – quite realized this way on film before."[10] This raises a difficulty for the philosophically minded viewer of film. To ask film theorists to think about Heidegger, as Cavell observes, is to ask them to endorse an "embattled" perspective in Anglophone intellectual culture, one "whose application to film is difficult to prove."[11] On the other hand, to ask academic philosophers to think about film through Heidegger is to ask them to grant film "the status of a subject that invites and rewards philosophical speculation, on a par with the great arts," a concept that is itself brought into question by film, as Walter Benjamin observed long ago.[12] Yet it is undeniable, for Cavell, that the films of Terrence Malick – scholar of phenomenology and translator of Heidegger – have a beauty and radiance that suggest something like a realization of Heidegger's thinking of the relationship between Being and beings, the radiant self-showing of things in luminous appearance.[13]

Cavell was not alone in identifying Malick as a filmmaker whose work could be described as "Heideggerian," even though what a "Heideggerian cinema" might be remains an open question.[14] Heidegger has even inspired a Chris Marker-style documentary-essay film, THE ISTER (David Barison and Daniel Ross, 2004), based on his 1938 lecture course on Hölderlin's poem of the same name.[15] Nonetheless, Heidegger is known as one of the great critics of the modern age, which he famously called the age of the world-picture or world-image [*die Zeit des Weltbildes*], when all of reality is increasingly rendered as an ontologically degraded representational resource on standby for use and consumption.[16] Given Heidegger's evident skepticism concerning photography (and by implication, cinema), what is the significance of his thought for contemporary film/media theory and philosophy of cinema? There are two approaches I shall develop here in response to this question: Heidegger's influential response to the "question of technics" in modernity and its implications for audiovisual media; and the idea of a Heideggerian *poetics*, of modern art as having the poetic power to disclose new horizons and worlds, an idea with fascinating implications for re-thinking what cinema can be.

Heidegger on Cinema

The only passage where Heidegger explicitly discusses a particular film is remarkably suggestive. In "A Dialogue on Language between a Japanese and an Inquirer," two interlocutors, the Inquirer and his Japanese guest, converse on the relationship between Western rationality and its dominance over the East Asian sense of art and world.[17] They are concerned, in particular, to explore the meaning of the Japanese term *iki*, which turns out to have a much broader and deeper meaning than the Enlightenment concept of "aesthetic experience." In the course of their discussion, the Inquirer warns against the tendency to follow Western conceptual thought, for all its technological achievements, because this will blind us to the increasing "Europeanization of man and the earth [which] attacks at the source everything of an essential nature."[18] As an example of this all-consuming Westernization, the Japanese guest suggests, surprisingly, Akiro Kurosawa's RASHOMON (1950). The inquirer is perplexed, for he found RASHOMON utterly enchanting, above all its subdued gestures: "I believed that I was experiencing the enchantment of the Japanese world, the enchantment that carries us away into the mysterious."[19]

Fig. 1: RASHOMON (1950): "The enchantment of the Japanese world."

Count Kuki explains that the film was overly realistic, particularly in the battle scenes, which makes it far removed from the tradition of Japanese art and drama. He hastens to add that it is not the realism of metaphysics but a realism pertaining to the ontology of the cinematic image. As Kuki observes, it is not so much the film's dramatic or cinematic aspects but that the Japanese world is filmed at all, "captured and imprisoned at all within the objectness of photography," that

makes RASHOMON an example of Western techno-rationalization.[20] Regardless of the film's undoubted aesthetic qualities, Kuki explains to the Inquirer that "the mere fact that our world is set forth in the frame of a film forces that world into the sphere of what you call of objectness."[21] And this "objectification" of the world through photography and film, moreover, is "already a consequence of the ever wider outreach of Europeanization."[22] The Inquirer (a stand-in for Heidegger, one presumes) thus begins to understand Count Kuki's concerns:[23] far from presenting the "enchantment of the Japanese world," Kurosawa's RASHOMON shows us the incompatibility between this Eastern sense of world, still replete with a sense of Being, and the Westernized, "technical-aesthetic product of the film industry" that suffers from a nihilistic loss of Being.[24] In short, cinematic art intensifies, rather than reverses, the "objectification" of beings that is symptomatic of the Western forgetting of Being. The conclusion drawn from this brief episode in the dialogue is stark: movies are symptomatic of our Western nihilistic desire to "objectify" reality, to reduce the world, in its richness and mystery, to representational images, to an aesthetic "resource" for our manipulation and consumption.

While intriguing, this passage is hardly a promising start for thinking about the relationship between Heidegger and cinema. Indeed, it suggests that cinema is nothing but a pernicious manifestation of the technological "enframing" of the world (what Heidegger calls the "essence" of modern technics as the reduction of reality to a stockpile of available resources).[25] It is also a curious discussion of Kurosawa's work, given the latter's explicitly hybrid character, fusing Japanese with Western literary traditions (Shakespeare, for example), and its revitalization of the Western action genre by combining it with martial aspects of Japanese drama.[26] Its importance, however, lies in the way that Heidegger underlines the metaphysical importance of the image in modernity, which is defined by the reduction of the world to what can be represented directly, objectified by technical means, and thus to what corresponds with the cognitive interests of the human subject. Both of these ideas have profound implications for thinking about the cinema.

Heidegger and the "Question of Being"

To explore Heidegger's significance for film theory, however, we must begin, albeit briefly, with Heidegger's fundamental question. Heidegger's entire body of work is an extended meditation on this question: what is the meaning or sense of Being [*Sein*] as distinct from beings or entities [*das Seiende*]? Traditionally, in the history of philosophy, this question concerning Being took the form of an inquiry into the Being of beings or entities as such and as a whole;[27] a decision that, according to Heidegger, has had profound effects on the subsequent history of metaphysics from Plato to Nietzsche.[28] In *Being and Time*, Heidegger points out

that the various "prejudices" concerning the meaning of Being – that Being is the most "universal" concept, that it is an indefinable concept, and that it is self-evident – indicate that the question of Being not only lacks a coherent answer but remains problematic and obscure.[29] On the other hand, something like "Being" is always already understood in our everyday language and in our practical comportments toward the beings or entities we encounter in the world. This obscurity of the concept of "Being," along with our everyday pre-understanding of it, points to a fundamental difficulty in our philosophical understanding. Hence the need for an explicit repetition of the inquiry into the meaning of Being, unfolded through a preparatory interpretation of the Being of that entity which we ourselves are – what Heidegger calls "Da-sein."[30]

We are familiar with useful beings in our everyday comportment toward items of equipment in our environment. We also have a "preontological" understanding of Being in the sense of grasping the familiar beings that show up in our shared being-in-the-world. But do we understand or have an intuition of the "clearing," "horizon," or "lighting of Being" [*Lichtung des Seins*] through which beings show up as intelligible at all? We might gloss this clearing or lighting as the event of presencing or of originary *world-disclosure*. An experience of the clearing of Being, for Heidegger, is precisely what we have lost in modernity, an epoch defined, since Descartes, Kant and Nietzsche, by the metaphysics of human subjectivity. Being, however, cannot be reduced to what is present or representable for a human subject. Being is not something that we grasp only thanks to the thought, language, or action of human beings. Rather, the thought, language, and action of human beings show up as meaningful only within the clearing of Being. We must not think of temporal "projection" and understanding in terms of a "representational positing," otherwise we are taking these, in accordance with modern metaphysics, to be the achievements of self-grounding subjectivity.[31] Indeed, if we take as our guide the manner in which Being is intelligible for us, we end up "subjectifying" Being: mistaking the limits of human meaning-making for the limits of Being as such. Heidegger thus proposes that we investigate the way of Being of that entity which we ourselves are: self-interpreting, finite, historical beings for whom our own existence is an issue. *Dasein*'s way of Being, namely *existence* [*Existenz*], turns out to be complex. *Being and Time* thus goes on to interpret the fundamental "structures of existence" in terms of three interconnected ontological levels: pragmatic *being-in-the-world*, existential *care*, and "ecstatic" (phenomenological-existential) *temporality*.

In his later thought, Heidegger observed that the quasi-transcendental project of *Being and Time*, indebted to the phenomenology of Husserl, was a necessary starting point for inquiring into the question of Being but still remained embedded within the modern metaphysics of subjectivity. The existential analytic of *Dasein*, which Heidegger also called "fundamental ontology," failed to make the transition to a genuinely post-metaphysical mode of inquiry into the truth of

Being. It fails to make clear Heidegger's famous "turning" [*Kehre*] to "this other thinking that abandons subjectivity," since it remains framed within, and described through, the language of the "metaphysics of the subject."[32] This "turning" toward the question of the truth of Being – the meaning of Being independently of beings – is what Heidegger undertakes during the 1930s and after WWII, when he turns away from more traditional philosophical discourse, embraces a "poetic" manner of thinking, and poses "the question concerning technology" as the fundamental challenge facing the modern age. As we shall see, cinema, as the technological art *par excellence*, presents important challenges for Heidegger's account of modernity, technology, and art.

The Question of Technology

In the essay "The Question Concerning Technology," Heidegger attempts to think through the essence of technology in order to "prepare a free relationship to it."[33] The ethical dimension of this project is clear: through developing a thoughtful relationship with the essence of technology, we might experience the possibility of a freer relationship with the technological world. Such a relationship will open up our human existence to the essence of technology, which now dominates our experience of reality (nature, culture, and history). It would mean that we were no longer "enslaved" to technology, and thus more able to find a way of inhabiting the technological world that no longer does violence to our own nature (which is to "dwell" as thinking beings) or to Nature as such. The motivation and aim of Heidegger's questioning of technology is therefore *ethical*, in that it aims to clarify how we should best live in a free and fitting manner within our technologically disclosed world.

Heidegger begins by pointing out that the essence of technology, meaning that which enables technology in the ordinary sense to hold sway, is not itself anything technological. When we think of technology we might think of machines, technical apparatuses, modern science, cybernetics, computers, the Internet, and so on. In short, the technical amplification of human power to control our natural and cultural environments and possibly to enhance human life (though technology harbors both productive and destructive potentials). While these phenomena are certainly relevant, they do not really capture the essence of technology. They do not tell us how technology *is* the way in which Being is disclosed in modernity. Indeed, Heidegger is at pains to insist that there is nothing to be gained by rejecting technology (as though that were possible) or denouncing it "as the work of the devil."[34] The point is to understand our current relationship of enslavement and misunderstanding in order to better prepare for the possibility of a free relationship to technology. Heidegger is therefore not engaged in any "neo-Luddism"[35] or nostalgia for a pre-modern age, despite his penchant for Black Forest mountain huts and solitary forest paths. What matters is to think

through the essence of technology so as to no longer experience it in a "metaphysical," that is, a totalizing and instrumentally ordered way.

An obvious definition would be to say that technology is the product of human activity, the application of knowledge to provide a "technical means to a human end."[36] This instrumental definition is certainly correct; yet Heidegger argues that it does not capture what is truly essential about modern technology. To grasp this we must attempt to uncover the deeper phenomenological dimension of *poiēsis* or "bringing-forth" that underlies our inherited understanding of causality and instrumentality (the producing of technical means to achieve a desired end). We must endeavor to understand *poiēsis* in its originary meaning, which neither refers merely to "handicraft manufacture," nor just to "artistic and poetical bringing into appearance and concrete imagery."[37] Rather, *poiēsis* or bringing-forth includes the understanding of Nature as *physis*: as self-blossoming emergence, the "arising of something from out of itself."[38] This bringing-forth of something into appearance means bringing it out of unconcealment and into the realm of what is manifest to perception and available for practical use. In other words, poetic bringing-forth reveals beings in the light of *truth* or *aletheia*, where truth is understood in a Greek sense as a revealing or an unconcealing rather than as correspondence between propositions and states of affairs.

Modern technology must be understood, then, in terms of *revealing*, that is, as a way in which beings are made manifest for practical manipulation and theoretical contemplation. But we need to clarify the difference between modern technology and other forms of technology. What kind of revealing is at play in modern technology? How does it make beings manifest for theoretical knowledge and practical use? Modern technology does not reveal in the mode of poetic bringing-forth, revealing something and allowing it to reveal itself as it is (a self-generated process in the case of natural phenomena; an assisted process in the case of cultural artifacts). On the contrary, modern technology reveals beings in the mode of an excessive or violent *challenging-forth*: "The revealing that rules in modern technology is a challenging [*Herausfordern*], which puts to nature the unreasonable demand that it supply energy which can be extracted and stored as such."[39] Modern technics refers to our way of inhabiting the world and using our environment as revealed, mediated, and propelled by technology.

One might respond that surely all technology, even the most rudimentary, functions in this manner. There are surely some forms of technology – so-called "primitive" technologies, or ecologically sustainable technologies – that do not function by means of a "violent" challenging-forth. Such ecological forms of technology certainly use environmental energy resources, but they do not forcibly extract it and store it into as an available but exhaustible resource. In fact it is not the extraction and storage of energy resources that is the problem. Rather, it is the reduction of Nature to *nothing but* a stockpile of potential resources that Heidegger regards as characterizing the violence of modern technology.[40] Modern

technology *forcibly* and *exclusively* transforms all natural beings into potential resources: "Air is now set upon to yield nitrogen, the earth to yield ore, ore to yield uranium, for example; uranium is set upon to yield atomic energy, which can be unleashed either for destructive of for peaceful purposes."[41] To which we might add that language is set upon to yield informational resources, genetic material is set upon to yield biological resources, chemical and biological entities to yield industrial, medical, and military resources, human energy, action, and ingenuity are harnessed for economic purposes, and so on.

An important aspect of this inappropriate challenging-forth in modern technology is that it is always geared toward *expediting*, that is, *unlocking and exposing*, the latent energies in nature in the service of maximizing efficiency: "i.e., toward driving on to maximum yield at the minimum expense."[42] But this process is not only discernible in the technological approach to Nature; it is also present in the challenging-forth of energies in our social, cultural, and political environments. Here we could mention the production of energy resources and commodities for technical use and market consumption, the endless circulation of investment, stocks, and information within the networks of global capital, but also the manipulation of so-called "human resources" available for deployment within social institutions, commercial enterprises, and economic processes.

Modern technology must therefore be understood as a way of revealing that has the character of a setting-upon both nature and culture; one that functions by the excessive challenging-forth of energies to be extracted and stored. The technological mode of challenging-forth is a dynamic process of unlocking, transforming, storing, and networking energies in an endless cycle of production and consumption whose aim is self-perpetuation and immanent expansion (for example, the global economy). This endless cycle of technological production and consumption involves constant *regulating* and *securing*, the "chief characteristics" of the technological mode of revealing the world.[43] The kind of truth revealed in this way Heidegger calls *Bestand* or "standing-reserve"; that is, modern technology reveals beings in the world exclusively in the mode of *resources* available for use. "Everywhere everything is ordered to stand by, to be immediately on hand, indeed to stand there just so that it may be on call for a further ordering."[44] *Bestand* designates the technological mode of revealing the world through the violent challenging forth of its energies, transforming reality into a permanently ordered and available stock of resources.

A jet airliner standing on the runway, to use Heidegger's example, is no longer just an object but a technical resource ordered "to insure the possibility of transportation."[45] As a whole and in each of its (technical and human) parts – crew and passengers, pilots and air traffic controllers, computer navigation systems, jet engines, engineering staff, ground crew, security, and so on – the airliner is revealed as a resource permanently "on call for duty, i.e. ready for takeoff."[46] Heidegger's claim that we no longer inhabit a world of subjects confronting ob-

jects "standing" over against us is attested by the contemporary trend toward de-objectified, networked resources. The computer is an information interface, the mobile telephone a "personalized" communication resource on permanent standby; we too become communication resources permanently "on call" within social, electronic, and economic networks.

What is the role of human beings within the technological disclosure of reality as a stockpile of resources? Are we responsible for this technological ordering and stockpiling? Or do human beings themselves belong to the standing resources ordered and available for use? Heidegger's point is that technology is not simply a human invention; rather, it orders human beings within its systemic process of revealing, producing, and managing resources. Indeed, the social and economic consumption of "human resources" is now routinely accepted as an unalterable fact of modern life. This linguistic usage is evidence of a real transformation occurring in our self-understanding as much as in the technological ordering of the modern world. The epoch of modern technology is not simply the handiwork of human beings; rather human beings are themselves part of the general technical process of revealing and transforming reality into a totality of stockpiled resources. This process is how Being presents itself or manifests historically in modernity, which is not simply a matter of human action, although it requires human action in order to take place.

Heidegger thus arrives at his provisional answer to the question concerning the essence of technology. This violent challenging that gathers up human beings in order to reveal actuality as available resources is what he calls *en-framing* or *Ge-stell*. What does this mean? *Gestell* is an ordinary German word (meaning frame, apparatus, skeleton or framework) which is used to designate the essence of modern technology: the gathering of human beings along with other beings into the forced revealing of actuality as a totality of available resources.[47] Heidegger's "definition" of *Gestell* reads as follows:

> Enframing means the gathering together of the setting-upon that sets upon man, i.e., challenges him forth, to reveal the actual, in the mode of ordering, as standing-reserve.[48]

Let us unpack this obscure remark a little further. The essence of modern technology refers to the systemic process by which human beings are integrated into the violent transformation of nature (and culture) into productive resources available for use. Human beings, however, are not solely responsible for this technological transformation of the world. Rather, we are "challenged forth," through technological enframing, to contribute to the revealing of entities, via scientific and technical means, as a stockpile of potential resources. Modern technics as enframing, in short, amounts to the "resourcification" of reality (to coin an ugly term): the reduction of beings as a whole to a totality of resources. As Heidegger

remarks in his *Discourse on Thinking*: "Nature becomes a gigantic gasoline station, an energy source for modern technology and industry."[49]

Heidegger's term enframing or *Ge-stell*, however, is ambiguous: it not only evokes the sense of setting up and setting upon; it also evokes the sense of producing [*her-stellen*] and presenting [*dar-stellen*]. En-framing thus points to two kinds of revealing: 1) the violent challenging-forth characteristic of modern technics, and 2) the artistic or creative bringing-forth of *poetic making*. If we remember that the Greek term *technē* refers to craft, skill, and know-how, the point becomes clearer. Technological enframing refers to the "violent" challenging-forth characteristic of modern technology, which threatens to reduce all beings, including human beings, to available resources. Poetic making, by contrast, refers to the gentler, creative mode of bringing-forth manifest in art, craft, practical skills, and "ecological" forms of technology that do not violate the integrity of beings but rather enable them to presence in different ways. This essence of technology, Heidegger argues, must therefore be understood as *fundamentally ambiguous*. The "danger" in technological en-framing, however, is that the "violent" mode of challenging forth will become all pervasive. The danger lies in the capacity of modern technology to *obliterate all other forms of revealing*, above all the poetic bringing-forth characteristic of art and non-violent forms of technology.

This danger manifests itself more concretely in two related ways: by the *disappearance of free-standing objects*, now construed as resources for use; and by the *self-interpretation of human beings* who come to experience each other merely as exploitable resources. This twofold danger Heidegger articulates as follows:

> As soon as what is unconcealed no longer concerns man even as object, but exclusively as standing-reserve, and man in the midst of objectlessness is nothing but the orderer of standing-reserve, then he comes to the very brink of a precipitous fall; that is, he comes to the point where he himself will have to be taken as standing-reserve.[50]

Part of the danger of modern technology is that we seem blissfully unaware of this threat to our nature as dwelling or thinking beings. Instead, this threat is neutralized by the self-assertion of human power and the belief in technological progress. In this way, as Heidegger presciently observes, "the illusion comes to prevail that everything man encounters exists only insofar as it is his construct."[51] The danger posed by technological en-framing thus amounts to a twofold threat: a threat to other ways of revealing the world, notably to poetic bringing-forth as accomplished by art; and a threat to our "human essence" as dwellers within the clearing of Being (beings with an ethical responsibility toward those entities we contribute to revealing and using for our own purposes). Far from glibly celebrating the "post-human" condition, Heidegger underlines the danger inherent in the metaphysical-technological misinterpretation of hu-

man beings, and of all other beings, as manipulable resources. This ambiguity of modern technology is not simply a matter of human decision, nor can it be eradicated by the application of technical reasoning, rational planning, or utilitarian calculation. It remains an historical "destiny," a sending or destining [*Geschick*] that defines our historical experience of modernity; it is the way that Being reveals itself through the ambiguous processes of technological en-framing.

Art as "Saving Power"

What positive potentials are there within modern technology? How might we develop a "freer" more ethical relationship with it? Heidegger cites in response the poet Hölderlin's now famous lines: "But where danger is, grows/The saving power also."[52] This "saving power" indicates the possibility that technological enframing might harbor the possibility of a different way of revealing truth; a non-instrumentalist, no longer "metaphysical" experience of "poetic revealing."[53] "Poetic" is taken here not in the sense of a romantic nostalgia, but in the sense of a bringing forth that allows things to appear in their truth, to show themselves in radiant appearance: a *poiēsis* paradigmatically found in the *work of art*. To clarify this thought, Heidegger emphasizes the "originary" character of the Greek artwork as a way of revealing truth, of setting truth to work in an ontological sense (revealing the truth of a being through the work, and experiencing the work as an expression of truth).[54] Such *ontological* revelation of truth through art, Heidegger maintains, occurred in ancient Greece, "when the bringing-forth of the true into the beautiful was called *technē*," when art "illuminated the presence [*Gegenwart*] of the gods and the dialogue of divine and human destining."[55] Archaic art, which was *poetic art*, set truth to work in the dynamic conflict between world and earth (roughly speaking, culture and nature).[56] Art manifested or revealed Being by bringing forth and presenting beings through sculpture, drama, poetry, and architecture (the temple). Taken in its broadest sense, art in its archaic form "therefore belonged within *poiesis*."[57] Within the ambiguous condition of technological modernity, Heidegger intimates, the saving power can be found in the way the *poietic* work of art can still reveal the truth of beings: disclosing aesthetically their distinctive ways of Being as what we come to experience through the work.

The problem is that Heidegger appears at times to exclude the *modern* work of art – including cinema and photography as the technological art forms *par excellence* – from any such poetic revealing of truth. Indeed, he explicitly contrasts the degraded character of the modern artwork with the authentic *poiēsis* or bringing-forth of the (auratic) artwork that is capable of setting truth to work.[58] For the Greek world, unlike in modernity, art is still enchanted: "The arts were not derived from the artistic. Artworks were not enjoyed aesthetically. Art was not a sector of cultural activity."[59] In contrast with modern art, or the aesthetic prod-

ucts of the culture industry, the authentic archaic artwork was a *technē* in the service of *poiēsis*. Heidegger's emphasis on *poiēsis* thus suggests that only a return to *auratic* art, to an archaic mode of poetic revealing, will be capable of "fostering the saving power" in modernity.

Heidegger's recourse here to a *pre-modern* conception of art, however, indicates a tension in his thinking on modern technology. As Walter Benjamin points out, technological artworks no longer possess an *aura* – a singular presence and uniqueness – due to radical changes in the historical, cultural, and social meaning of art wrought by the advent of technical reproducibility.[60] According to Benjamin, technically reproducible, post-auratic artworks liberate art from the rigidity of tradition, dissolve the claims of originality, unique presence, and take on an ambiguous political function.[61] The technological art forms *par excellence*, namely photography and cinema, shatter both the modern aesthetic conception of expressive art and the archaic conception of the sacredness of the artwork as cultic object. Yet for Heidegger it is this auratic conception of the artwork, represented by the cultic work (poem, temple, tragedy), that might "expressly foster the growth of the saving power, may awaken and found anew our vision of, and trust in, that which grants."[62] Heidegger's thinking in regard to film, from this point of view, remains overly restrictive. Only auratic works of art, Heidegger seems to suggest, harbor the "saving power" that could keep open other ways of revealing the truth of beings. Can a Heideggerian way of thinking about cinema help foster the "saving power" in modernity?

Cinema as *Poiēsis*

In conclusion I would like to explore some ways of thinking about cinema that Heidegger's thinking on technology makes possible. Despite his critique of photography and cinema, there are insights in Heidegger's thinking that allow us to understand cinema as *poiēsis*, as a medium of "poetic revealing."[63] As Heidegger goes on to observe, technological en-framing opens up the possibility of new ways of revealing the world. Modern technology, understood as enframing, harbors the possibility of a creative "bringing-forth," a poetic revealing of truth, even a new way of experiencing the "event of Being" (the latter is what Heidegger calls *das Ereignis*: the appropriative event of world-disclosure that relates human beings, beings, and Being in historically distinctive ways).[64] The essential point to note is the fundamental *ambiguity* of modern technology: since it is not possible that *all* of reality will be reduced to a totality of resources, "precisely the essence of technology must harbor in itself the growth of the saving power."[65] The question concerning technology thus turns out to be a question concerning *truth*: a question of "the constellation in which revealing and concealing," that is, "the essential unfolding of truth," happens as an event.[66] This means that we must look to technological enframing, examining the ways in which modern technol-

ogy reveals the world, in order to find new ways in which truth might happen, different ways we might experience the "worlding of the world." What appears, from one perspective, as the "danger" posed by modern technics also opens up, from another, the possibility of new ways of being and thinking: "the essential unfolding of technology harbors in itself what we least suspect, the possible rise of the saving power."[67]

Cinema is the technological art form *par excellence*; one that participates in the very ambiguity of modern technology, its danger and its saving power. It is not simply an instrument of representational objectification, or a means of reducing art to an aesthetic resource designed to elicit sensation. Rather, it has the capacity to construct and reveal worlds, virtual and fictional, that can disclose different aspects of our own being-in-the-world. Cinema is a technological medium of poetic revelation with the capacity to reveal the truth of beings, even our own experience of world-disclosure (the "worlding of the world"). This is an insight that many other theorists have intimated, albeit from different theoretical perspectives. Whether through the "mummification" of time and consciousness (Bazin), the "redemption of physical reality" (Kracauer), or uncovering the "optical unconscious" (Benjamin); whether as a series of "automatic world projections" that both express and undo skepticism (Cavell), or as the presentation of perception, affect, and thought through assemblages of movement- and time-images (Deleuze, phenomenology); cinema can be also understood, following Heidegger's account of the essence of technology, as a technological medium capable of the poetic revealing of truth, a creative bringing-forth, the disclosure of virtual worlds by audiovisual means.

In other words, we can think of cinema, adapting Heidegger, as a medium of *poiēsis*: a medium of the "poetic revealing" of beings, worlds, and different aspects of existence. By "cinematic *poiēsis*" I mean a revealing or bringing-forth of complex virtual worlds; the technologically mediated projection and disclosure of a world through audiovisual images. Cinematic *poiēsis* articulates film's "truth-disclosing" power to present time, capture movement, express meaning, or reveal aspects of our experience of world that might otherwise remain obscured or marginalized. This "Heideggerian" conception of cinema can supplement the more traditional representational and narrative focus on film as presenting objects instrumentally within the action-directed schemas of psychologically motivated subjects. One need only compare, for example, a film like Malick's THE THIN RED LINE (1998) with Spielberg's SAVING PRIVATE RYAN (1998) to see the contrast I am proposing here. Many of Malick's films perform this kind of cinematic revealing of world, staging the poetic difference between saying and showing, between the horizons of the world revealed through mood and the particular finite existence of individuals acting within these world horizons. THE THIN RED LINE, for example, enacts a cinematic *poiēsis*, revealing different ways in which we can relate to our own mortality, the "happening of Being" or

Fig. 2: Revealing worlds: Malick's The New World *(2005).*

radiance of Nature. Malick's The New World (2005) projects a cultural and historical clash of worlds, exploring the (Western) desire for conquest and domination, the ambivalent power of romantic love, and the need to acknowledge a deeper (spiritual) unity with nature. Through images of non-human nature, which both frame and interrupt the clash between Old and New Worlds, The New World discloses cinematically and poetically the sublimity of nature understood as elemental earth, that which underlies and supports any historical and cultural form of human community.

The Tree of Life (2011) also engages in "poetic revealing," capturing an aesthetically transfigured reality – attentive to contingency, nature, and mood – through radiant images of place and duration. As a number of critics have noted, Malick's films express a cinematographic fascination with light, what one might call his films' Neo-platonic equation between light and life. Such "theophanic" cinematography is a way of using the technology of cinema to express the intimate relationship between human beings, nature, and the complexity of everyday experience. We might call this the luminous "realism" of Malick's cinema; its Bazinian power to capture an aesthetically transfigured reality – attentive to contingency, nature, and mood – through radiant images of place and duration. Almost every outdoor shot in The Tree of Life , for example, displays the setting or rising sun, in the background yet shining brilliantly through trees, radiating across faces, a poetic disclosure of the everyday world: images that express the ontological, or better, the *ontopoetical* power of beauty to reveal the truth of beings, to manifest the beauty of "all things shining." This poetic revealing in Malick's work is enacted not only at the level of narrative content, visual style, and musical expression. It involves the very capacity of cinema to reawaken different kinds of attunement or mood through sound and image, revealing otherwise concealed aspects – visual, aural, affective, and temporal – of our shared cultural and historical being-in-the-world. In this sense, Malick's films enact a

Fig. 3: Cinema as poiēsis: Malick's The Tree of Life *(2011).*

poetic revealing that shows the capacity of cinema to reveal truth and disclose new worlds; a *technē* that, in Heidegger's words, expresses a "revealing that brings forth into the splendor of radiant appearance," a poetic "bringing-forth of the true into the beautiful"[68] – or cinema as *poiēsis*.

A "Heideggerian" approach to cinema can embrace many ways of being, from phenomenological depictions of different modes of existence, a questioning of the dangers and promises of modern technology, to exploring poetic ways of disclosing new worlds.[69] All of these approaches, moreover, presuppose that we have considered the ontological question of the nature of the cinematic image and its capacity to provoke thought; a question that Heidegger's challenge to modern philosophy and confrontation with technology helps us to appreciate, experience, and think anew. At the same time, and in keeping with Heidegger's account of the *ambivalence* of modern technology, it is important to temper Heidegger's critique of the representational capacity of cinema and to acknowledge the interplay between representation and poetic dimensions of cinematic world-projection. A cinematic world has, on the one hand, a *representational* aspect of identifiable objects, places, characters, actions; on the other, it has a *poetic* or expressive aspect that is revealed in mood, affective attunement, sensuous aesthetic engagement, and our experience of temporality. Heidegger's critique of modern technology can help us acknowledge this often neglected dimension of cinematic *poiēsis* as an important supplement to representationalist theories of cinematic experience. From this point of view, cinema is the technological art form that most intimately reveals the ambiguity of modern technology as both a danger to our nature as thinking beings and as a "saving power" that might point to new ways of inhabiting the technological world. It can help us experience and

cultivate an attitude of detached engagement: a *releasement* [*Gelassenheit*] toward things or a "letting be" of beings, a shift in sensibility and attitude that might open up a more "free" relationship with the technologically mediated worlds in which we live. Despite Heidegger's warnings about the "danger" posed by audio-visual media, we can think with Heidegger (and against Heidegger) by exploring the "mystery" of cinema:[70] how it can be a poetic medium of projecting and revealing worlds, a radiant bloom in the desert of technology.

Stiegler's Post-Phenomenological Account of Mediated Experience

Patrick Crogan

> [C]inema is a new experience of life that begins in 1895. These dates, 1877 [the invention of phonography] and 1895, constitute two immense turns in the organological history of the power(s) to dream.[1]

Introduction

Bernard Stiegler's analysis of cinema represents an important contribution to attempts to rethink film at the current juncture of the "end of cinema" and the emergence of the "post-cinematic" digital milieu. This is not, however, its primary purpose or disciplinary context. Within the ambit of its larger concerns, Stiegler's *Technics and Time* series develops a substantial critical renovation of phenomenological approaches to experience by addressing the mediation and transmission of experience through techniques and artifacts. In this regard I will examine Stiegler's notion of the "industrial temporal object" – primarily instantiated for him by cinema as pre-eminent media form of the last century. In order to understand the significance of this new theorization of cinema in the context of Stiegler's wider project, I will first give an overview of his account of the role played by technics in general, and mnemotechnical forms in particular, in the dynamics of human life as a form of "technical life."

Cinema is also a principal progenitor of the analog, analogico-digital and digital audiovisual media forms that have emerged in recent decades. This "post-cinematic" period might best be described as lying between the epoch of analog media (photography, phonography, radio, cinema, broadcast television) and the epoch of the digital systems of recording, representation, communication, simulation and so forth, an epoch which is only commencing to unfold.[2] I term this period the "digital transition," a term which should be read as retaining the question, "transition to what?," while also citing the pervasive, default – if ambivalent – sense of the inexorable "progress" of the digital revolution toward a global, "realtime," "immaterial" technocultural future. In this period the sense of "disorientation" arising from the mismatched speeds of technical, political-economic and cultural change increases. For Stiegler, while "disorientation" is ori-

ginary for the human, it is allayed by cultural political "meta-stabilizations" of the interface between the developmental rhythms of technics and sociocultural ways of life. Just how to achieve such a meta-stabilization, and what its character could or should be are in question in the digital transition – for there is nothing inevitable about the outcome of the current processes of technocultural change in their unprecedented global reach and accelerated implementation. Stiegler's account of cinema is less about what is to become of cinema (or indeed of film studies in the transformation of its object of study) and more a central part of his philosophical project of responding to both the accentuated experience of "disorientation" felt in the digital transition and to the critical and cultural potentials it harbors.[3] Its value to film theory is nonetheless twofold: it represents, as Tom Gunning has recognized, an important reconsideration of cinema as a technocultural form that has transformed human life's potentials and possibilities on a global scale; secondly, Stiegler's post-phenomenological characterization of cinematic experience offers crucial insights into how the post-cinematic digital media are transforming the conditions of the production of experience today.[4]

The Organological Perspective on the Human as "Technical Life"

Elaborated across the second and third volumes of the *Technics and Time* series, Stiegler revises Husserl's influential phenomenology of internal time consciousness with a decisive post-phenomenological complication of how the "temporal objects" of consciousness are constituted. The role of exterior forms of recording, synthesizing and communicating experience – what Stiegler calls mnemotechnics – is crucial in this revision of Husserl's phenomenology. Mnemotechnics are not only memory aids or supports, they are forms of memory that are constitutive of human experience in an intrinsic and essential way. This instantiates one of the major tenets of Stiegler's philosophy of technology – that the human cannot be properly conceived of without thinking of it as a "technical" form of life, one whose development rests not only on genetic but cultural memory. The human's ethnocultural becoming rather than species becoming is constituted in and through the combination of the human biological organism with the "organized but inorganic matter" of the tool or "*organon*."[5] Understood in this way, the tool is not only an instrument in the hand of the user of tools and invented for his/her purposes, but an organic supplement that has already played its part in framing the user's experience of life's purposes and possibilities. The "*what* invents the *who*, just as much as it is invented by it" argues Stiegler, complicating Heidegger's fundamental distinction between two kinds of being – those of which one can ask "who?" or "what?" kind of questions.[6]

"Ephiphylogenesis" is the name Stiegler gives to this new kind of becoming of the living in *Technics and Time 1*, describing it as an ongoing dynamic between the "organic organized" individual and its environment, mediated by the "*organon*."[7]

Beyond the circumstances of its particular use or invention, the *vital* significance of the non-living *organon* is its ability to function as exterior record of a context and manner of usage, and of the gestures and processes involved in its production. Techniques and artifactuality in general are the material substrate of the transmission of ways of living, including ways of reliving, remembering, revising reinventing and even revolting against those ways.

It is on the basis of this memorious capacity of technics in general and the role it plays in ethnocultural individuation that dedicated "mnemotechnical" forms developed, forms whose function was to exteriorize experience, make it communicable, collective, recoverable and transmissible. Language, a medium whose conventionality enables the expression of interiority in a form that others can understand, is both key instance and agent of this emergence of mnemotechnics. The uncanny "technicity" that characterizes human life is perhaps nowhere more keenly felt by many than in human language – both utterly internal, intimate and "ownmost" (as Heidegger would say), the very means of crystallizing one's sense of self, and yet also an acquired competence, rule-bound, arbitrary, constantly changing under the impetus of a continuous, collective evolution.

The advent of figural and symbolic graphic inscription marks another decisive emergence in the becoming of human "technical life" by inaugurating a long history of what Stiegler terms the "grammatization" of the mnemotechnical articulation of experience. Initiated (so far as we know) with cave art, the oldest known examples of which are dated around 30,000 years ago, grammatization "refers to the process by which the mental temporal flows experienced by the psychic individual are recorded, reproduced, discretized and spatialized."[8] In cave art the experience of encounters with predatory environmental competitors, of hunting and fighting, of sexual difference and the fecundity of women are recorded and hence made available for re-living or, more precisely, for re-temporalizing, in shared verbal and gestural rituals of remembrance. These recordings are reproducible, in successive iterations and elaborations of the cave inscriptions, and in their translation to other sites for the collective exteriorization of ethnographic experience across a territory.[9] As artifactual, these recordings are concretized as material, spatial forms, like the tools and the jewelry and other adornments (including, most likely, bodily inscriptions) that predate them, and the fixed and mobile supporting "media" that emerge in the long history of grammatization's elaboration, from cave art all the way down to the book, the gramophone record, the film, the cassette, and the disk. "Discretized": an experiential continuum is rendered through a process involving a technique of tool use, which can itself be further exteriorized in successive developments of production technics and technologies. This rendering of "mental temporal flows" operates by a division of the flow into separate elements that are assembled together in the spatialized, grammatized form. Various lines compose the image of the running horse, evoking its movement through space. Separate compositional ele-

ments appear in several cave art sites; some are interpreted by evolutionary anthropologists as "female symbols" (abstracted figurations of the vagina – already generalized here as "the vagina," symbolizing "woman" in general), or whose significance remains less certain, but are clearly a discrete and repeated element.[10]

Writing, whose ideographic beginnings are composed in Leroi-Gourhan's view both by this abstracting, symbolic pole of the earliest cave graphics and the more analog, representational markings, composes its recordings of interiority out of discrete elements and develops modes of sequencing their "reading" to reproduce an articulation of what their author(s) deemed necessary or worthy of recording.[11] Writing and imaging then, interrelated from their initial emergence in rupestral graphics, begin their co-implicated trajectories of the differentiation of this "new empathic possibility" of the grammatization of shared experience.[12] With the development of phoneticized and linearized scripts in the Middle East – associated by Leroi-Gourhan with the rise of agricultural society and the emergence of new labor divisions, hierarchical social structures and trading economies in permanent settlements – a new phase of literate, orthographic mnemotechnical grammatization commences.[13] The "religions of the book," but also the cultures, economies, arts and sciences, politics and philosophies, not to mention histories "of the book," are possible on the basis of this phonetic, orthographic artifactuality.[14]

Over the last century or so, the unprecedented power of orthographic *analog* image and sound technologies – phonography, photography, radio, cinema, television – technoscientifically and industrially produced and disseminated globally – shifted the predominantly literary grammatizing conditions of the West's technocultural transformation of ethnocultural becoming. Today the "digital transition" affects the conditions in which all mnemotechnical media, figural and symbolic, analog and digital, make experience communicable, memorable, and culturally valuable.[15]

Cave art is a matrix and point of departure for the era of grammatized "mnemotechnicity," by which term I mean to evoke the co-constitutive dynamic between psychic and collective, cultural becoming animating and mediated by mnemotechnical forms. According to Stiegler's account of the historical and technically composed conditions of human being-as-becoming it is necessary to distinguish the changing epochs of mnemotechnical mediation, for example from ideographic to phonetic scripts, from hand-copied manuscripts to the printing press, and from the graphic traditions to the industrial forms of mechanical reproduction of exterior phenomena. In "An Organology of Dreams," however, Stiegler draws inspiration from the extraordinary graphics discovered on the walls in the Chauvet cave in 1994 when he characterizes the general condition of human experience since grammatization as "archi-cinema."[16] This is in part a citing and updating of his mentor, Jacques Derrida's "archi-writing" (and

"archi-trace"), terms which in Derrida's *Of Grammatology* referred to the irreducible relation between "living" speech and the non-living writing artifact as extrinsic, codified, technical form of communication and expression (what Stiegler will call "grammatized" communication). Stiegler acknowledges as definitive Derrida's account of the intrinsic role of the technical "supplement" in our very conception of what is integral, and essential to the human as conscious, living present.

As an "updating" of this central Derridean notion of archi-writing, Stiegler also points toward his more situated, engaged revision of Derrida's "archi-" formulation toward a more historical and strategic one. On the one hand "archi-cinema" broadens the parameters of Derrida's concerns with the philosophical implications of the written technical supplement in going back to the graphic markings of rupestral art as key moment of historical emergence of this new "empathic possibility" of grammatization. On the other hand, it situates the theoretical task of coming to grips with the "technical supplement" as one that is both more historical in character and more specifically addressed to and emerging from the contemporary conditions in which it emerges as an increasingly urgent task.[17] For Stiegler the cinema was the pre-eminent media form of the 20th century's consolidation and intensification of industrial modernization. In its rapidly achieved conventional stabilization by the late 1920s as commercial sound cinema it combined the potentials of the photographic and phonographic analog recording technologies in a mnemotechnical form of unprecedented power and reach. I will examine Stiegler's analysis of this power of the cinematic "experience" below. The digital audiovisual media draw on this power in various post-cinematic manifestations and consequently it is crucial for Stiegler's critical account of the nature and stakes of the digital transition to analyze the specificity of the cinematic form.

Citing Marc Azéma's *La préhistoire du cinéma*, Stiegler states that the extraordinary Chauvet cave art is in a way "the origin of cinema, insofar as it brought with it the discretization and proto-reproduction of movement, of which that cinema that appeared in industrial form in 1895 would be the mechanical culmination."[18] On the cave's walls were inscribed forms exteriorizing the psychic processing of experience, images produced from the imagination's reworking of perceptions recalled by the "desiring and dreaming beings that we are."[19] These images adopted and transformed the exteriorized forms that, as mnemotechnical cultural artifacts, had already conditioned those perceptions and the psychic mechanisms producing and integrating them. This is why Stiegler will propose at the outset of "An Organology of Dreams" that "the dream is the primordial form of this archi-cinema, and this is why an organization of dreams is possible."[20] As an expression of a desire (Freud), the dream is for Stiegler always also a negotiation of the psychic process with the collective cultural conditions of its identity and individuation, conditions experienced in and through exterior mne-

motechnics. Dreams are "organized" in part through the agency of the culture's *organons*, through which they are concretized as "transductive" forms mediating the reciprocal dynamics of individual and collective identity. Stiegler's "organological analysis" of human (as) becoming insists on the essential part played by an "organo-genesis in which consists the transformation of psychic and social organizations that result from the transformation of technical and technological organs."[21] Constituted in an irreducible relation of inside and outside, experience is in the epoch of grammatization an "archi-cinematic" montage and projection both of what individuals perceive and accumulate in living their lives *and* what is shared through cultural artifacts.

Stiegler approaches cinema, then, from this perspective. Cinema was the last century's most significant concretization of an industrialized mnemotechnical "organo-genesis" affecting the human capacity to dream (to desire) on an unprecedented scale. In *Technics and Time 3* its specific articulation of interior with exterior is assessed by drawing on the resources of Husserl's classic phenomenological account of consciousness. Stiegler considers the implications of the predominant industrial mobilization of film's power to wed the flow of consciousness to its unrolling in a process that concretizes in a particular way the archi-cinematic dynamics of the "beings in time" that we are. It is to this analysis that I now turn.

The Cinematic Industrial Temporal Object

Stiegler's account of cinema as "industrial temporal object" draws on and revises Edmund Husserl's phenomenology of the temporal object of consciousness. It is essential to understand Stiegler's post-phenomenological supplementing of Husserl's analysis of experience to grasp the implications and stakes of his analysis (and indeed diagnosis) of industrial audiovisual culture. Stiegler' cultural politics turns on his insistence on the importance of the co-constitutive dynamic between psyche and exteriority analyzed in the previous section. Cinema is important because of the transformative effect it had via its conjugation of the interiority of mind, desire, perception, memory and anticipation (or "protention" in Husserl's terms) with "the movies" as industrial product, economic commodity, cultural institution and political and promotional *organon*. Stiegler's account of cinema, then, is an account of the cinema as mnemotechnical *organon* connecting and configuring interiority and exteriority. Husserl's analysis of the phenomenology of the "internal consciousness of time" is significant in Stiegler's view for having provided the means to discern how the flow of the present moments of perception are combined together in such a way as to form coherent temporal phenomena. These are available for recall and reflection in the ongoing synthesizing dynamic through which consciousness develops and reformulates its criteria for evaluating phenomenality. Husserl distinguishes between two kinds of

"retention" operating in consciousness, the first enabling the second. "Primary retention" is what strings together the separate moments of perception into an extended present capable of constituting a coherent "temporal object" or phenomenon. It retains the impressional contents of past moments in the perception of a phenomenon such as a melody (Husserl's primary example) or a film which has become an object of conscious attention, retaining these long enough for the temporal object to be constituted as a single phenomenon.[22] "Secondary retention" on the other hand is the faculty of recollection as it is normally understood whereby such phenomena can be remembered and re-processed, reviewed and reflected upon by the imagination in the ongoing becoming of an individual consciousness's development. Stiegler supplements these with a third, exterior form of retention that he argues conditions the operations of the first two and, furthermore, demonstrates their composition in consciousness in contrast to Husserl's assertion of their opposition. "Tertiary retention," available to consciousness in the form of technical and mnemotechnical artifactuality, is the substrate of the interior retentional processes of consciousness and conditions its experience of and in time.

By adding this retentional "supplement," Stiegler both adopts and refigures Husserl's analysis of the workings of primary and secondary retention. This is why his account of cinema (and, indeed, consciousness) as developments in a far longer history of "archi-cinematic" mnemotechnicity is decisively "post-phenomenological."[23] Having posed insightfully the nature of experience as comprised of different retentional modes of perception and recollection, and of experience fashioned in the "living present" of consciousness and feeding the continuous revision of its underlying synthesis, Husserl was unable in Stiegler's view to develop the full implications of his account.[24] Limited by his efforts to ground phenomenology in a rigorous conceptualization of the phenomenon as separate and free from the subjective colorings of any particular perceiving consciousness, Husserl maintained an absolute distinction between primary and secondary retention. Perception was not influenced by the imagination, by what consciousness had already perceived and remembered. Primary retention formed temporal objects that passed into consciousness's store of experiences, but a semi-permeable membrane prevented the revisions and remembering of past experience influencing the living present in its ongoing constitution of phenomena. These were constituted on the basis of the general "eidetic" conditions of the deep structure of the manifestation of phenomena to intentional consciousness, the discovery and interpretation of which was the purview and goal of phenomenological inquiry.[25]

For Stiegler perception and imagination and their primary and secondary retentional processes are certainly different, but they cannot be opposed to each other. This becomes evident as the relationship between retention and *protention* in both kinds of retention is considered. For Husserl, the flow of time is phe-

nomenally experienced in a Janus-faced present that retains the preceding moments and anticipates the next on the basis of the preceding. In the hearing of a melody each new note sounds as the continuation of the sequence begun by the first note and retained in the elaboration of the "large now" of primary retention. As continuation of the melody, each new note is heard on the basis of its fulfillment of or divergence from what was anticipated of it. This anticipation is the protentional horizon that is the structural, eidetic complement of retention in the internal consciousness of time.

Primary retention modifies the present now by reducing it in some way as it passes into the "just-past," and this modification is itself continuous. Its reduction of the presently heard note enables that sound to both make way so that the new note can become present – a reduction that enables it to pass – and to be retained as part of that ensuing present (reduction to the just-past). This passing away to be retained as just-past is a dynamic process, however, and the protentional horizon of primary retention is key to this dynamism.[26] What is retained in each new note of the melody, or in each new shot of a film, is the modified previous note or shot. This just-past carries forth and undergoes a further modification of what it had retained of the note or shot before it, on the basis of the changing protentional projections of what the ensuing note or shot would be in response to what it turned out to be, and so on into the past of the retained just-past moments in the continuously modifying "comet trail" of the temporal object.[27] Retention, as inherently protentional, is a dynamic in which "each later retention is not only continual modification that has arisen from primary impression [the first moment of the temporal object], each is also continual modification of all earlier continuous modifications of that same initial point."[28]

Continual modification of continuous modifications – here, Stiegler argues, Husserl approaches the true complexity of primary retention as a spiraling dynamic out of which perception forms phenomena in time. The present now modifies what is retained of the just past "on the fly" (as one says today), but this occurs as a function of the protentions which have anticipated it. A note sounds that causes a refiguring of the pattern of the melody, or the sense of its mood, as it unfolds. A shot shows us something that causes us to re-evaluate *in an instant* what has been happening in the film's narrative or sequence of images and sounds, or how we are to understand a character or a montage of images. Past and present are in a relationship of folded, iterative co-constitutivity, mediated by the protentional projections of retention toward an anticipated future that the present realizes differentially.[29]

How then, could the temporal object start with a pure, "primary impression" unaffected by the protentional horizon of consciousness as ongoing, memorious continuity? Inasmuch as retention is always protentional, the *secondary* retention which enables consciousness to develop on the basis of its processing of experience cannot be definitively excluded, as Husserl would have it, from perception's

constitution of phenomena. This is in a nutshell Stiegler's critique of Husserl's account of internal time consciousness. Secondary retention has always conditioned primary retention from before it begins, and the spiraling flow of consciousness of a temporal object takes its place within a larger "vortex" of memorious consciousness.[30] Moreover – and this explains Stiegler's supplementing of Husserl's retentional modes – this is itself a spiraling within the cultural, collective vortex of tertiary retentions and protentions. The melody can only begin with a "primary impression" if it is recognized as music, based on the protentions of a consciousness that has heard music before and can distinguish it from other sounds.[31] What is and is not music is a question that must be posed in cultural and historical terms.[32]

"The ear is originarily musical," says Stiegler in summarizing his response to Husserl in *Technics and Time 2*.[33] And *Technics and Time 3's* account of cinema and "cinematic consciousness" could be similarly resumed as "the eye is originarily cinematic" – although it would be more apt to say the eye and the ear inasmuch as the synchronized sound film of standard commercial cinema is an *audiovisual* temporal object. The "unprecedented" power of the cinematic mnemotechnics resides, for Stiegler in its capacity to produce a compelling experience fashioned in what he variously characterizes as a conjoining or coinciding of the temporal flows of artifact and perceiver.[34] The cinematic flux generated by the projecting apparatus for "re-temporalizing" the industrially produced recordings captured on film (and later on tape, floppy, optical disk and so forth) entrains the primary retentional process of perceiving consciousness. Or, rather, entrains the flow of many consciousnesses: cinema realized an unprecedented power to captivate mass and globally extended audiences on an unprecedented industrial scale of production, distribution and exhibition. Like Jonathan Beller, in the wake of the *Kulturkritik* of Horkheimer and Adorno, and after the ideological apparatus theory of Althusserian-influenced film studies – both of which his work represents a critical response to – Stiegler emphasizes the centrality of "Hollywood" to the spread and intensification of global industrial capitalism in the 20th century.[35]

The eye and the ear are "originarily cinematic," that is, "archi-cinematic," which means technically, technoculturally enabled. Through his post-phenomenology Stiegler is able to identify how cinema could map itself to the temporal flow of consciousness like a musical (or theatrical) performance but also be industrially produced and reproducible. Its montage of shots fabricate the unrolling of its projected flow and condition expectations of what temporal object it will become – and all this as subject to industrial design, specification, and standardization.[36] The archi-cinema of consciousness reaches a new stage of its mnemotechnical, organological "evolution." In the globalizing, American century, archi-cinema becomes a cinematic montage and projection of perception and memories that are both individual and retained from the experiences of others that remain active thanks to the mnemotechnical *organon*. Hollywood be-

comes the "capital" of 20th century consumerism through its capacity to standardize and globally distribute dreams, fantasies and desires.[37] Stiegler says that a "film is a kind of dream had in common, a daytime dream, via the industrial production of tertiary retentions which are themselves industrial."[38] It functions, as Godard says of Hollywood (citing André Bazin in *Contempt*, but in error), like the realization of a "world that conforms to our desires."[39]

Cinema's capacity to compel conviction is identified by Stiegler as the power to fabricate a convincing mnemotechnical fictioning of reality, a reality which is never phenomenally "pure" and which is always mediated by tertiary memory supports. Film presented the possibility of the photographic and mechanical capture of the spatial and temporal dimensions of exterior appearance. This is undoubtedly central to its early success and its rapid expansion into a major industrial media form in the early 20th century. Stiegler characterizes the specificity of cinematic technics as emerging from the conjunction of their spatial and temporal recording and playback systems. The cinema's extraordinary power emerges as the quickly understood expectation that it is able to generate two "co-incidences":

> 1. The photographic coincidence of past reality, of past and reality. This is the "real effect" of the capture of a past space-time in front of the photographic apparatus identified by Roland Barthes in *Camera Lucida* and André Bazin before him in "The Ontology of the Photographic Image."[40] In a similar vein, accounts of the indexicality of the cinematographic sign have stressed this sense of the capture by the camera of what was there before it at the moment of exposure. This temporal dimension of photographic capture is the decisive feature of what analog cinema "essentially" *was* for D.N. Rodowick; less a representational record of an actual space than a recording of a past time, gone forever but preserved by and in the apparatus.[41]
> 2. The coincidence of the "flux" of the film's unrolling in time with the flux of the spectator's consciousness. This is the result of the mechanical production of the illusion of movement from the capture of still images, a process of recording duration comparable in effect, if not in procedure, to the phonogram's recording of sound – itself later to be wedded to the cinematographic through synchronized "sound-on-film" technology in the re-tooling of mainstream cinema in the late 1920s.

The cinema produces a compelling "illusion" of reality that unfolds in the lived time of the spectator's conscious attention before it. The spectator lives the cinema's fictioning of experience. Lived experience is co-generated in the composed fluxes of the film and its viewing. Stiegler's focus on this composition of experience and fiction, of the fictioning of experience in the cinema, re-frames some thorny issues concerning the realism of film (and indeed of the post-cinematic

forms noted above). In the classic accounts of the ideological effect of the cinematic apparatus and of its illusionistic realism, for example, the claims for the effect of the cinema on the psyche of the spectator turned on an uneasy relation between, on the one hand, an account of the imaginary mastery generated by the "apparatus" of the cinema in its placing of the spectator as the invisible focal point of an orchestrated sequence of views and, on the other hand, a conventionally established narrative realism of character, plots, and verisimilar representational norms.[42] From this perspective, a phenomenological account of cinematic experience was hopelessly naïve, or cynically complicit with the ideological workings of the dominant social order dedicated to reproducing itself. The spectator could only be rehabilitated by a theoretical and/or aesthetic destruction of the double trap of apparatus and its false projections, much like the slave in Plato's cave who had to be freed and made to exit the cave of shadowy projections. His or her life down there in the cinematic illusion was false, a kind of mental trap made of artificial copies of true existence positioned cleverly vis-à-vis the duped.[43]

From Stiegler's perspective, however, access to a space of unmediated, illusion-free experience is the illusion; all experience is mediated, that is, fabricated, and passes into, through and from techniques and technics. Cinematic representation has been more or less globally adopted as a compelling experiential medium. Its extraordinary global success in the last century represents a major shift in the mode of fictioning experience from what was for two millennia a predominantly literary and graphic (as distinct from photographic) technoculture. Its "apparatus" demands careful analysis as a powerful means of fictioning experience, but it is not a secret system for locking the human psychic apparatus into an illusory experience of reality, just as the commercial "culture industry" more generally does not possess – counter to what Horkheimer and Adorno proposed – a decryption key for all the Kantian schemas operative in the syntheses of human imagination, memory and experience.[44]

So while it is important, indeed vital, to pay attention to what is fictioned in mainstream cinema for its capacity to influence understandings, values, and in general people's orientations to living, it is also critical to keep in view the fact that all experience is composed with and through kinds of fiction. This is why cinema is so powerful; it animates fictioning in a new and compelling way through its enrolling of the spectator in its unrolling. This is both its potential and its threat, continued and in some ways multiplied in the wedding of this capacity to other technics in the emerging digital industrial temporal objects.

Cinema edits experience and this is at the center of what Stiegler will call its "pharmacological" character as both poison and cultural cure or therapeutics. In the capitalist industrial era Hollywood has served the reifying purposes Horkheimer and Adorno identified, "synchronizing" consciousnesses on a massive scale in order to coordinate consumption with the needs of the industrial system in

general by providing means to condition the experiences that become the secondary retentions – and consequently, the protentional horizons – of the many.[45] But cinema and its maturing digital mnemotechnical descendants also hold in potential "positive pharmacological possibilities" via their amazing capacity to thread together consciousnesses in collective experience.[46] Indeed, as is widely recognized, the digital transition represents the potential for an equally unprecedented, global empowerment of citizens as media producers with the potential to completely overturn the predominant model of the concentration of mnemotechnical production in corporate interests.

This is why Stiegler argues for the need to "make movies" and to "get behind the camera."[47] Developing what one calls a "working knowledge" of the production of experience is a central critical task today, inasmuch as it is a prerequisite to realizing the potential of the digital transition's remodeling of established broadcast media production and reception regimes.[48] It is not only that getting "behind the camera" represents an effective way to unmask the synchronizing techniques of mainstream cinema (and the industrial experiential media that have succeeded it) – a rationale which best characterizes the project of the "political modernist" experimental film maker/theorists of the 1960s and 1970s.[49] Drawing inspiration from Abbas Kiarostami's enigmatic CLOSE UP (1990) and its significance for the film-loving Iranian society in and for which it was made, in "Faire du cinéma" Stiegler appeals to the critical value and necessity of working with as well as on – and not against – the technics for fabricating such compelling experiences. This is the pathway to a better understanding of the nature and necessity of "our" grammatized cinematic consciousness. It is in this way that a better adoption of post-cinema's systemic, industrial mediation of experience can be opened up in and as a way to dream up a credible future. If as I said earlier grammatization marked another decisive emergence in the becoming of human "technical life," I would conclude by pointing out that for Stiegler there is nothing inevitable about the course of this becoming, nothing that guarantees that this technical life will continue to answer to the characterization of "human." On the contrary; it is increasingly apparent today that the interminable historical project of realizing a human being must be actively negotiated and pursued through a critical and cultural political inflection of technoscientific developments that share no essential biological determinations or tendential vectors with such a projection of the human. This makes the adoption of each shift of mnemotechnical forms an increasingly urgent political question about the course of the overdetermined but nonetheless open history of human becoming. "Archi-cinema" – which today is on the threshold of an epoch that might motivate a renaming of our mnemotechnicity to something like "archi-programming" or "archi-simulation" – has to be continually remade so as to continue as a *human* history.

What Are Media?

Lambert Wiesing

When we look at the current state of media studies, we might well think that it may be better not to ask the question *What are media?* but rather *What isn't a medium?* Indeed the situation seems to be such that media studies is determined by a rather large number of concepts of media that are, however, equally wide, in part even unlimited. Media studies, that is, is determined by concepts of media that to a worrisome degree have moved away from the everyday understanding of the medium as a means of communication. This diagnosis is by no means restricted to an isolated current. On the contrary, the inflationary employment of the concept "media," remarkably, can be observed in media theories that understand themselves as competing positions. The technically oriented approach of Marshall McLuhan can document as well as the system-theoretical approach of Niklas Luhmann and the concept of media in phenomenological theories how work is done – if not in the same way, then to the same extent – with an underdetermined concept of media. Just a short look at the main theses of these approaches can show this.

In McLuhan's work media – like all other "technics" – have the status of a means. Media are tools that improve human action and cognition. Just as the hammer is an artificial improvement and expansion of the human body, the McLuhan tradition holds, other media are as well. While mechanical technics relocate the bodily functions of the human being to the exterior, electronic media exterritorialize the central nervous system and the sense organs. Media simulate or amplify, implement or replace bodily and organic capacities. This understanding of media leads McLuhan – and his many followers – to count not only every tool but even every form of energy as part of the meaning of the concept "media." We may sharpen McLuhan's concept of media in the following formulation: the concepts "medium" and "tool" are synonymous.

Niklas Luhmann's system-theoretical concept of media, in particular, deliberately presents itself as an alternative to this technically oriented approach. Luhmann, following Fritz Heider, determines the medium as a possibility for real forms. Media are an open plurality of possible connections. This means that Luhmann and his followers use the concept "medium" with the meaning "opportunity for existence," "disposition," or simply "possibility." Every undetermined possibility that allows for the manifestation of determined forms is a me-

dium. The medium is the opportunity to convert a form into something. That is, completely different from McLuhan's conception, a medium for Luhmann does not itself do anything and is therefore not a part of any message either. Media themselves cannot be present and graspable at all, for they are always only a possibility determinable by concrete forms. We may sharpen Luhmann's concept of media in the following formulation: the concepts "medium" and "possibility" become synonymous, and the extension of the concept of media is correspondingly wide; art, society, and the human capacity for perception are all media.

Phenomenological media theories present themselves as yet another alternative – this time both to the technologically oriented and to the system-theoretical approach. This can be observed particularly clearly in Boris Groys's *Unter Verdacht: Eine Phänomenologie der Medien* [Under Suspicion: A Phenomenology of Media].[1] What is particular about phenomenological media theories is that they define media exclusively via their presence with the user of media. For all the differences between phenomenological media theories, one observation is always the focus of interest – the transparency of media or the self-denial of the medium. A medium, accordingly, is a means that functions only when it steps back. To fulfill their function, media must remain unthematized. Put differently, media display something without displaying themselves. In this respect they are comparable to a transparent windowpane that allows for a look without itself being seen and through which we only look as long as we do not pay attention to it. Media, from this point of view, do all the more justice to their task the more they neutralize themselves in their employment as media. A well-known description of this medial transparency in Maurice Merleau-Ponty goes as follows:

> Now, one of the effects of language is to efface itself to the extent that its expression comes across. [...] When someone – an author or a friend – succeeds in expressing himself, the signs are immediately forgotten; all that remains is the meaning. The perfection of languages lies in its capacity to pass unnoticed.
>
> *But therein lies the virtue of language*: it is language which propels us toward the things its signifies. In the way it works, language hides itself from us. Its triumph is to efface itself.[2]

The consequence of this phenomenological approach is clear. All means that remain unthematized during their employment are addressed as media. Accordingly, signs are media the same way every tool is. Not only is every glove a medium; even one's own body [*Körper*] is explicitly described by Merleau-Ponty as a medium, since it is invisible in the course of perception and action.[3] We have to go even further: there is much to suggest that in the phenomenological tradition the body [*Leib*] is not just an example of a medium but the silent archetype of all

media. This, at least, is the conclusion reached by Christian Bernes: "The Body is the Paradigm of Mediality" [*Der Leib ist das Paradigma der Medialität*].[4]

To sum up: Even a short look at prominent positions within contemporary media theory shows that the concept of media in each case can hardly be said to correspond to the experience of media, if not in the same way then to the same extent. In all three theoretical approaches the concept of media retains only the most distant connection to the prominent everyday understanding of media as a means of communication. Media theories analyze their own "home-made media," for the phenomena analyzed as media have been identified as such only by the respective theories. We are dealing with media theories of things that without these theories would not be media, such as energy, perception, or the body. In all three cases the concept loses significantly in intension and gains alarmingly in extension.

This progressive de-limitation of the concept of media has by no means gone unnoticed. On the contrary, we might get the impression that in this respect there is a kind of reversal in media studies, especially in the last few years. At least we can observe that the number of critics of concepts of media that are too wide is on the rise. Exemplary of this trend is Matthias Vogel, with his widely noticed study *Medien der Vernunft* [Media of Reason], in which he emphatically warns that in the pre-eminent media theories, which "are more prone to damaging the reputation of the concept of media in the long run," the "highest point in the process of dedifferentiation" is attained, the point, that is, at which "the concept of media is threatened by substantial erosion."[5]

Georg Christoph Tholen is even more radical in his study *Die Zäsur der Medien* [The Caesura of Media]. He does not even regard the media theories presented above as theoretical contributions but merely cites them as historical examples for the "de-limitation of the figural and authentic meaning" of the concept of media. The classics of media theory, for Tholen, come with a "sprawling metaphorics in the[ir] conceptual attempts at determining the mediality of media."[6]

In short, what is missing are the differences that make a difference. If with McLuhan every tool, with Luhmann every possibility, and with the phenomenologists every transparency is addressed as medium, there must arise a call for the determination of criteria with which it becomes possible to distinguish the screwdriver from the television set, art from the telephone, and a windowpane from a book. That is why Matthias Vogel is correct in his demands: "An alternative to the turn away from the looming equivocation of media and tools and the devaluation of the concept of media can only come into view if we distinguish the goals to whose actualization media contribute from those that can be achieved with the aid of tools or their means."[7] This, precisely, seems to be the challenge of a media theory that works systematically: the search for a *differentia specifica* to keep the concept of media from deteriorating into a mere synonym of other concepts. Remarkably, the labor on this question is relevant beyond the concrete

problem itself. For as long as media theories work with concepts of media according to which almost anything can be described as a medium, they will be regarded by other disciplines as worrisome academic jacks of all trades, which surely is not conducive to the process of its institutionalization in the academy. If this danger is to be continued by a fruitful perspective, there is no way around advocating a concept of media that has more sense and less meaning, more intention and less extension. And this, precisely, can only be achieved by strictly ensuring that necessary characteristics of media are not treated as sufficient ones.

When we stand on the floor wearing socks and shoes, we usually do not sense our socks and shoes but the floor. We perceive mediately whether we stand or walk on carpet, grass, or concrete. The shoes and socks are not perfectly nonpresent, for it is very well possible to distinguish whether we walk barefoot or in shoes. But this belongs to transparency: it always includes opacity as well. What is decisive, exclusively, is that the shoes and the socks are not themselves thematized but that they let the ground below and its properties such as bumps be perceived. And now the crucial question poses itself: how do the socks fare with the media theorist? Only two possible answers are conceivable.

First, the socks and shoes, too, are accepted as media, for after all it is by means of them that a thing that is not directly touched is perceived; they are a transparent extension of the body. Formally speaking, the argument is that transparency is a sufficient phenomenological property of media, which is why all transparent means, that is all tools that are not thematized in their employment, are media.

Second, shoes and socks do indeed have a phenomenal property that media have as well, but this property is not sufficient for media, only necessary. The definition of media via transparency raises a necessary property to the level of a sufficient property. Yet the sufficient property is a completely different one. The same argument can be used for McLuhan and Luhmann. Media are tools but not every tool is a medium, or media offers possibilities but not every possibility is a medium.

If we follow this second path we are concerned with the search for a *differentia specifica*, a sufficient criterion by means of which media can be distinguished from other phenomena that have the same necessary properties. What is remarkable is that what offers itself for this delimitation by means of a sufficient characteristic is a distinction that belongs to the great classical ideas of Husserl's phenomenology. The suggestion is that media are those tools that make it possible to separate genesis from validity. Media, accordingly, are tools or means that are transparent during their employment; but they are also specific tools that are capable of something that other tools cannot achieve, namely a separation of genesis and validity. This suggestion of a definition takes recourse to a genuinely phenomenological idea, albeit an idea that until now has hardly been noticed in

phenomenological media theory. This is not surprising insofar as the distinction of genesis and validity was developed by Edmund Husserl at the end of the 19th century without any reference whatsoever to media theoretical questions. The separation of genesis and validity that Husserl develops in the first volume of his *Logische Untersuchungen* [Logical Investigations] of 1900, following to a large extent similar reflections by Gottlob Frege, is seen as the central argument against psychologism and historism.

Humans are capable of producing something that has no physical properties by means of techniques of production that can be described physically – this is the claim of the separation of genesis and validity. The concept of genesis is used generally for all physical processes. Every process of production or emergence is – in somewhat emphatic terminology, to be sure – addressed as "genesis." Put tautologically, this means that genesis is the genetic process that generates something. These processes take place in space and time; they are empirical facts and can accordingly be studied with the means of different empirical sciences. Thus, for example, it can always be determined when such a process of emergence begins and when it ends, where it takes place and under which conditions it unfolds. An empirical process is always a process that can be changed and also be destroyed, that is to say aborted – and this is not the case for validities. We can speak of a validity when something seems to exist that has no physical properties. Indeed, it is easiest to determine validity negatively, by saying what it is not: it is something that is not physically graspable yet to which humans can nonetheless refer. We sense this nonphysicality of validities in particular when we take notice of time. If something is unchangeable and does not become older, then it cannot be an empirical thing. What is in the world also ages with the world. In considering time, Husserl describes the decisive difference between empirical processes and validities. Validities are "untouched by the contingency, temporality and transience of our mental acts."[8] His example is a mathematical calculation. If we take the proposition 2 x 2 = 4, then we have on the one hand an empirical speech, a materialized process in space and time, a physically describable phenomenon. Yet on the other hand we also have the validity of this proposition, which is not dependent on who formulates this proposition when and how: "Acts of counting arise and pass away and cannot be meaningfully mentioned in the same breath as numbers."[9] What Husserl means is a difference that is as simple as it is important: if the proposition 2 x 2 = 4 is printed in a book, this material sentence will age, yellow; it can be erased, or the book can be destroyed. But what is meant by the proposition is not touched by these changes in time; the content of the proposition does not grow older, which is why Husserl writes, "In this sphere there can be no talk of individual facts. Of what is temporally definite."[10] Hence a property is present that cannot be thought physically: everything that has a physical existence must grow older. Yet validities are removed from the ravages of time because they are not physically existent. What

is not in time cannot be changed by physical force. Husserl writes, therefore, "My act of judging that 2 x 2 = 4 is no doubt causally determined, but this is not true of the truth 2 x 2 = 4."[11]

Husserl's example has one great disadvantage: it suggests that truth and validity are identical. Yet this precisely is not the case. What this is about is just that different people at different times can mean the same thing by the proposition 2 x 2 = 4. Validity is a precondition equally for truth and for falsity. For even someone who wants to claim that the proposition 2 x 2 = 4 is by no means always true finds him- or herself in opposition to whoever thinks, like Husserl, that the proposition 2 x 2 = 4 is always true only if both mean the same thing by their different propositions and thus are of a different opinion about the same thing. Only if we are of different opinions about the same thing are we of different opinions – and this, precisely, is what validity is: the existence of something that is the same for several people at different times.

In light of the classic distinction of genesis and validity the question imposes itself: how is this possible? How can something that does not have any physical properties be generated with physical tools? The question seems unanswerable because in the end it asks how thinking and rationality are possible. Yet even if we cannot explain how something is possible, we can sometimes describe what is necessary for it, in this case: media. Media are necessary for the separation of genesis and validity – other tools are incapable of this, which is why the following definition imposes itself: media are precisely those tools with which this separation can miraculously be accomplished and which constitute at the same time the mediation between both moments. "Separation" here does not mean that one could, so to speak, really isolate validity and cut it off from the hardware and put it aside like a thing. "Separation" means that media always consist of a genesis aspect and a validity aspect and that this conceptual distinction is necessary and possible in their case alone. Husserl's example already shows this: only somebody who employs a conceptual language as a medium is capable of thinking by means of the proposition 2 x 2 = 4 something that can also be thought by other people at other times by means of this medium. Human beings can think things and relations that do not grow older, that cannot be influenced by physical processes, only with the help of the medium language. In short, only by means of media can different human beings at different times think and mean not only something equivalent but also the very same thing [*nicht nur das gleiche, sondern dasselbe*].[12] We may even determine the somewhat antiquated concept "validity" as follows: validity is artificial self-sameness [*Selbigkeit*] and media are the means for the production of artificial self-sameness.

In many books, in many locations, the self-same novel can be read – it is precisely this self-same novel that affects so many people so differently, that is at different times interpreted and understood so differently. Hardly anyone would seriously want to claim that only those have read the same novel who really held

the self-same copy in their hands. Everybody who has read Thomas Mann's *The Magic Mountain* has not read a merely equivalent, but the very same novel. Husserl writes about his example, the proposition 2 x 2 = 4, that this judgment "is the same whoever passes it."[13] Following this formulation we could say that the novel *The Magic Mountain* is always the very same novel, no matter who prints it. The movie THE MATRIX is always the very same movie, no matter when and where it is watched. A home page is always the very same home page, no matter with which computer and on what screen it may be generated. In this way the fundamental capacity of media becomes determinable: media allow for the production, in different places and at different times, not only of an equivalent but also of the very same thing. And because everybody can at different times and in different places read the very same novel, make the very same judgment, and see the very same image, it can no longer be said that what, thanks to media, comes about as validity is a private affair. Medial validity exists only in the communal form: "The number five is not my own."[14] Of course there are private psychological acts of thinking with which someone at a specific moment thinks the number five but because of the employment of a medium – namely conceptual language – the very same thing that this person thinks in this moment can also be thought by another person at another moment. There is of course the private copy of Mann's *The Magic Mountain*, that is, the unique kind of genesis of the novel that sits on a bookshelf in someone's home. Yet the content of the book can no more be private property then the number five – for the content does not exist as a physical something but as a validity. The parallel to Husserl, therefore, is the following: just as writing is a medium by means of which many people can read the very same novel, so language is a medium by means of which many people can think the very same number.

These reflections show us what is meant by such widespread concepts as "storage media" and "distribution media." If media as a whole are the means by which human beings can perceive and think something that has no physical properties, then this validity is stored in storage media and distributed in distribution media. It is quite inapt to call every means of storage and every means of transportation a medium. Storage media, to be more precise, are media for the storage of validities, and distribution media are media for the distribution of validities, for the simple reason that what a storage medium stores is something special: something that does not grow older. The grain of wheat that is stored in a granary is subject to the laws of physics. No refrigerator, no matter how good, will ever be a storage medium because no matter how well it preserves the food stored within, it will not suspend the laws of physics. That is why storage media are not optimized refrigerators. A symphony that is stored in a score or on a CD no longer changes. In this sense distribution media do not allow for the distribution of just anything but for the distribution of self-sameness. Many people in many places can nonetheless see the very same TV program. No transport com-

pany has this capacity. The very same thing can be present in different places and at different times only through media.

It seems to be a genuinely phenomenological concern to pursue the idea that media produce and allow for something whose specific qualities can be described; media can be recognized by the phenomenological properties of their products. The particularity of this approach becomes clear when we compare it to the definition proposed by Lorenz Engell and Joseph Vogl in the preface to their ambitious collection *Kursbuch Medienkultur: Die massgeblichen Theorien von Brecht bis Baudrillard* [A Guide to Media Culture: The Authoritative Theories from Brecht to Baudrillard], which reads: "Media make legible, audible, visible, perceivable, yet all of this with the tendency to erase themselves and their constructive participation in these sensibilities and thus to become as if imperceptible, anaesthetic."[15] To be sure, hardly anyone would want to contradict the claim that media make legible, audible, and visible. Yet when we reduce media to this capacity, we implicitly claim that what is made legible, audible, or visible by media is not distinct from what is legible, audible, or visible without media. The use of media, so to speak, would have no effect on what is made visible with them. Yet it is here, precisely, that a phenomenological description can pick up: what is made visible by media is of a fundamentally different kind than what is visible without a medium. We can tell that what was made visible by a medium was made visible that way: media make visible, audible, legible something that does not exist physically. That is why we are not dealing with a medial process when something physically existing is made visible. When the light is turned on in the basement, it makes the things stored there visible – but the light is not a medium; it only lets things become visible that behave according to the laws of physics. The same is true for mirrors. In the case of media it is exactly the other way around: they exclusively make things visible that would not be capable of being visible without media because they are nonphysical things. This does not in the least mean that media are remarkable and relevant only with respect to this specific capacity of theirs. On the contrary, very often it would be a distorting reduction to concentrate, in medial processes, only on the validity and not on the materiality of the medium employed. In quite a few aesthetic contexts it even is the materiality of the media employed that is of pre-eminent significance. Nonetheless, no material property explains why something is a medium. Only certain materials and technologies are addressed as media, namely those with which self-sameness can be produced. This difference can be depicted particularly well in the case of images.

The visibility of the image is, medially conditioned, a kind of visibility that is fundamentally different from that of a real thing. For the image object visible on an image carrier is distinct both from the material that makes visible and, as the case may be, from the denotatum symbolized by the image object. The image object is visible, but it has properties that a real visible thing cannot have, which

is why we hardly confuse an image object with a real thing: it does not grow older; it cannot have light shed on it; it cannot move; it cannot trigger any physical effects; and it cannot be looked at from the side. That is why two moviegoers, even though one may be sitting all the way to the left and the other all the way to the right in the movie theater, still see the very same film, even if they do not look at the screen from the same direction. (This, by the way, is not true for theater; there, it may very well be the case that not everything on the stage can be seen from every place in the audience.) What is seen in an image are autonomous things that are perfectly taken out of physical reality, things that are not part of the world. It is as if Hans Jonas wanted to hint at the characteristics of validity when he writes in his essay "Homo pictor and the Differentia of Man" that the world visible in the image is "removed from the causal commerce of things."[16] In short, the image object has no physical existence but is nothing other than the visible validity of an image. This certainly surprising consequence indeed seems inevitable. What Husserl calls image object is only a form of appearance of visible validity specific to the medium of the image. This interpretation and, in particular, the formulation "visible validity" seem unusual only as long as the problematic of validity is discussed in reference to problems of mathematics and proportional truth alone. Yet in Husserl himself we do not find this limitation. In a small, somewhat hidden short remark that he makes in a supplement to the fifth of the *Logical Investigations* he explicitly clarifies that image objects are perceived validities: "The painting is only an image for an image-constituting consciousness, that is a consciousness that by means of its imaginative apperception endows a primary object that appears to it perceptually with the 'validity' or 'meaning' of an image in the first place."[17] This makes it clear that validity in the case of the image is an object that is perceived and that is no longer subject to the laws of physics, and that media are the tools that must be employed for the separation of genesis and validity. Media make legible, audible, and visible – but something special becomes legible, audible, and visible through them; namely intersubjective self-sameness, that is, validity. That is why we can say that media are precisely those tools that make it possible that not just something *equivalent* but also the *very same thing* can be seen, heard, and thought at different times, in different places, by different people – and this likely is the reason why media can hardly be overestimated in their anthropological significance.

If humans had no media, they would be a mere piece of the world – like jellyfish, they would stand in a relation of identity to their environment, if in that case we can even speak of environment. Humans are part of the world – but precisely not just that, since by means of media they participate in realities that do not behave like the world of physical things. If humans had no media, they could only see what is present; they could only see what they could also hear, smell and touch. Only because there are media are humans capable of seeing, hearing and thinking the very same content at two different points in time. Nature does

not know of the self-same, only of the equivalent. The camera is a visibility isolation machine: it separates visibility from the present physical substance of a thing. Yet what is not physically there, like an image object, has no physics; it is fantastically nonphysical. That is why images can display matters of fact that are physically impossible. Precisely this, the ability to think and perceive physical impossibilities, is possible only with media; they are the only means humans have to disempower physics. That is why without media no human existence that is more than the presence of stuff can emerge. Because there are media, humans live not only in physical nature but also in a culture, and they therefore owe their human existence to the employment of media. Thus results a perspective for work on media that is as phenomenological as it is anthropological: media liberate humans from the ubiquitously present dictates of the physical world.

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Translated by Nils F. Schott

PART II

Cinema and Media Technologies: Hardware, Software, Wetware

The "History of Vision"-Debate Revisited

Annemone Ligensa

The Modernity Thesis

At least since Karl Marx, cultural critics have claimed that perception has a history, and, since media involve perception, critics of industrial modernity have applied and elaborated this idea in their theories of modern popular culture, which is why this tradition of thought is also known as the "modernity thesis."[1] The "first generation modernity theorists," as Ben Singer has usefully called them,[2] e.g., Georg Simmel and Walter Benjamin, claimed that the sensory overload of the modern metropolis changed man's sensorium profoundly, and that this in turn created the desire for modern forms of art and entertainment. Whereas some of the "second generation modernity theorists," such as Wolfgang Schivelbusch, have continued to draw upon these ideas, others, such as Jonathan Crary, conceive media as forms of perception and interpret these as well as historical theories of perception as reflections of capitalist ideology (i.e., they address the impact on the viewer less directly). Such theories are still influential today, but they have increasingly been challenged by scholars who, drawing upon cognitive and evolutionary psychology, argue that perception is biologically determined and hence largely unchanging. Early cinema has played a major role in this debate, because the modernity thesis attributes a special importance to vision,[3] because cinema is a typical example of a modern, commercial mass medium, and because the historical emergence of this medium marks a "turn" or even an "upheaval" in popular culture that is comparable to our current "digital revolution."[4] Hence the most prominent protagonists of the debate, such as Tom Gunning and David Bordwell, can be found in film studies.[5]

Noël Carroll and also Frank Kessler believe that this debate is mostly due to differences in the definition of "perception" (the content vs. the process of perception, sensory perception vs. apperception, etc.).[6] This may be true in part, but at least the "first-generation modernity theorists" really did make statements about physiological change. For example, Simmel claimed that the sensory acuity of modern man had decreased,[7] and that people had developed a protective organ to guard against the sensory overload of the modern metropolis.[8] Later,

Wolfgang Schivelbusch drew upon Walter Benjamin's appropriation of Sigmund Freud's concept of the "stimulus shield" as if it were entirely plausible.[9] The stimulus shield is a rather questionable notion, variously described as an inorganic region of the brain and as a psychic function of the ego. Psychoanalysts have usually preferred the latter description, because there is no empirical evidence for the former.[10] Perhaps not all of the "second-generation modernity theorists" take such physiological claims literally anymore, but if so, they have rarely said so explicitly. Hence media theories should be continually updated with psychological research, and this is a process that scholars who draw upon current psychology, such as Ben Singer, have begun.

However, even the way that media theories are formulated often makes such updating difficult, if not impossible. For example, Edward S. Reed has commented on Donald M. Lowe's book *History of Bourgeois Perception*:

> Lowe's discussion of the role played by cinema in changing people's perceiving is completely undercut by his muddling of the objects and processes of seeing. He is unsure whether camera and editing techniques actually produce an objective visual display of a certain sort, or are merely stages in the formation of subjective impressions. [...] Thus Lowe can make such an absurd claim as the camera eye is "mobile, unlike the human eye" (p. 130). It is one of the basic facts of primate seeing that it is an act of looking around, accomplished by a moving binocular system inside a mobile head above a mobile body. Lowe complains that still and motion photography have taught us to "see the world in fragmentation and dislocation" (p. 135). If anything, what we have learned is to see events portrayed in pictures and film despite the selective fragmentation of photographic and cinematographic technique. Like many students of visual art, Lowe consistently – but without explanation or justification – confuses the world that is seen with both the seer (and her subjective processes) and the medium allowing the indirect perception of the world.[11]

If the example of the "mobile eye" is relatively simple and hence easy to dismiss, there are many other tenets of the modernity thesis that are much more complex. The basic problem of approaches like Lowe's is that even though they make strong claims about the relevance and effects of media, they argue on such an abstract level that they practically eliminate the perceiving subject. Without a concept of viewers as real human beings (rather than spectators as "textual positions"), we cannot make a connection with psychology at all, because even though psychologists are also aware that their theories are only constructs, they are theories about human beings rather than cameras (which do not really perceive, but only record).[12]

A further consequence of this line of argument is that, as Carroll points out in the case of Jonathan Crary, there is a tendency toward taking contemporary theories of perception for the perception of contemporaries.[13] One might say that discourse analysis often takes the notion of ideology as "worldview" too literally. For example, in response to remarks by Paul Feyerabend about the historical significance of the telescope, Gernot Böhme insists that it has not only changed knowledge, but perception.[14] With this he does not just mean that the telescope has shown us more things than we are able to see without it, but that we do not see a "Man in the Moon" any longer. I must admit that I still see a shape that reminds me of a face, even though I know that it is formed by craters of rock and dust, and I suspect that I am not alone. As for anecdotal evidence, one might think of one of the most popular films of early cinema, Georges Méliès's LA VOYAGE DANS LA LUNE (1903), as well as the recent discovery of a "face" on Mars. The phenomenon of seeing objects in random visual patterns is known as pareidolia. A psychological explanation for this specific instance is that recognizing faces is important for us as a species, and the basic pattern is therefore imprinted in our brains at a very early age.[15] Knowledge does not override this perceptual impression – which, however, does not make the telescope and the "insights" that it has provided any less important. The "history of vision" thesis tends to overlook that knowledge and perception can often be at odds.

That said, perception, and especially the perception of historical individuals, is very difficult to study. Historical discourses predominantly represent the experiences of the cultural elite rather than those of ordinary people. Furthermore, much of what goes on in perception is subconscious and hence not articulable in the first place,[16] a fundamental epistemological problem that Zenon Pylyshyn has called the "cognitive impenetrability of perception."[17] Consequently, either we follow Ludwig Wittgenstein's dictum that, "Whereof one cannot speak, thereof one must be silent,"[18] or we argue on the basis of what is most plausible with the help of current psychological research. However, the range of aspects that one can study is potentially limitless, so I can only discuss a few examples here. Instead of structuring my discussion of the "history of vision"-debate according to its chronological development or the positions of individual theorists, I will present the central arguments according to the perceptual aspects of film viewing to which they relate.

The Perceptual Environment of Early Cinema: Overstimulation as the Modern Condition

The current consensus in the social sciences is that media effects, even those on cognition (e.g., opinions), are relatively small, mostly due to "selective exposure," i.e., people tend to select media and content in accord with their beliefs, tastes, skills and dispositions, and then process what they see and hear on the

basis of their established cognitive schemata (which only change if they are repeatedly confronted with highly contradictory information).[19] Furthermore, the media industry itself tends to be conservative: There is certainly interest in selling new products, but it is more economical to adapt them to audiences as they are rather than try to change them profoundly. Indications of this are the high failure rates of new products in the media industry as well as the tendency to turn to successful formulas again and again.[20] That is, if there is any deeper, perceptual change, it is neither likely to be quick nor brought about by media directly, but by culture at large. The "first generation modernity theorists" actually argued as much, but nevertheless, they tended to overestimate the effects that even culture as a whole has on perception (and they also judged them too negatively).

Simmel and many other cultural critics around 1900 claimed that the sensory overload of the modern metropolis induced people to seek out highly stimulating leisure activities (which is not unlike complaints today that people are perceptually overwhelmed by an environment of digital media). Several years later, Walter Benjamin still held a similar view, but perhaps one could say that he gave the argument a somewhat more sympathetic twist:

> The film is the art form that is in keeping with the increased threat to his life which modern man has to face. Man's need to expose himself to shock effects is his adjustment to the dangers threatening him. The film corresponds to profound changes in the apperceptive apparatus – changes that are experienced on an individual scale by the man in the street in big-city traffic, on a historical scale by every present-day citizen.[21]

In his discussion of this hypothesis, Singer employs the concept of "neuroplasticity."[22] However, in a wide sense, any learning involves neurological changes, whereas in a narrow sense, processes such as neurogenesis are limited (to critical phases, to certain brain areas and functions, etc.).[23] Hence, it is not that physiological change is not possible at all, but drawing on this concept only shifts the problem to a biological level, it does not in itself answer the question how much psychological change is possible or has actually occurred over time. This question cannot be answered in general; rather, specific hypotheses have to be examined in detail.

Torben Grodal, a proponent of evolutionary psychology in film studies, dismisses Singer's arguments rather harshly:

> Ben Singer [...] follows up on Benjamin and other modernity theoreticians by seeing a link between modern psyches, stress-creating films, and stressful environments, as if stress was a kind of modern pleasure-evoking drug condition, although the physiological arousal system that supports active coping

> and provides dopaminergic pleasure by moderate activation will cause brain damage in humans and animals by prolonged activation [...].[24]

Even though I agree that Singer ultimately fails to support the psychological claims of the modernity thesis, this summary is not quite accurate. Firstly, contrary to the modernity theorists, Singer points out that increased arousal can be either pleasant or unpleasant, i.e., eustress rather than stress (but he does not make very much of this point). Secondly, he refers to research that shows how an "enriched environment," which one might regard the modern metropolis to be, enhances sensory acuity and cognitive skills. This may well be true, but it is actually a contradiction to the typical claims of the modernity theorists (see e.g., Simmel's remark that the acuity of the senses has decreased).[25] Finally, Singer refers to research that shows that prolonged stress causes nervous exhaustion, which is certainly true, but he does not provide any evidence for the central claim that this induces individuals to turn to highly stimulating leisure activities (which, contra Grodal, they might do despite negative "side effects"). In fact, there is a study that clearly contradicts this claim: In a series of experiments Laurent Brondel and Michel Cabanac have shown that people experienced various environments (with low, medium and high levels of audiovisual stimuli, including films shown on a television set) differently depending on their state of arousal; in particular, a low-stimulus environment (a bare room with dim lighting) was rated negatively when subjects were rested, but positively when they were tired.[26]

The Perceptual Basis of Film Viewing

Motion Perception

Famously, Henri Bergson called the modern concept of time as a sequence of static images – as it was employed, for example, in astronomy – the "cinematographic method."[27] However, in contrast to the time series photography of Eadweard Muybridge and Étienne-Jules Marey, the inventors of film were not interested in breaking down movement that was too fast for the naked eye to see into static images, but rather wanted to create a realistic representation of motion. This was achieved in several variants around 1895, even though the contemporary theories of motion perception were incomplete and even mistaken in some points.[28] As so often, technology was not the product of theory, but practical experiment. As Harro Segeberg put it:

> [T]he term "emergence" [...] is taken to imply that in media history, not only manifest technological and economic conditions need consideration, but also cultural configurations, which consist of autonomous, irreducible elements

(e.g., epistemes and aesthetics). Such elements cannot be derived or interconnected on the principle of strict causality, which is precisely why they are "creative," but they develop in complex co-evolution, rather than being merely contingent.[29]

We still do not know how motion perception works exactly, but it is possible to correct a few errors that one occasionally still finds today in descriptions of film technology.[30] Firstly, the perception of motion in film viewing is not based on the "aftereffect."[31] This is a perceptual effect that is experienced after fixating on one object for a while and then fixating on another object that is complementary in certain characteristics, so that it will produce a specific visual illusion (e.g., looking at a green square for a time and then at a white surface will create the illusion of a red square appearing, or fixating on a moving pattern of lines will create the illusion that a corresponding static pattern moves in the opposite direction). Such a situation is the exception rather than the rule (i.e., it hardly exists in nature), and not the one that film creates. Secondly, the "stroboscope effect" is not sufficient. The continuous motion of the filmstrip is not only interrupted by the alternation of light and darkness, but also by short stops. The stops are necessary, because otherwise only a blur would be perceived rather than the objects represented by the images. The rotating shutter that intermittently interrupts the light may show each image twice or even three times and thus reduce flickering. (Incidentally, there was no standard speed before sound film, and a flicker-free image was achieved long before synchronous sound.) The basic perceptual effect that is created in film viewing is called a phi effect, an illusion of motion that arises when similar static objects are shown in close spatial proximity and temporal succession. Depending on the arrangement of the objects, different phi effects can be created, some looking quite "unnatural."[32] For example, contrary to common belief, the wagon-wheel effect, i.e., the impression of wheels turning backwards, does not arise only in films, but may also happen when looking out of the window of a moving vehicle at the wheels of another moving vehicle.[33]

We still do not know whether our visual apparatus only samples images, which are then combined into an impression of movement in the brain (as Bergson assumed). Even if this is the case, then this sampling is much more complex than that of a film camera (due to the constant voluntary and involuntary movements of the eyes, the fact that only the center of the retina has receptors for sharp color vision, etc.).[34] Interestingly, people with a rare perceptual defect who are unable to recognize static objects in reality are able to do so when watching television.[35] It seems that the light changes of the television screen are not consciously perceived, but sufficient to excite motor neurons. Furthermore, moving images of objects cause higher arousal than static images of the same objects.[36] Hence, artificially created moving pictures seem to stimulate some sub-

conscious nervous excitement already with their technological features, similar to what Benjamin claimed, but it is hardly on the level of "shock" (and, as the research mentioned above suggests, prolonged exposure is more likely to cause fatigue rather than desire for more stimulation).

Spatial Perception

Film creates an impression of space in a similar way as central perspective does in painting, which had been discovered centuries earlier. This discovery was also made long before it was completely understood. Even though the practical discovery and the theoretical understanding required learning, the similarity to the perception of space in reality is good enough, so that seeing such a painting "correctly" does not require learning. There are at least two significant differences between central perspective and natural human vision: 1) Natural human vision is binocular, whereas central perspective, as the name says, only has one focal point; 2) Natural human vision is subject to "constancy scaling," which means that with increasing distance the size of objects decreases less than proportionally. This is a specific instance of the more general principle of "object constancy," which makes it possible to identify objects as the same under changing conditions (e.g., lighting).[37] Hence, central perspective is not a perfect representation of natural vision, but this does not necessarily mean that the differences reflect a particular "worldview," as has often been claimed.[38] For example, contrary to common belief, René Descartes was aware of the phenomenon of constancy scaling, so central perspective was not "the measure of all things" for his philosophy.[39]

Richard Nisbett has found that Asians and Europeans tend to perceive pictures differently: Europeans concentrate on objects, whereas Asians are more aware of the context.[40] If this is due to individualist vs. collectivist socialization, then this might explain why the preference for central perspective emerged along with the rise of individualism in Western countries. However, calling this a "change in perception" implies inevitability: When Europeans are instructed to pay more attention to the context, they are able to do so, as Asians are when they are asked to pay more attention to the details of objects. Significantly, the central perspective was known in Asia before the influence of Western culture,[41] whereas conversely, European modernism was later inspired by Asian art. Hence a "mode of representation" on the side of the artist and a "mode of perception" on the side of the viewer might be more appropriate terms. When psychologists attempted to explain the individual styles of modern artists with perceptual defects,[42] art historians expressed reservations, and understandably so, due to the potential of individual creativity that may deliberately diverge from everyday perception. One should grant the corresponding degree of freedom to viewers, because audiences often reject representations that they do not like, and tastes differ considerably.

The mode of representation that became less common, i.e., depicting figures according to their social importance rather than their physical distance from the viewer (*Bedeutungsperspektive*), may also have a socio-psychological interpretation: We actually do tend to estimate people that we regard as important as taller than they actually are.[43] However, this is probably better conceived as cognitive judgment rather than perception, because it is not an optical illusion: We may be surprised when we actually meet a celebrity in real life to see that he or she is much shorter than we expected, but as soon as we have this opportunity to compare, we do perceive their actual height. Historical sources show that Western artists were also aware of the fact that the perceived size of objects decreases with distance long before the central perspective was commonly employed. Hence, even though it cannot be proven, it is plausible to assume that the viewers of medieval paintings did not perceive them as "realistic," but understood them as conventional, symbolic representations – just as they are likely to have recognized the sky as blue, even though in religious paintings it was often depicted in gold. Collapsing all of these complex processes into the single concept of "perception" tends to imply that media lock viewers into "ideological apparatuses" from which there is no escape.

Technological Features of Images: Analog vs. Digital

As important as the technological characteristics of images may be in many regards (production time and cost, reproducibility, etc.), their influence on perception is often overstated.[44] For example, the camera obscura may well have been a revolutionary device for the production of paintings, but not even art historians are certain whether or not Jan Vermeer used it for his paintings.[45] If the material structure of an image is invisible to the eye, then as far as perception is concerned it makes little difference whether it consists of brush strokes, halftone grids or pixels (or only insofar as this structure produces unique, visible effects). What we perceive in each case on a higher (cognitive) level are the depicted objects, and on a lower (sensory) level light emitted from matter (i.e., in the case of digitally created images from a computer screen or a paper printout). Furthermore, in a manner of speaking, the human eye has always converted "analog" images to "digital" ones: The receptors of the retina encode the continuous stimulus of light into discrete impulses from a very large, but limited number of neurons. This causes a great loss of information, but has the advantage of faster processing.

The Future of the History of Perception

Carroll asks the question why the "history of vision"-debate exists, but does not answer it (he defers it to a later text, but as far as I know he has not returned to

the question),[46] so I would like to suggest an answer here. In addition to the practical difficulty of researching perception, the humanities are often extremely critical of the social sciences as such,[47] whereas conversely, the social sciences have almost completely lost interest in historical topics. Most scholars who have applied psychology to historical questions, regarding both their training as well as their institutional affiliation, are based in the humanities, not the social sciences. I do not think that the paradigms that currently dominate psychology, such as cognitivism and evolutionary psychology, are fundamentally opposed to the idea of historical change or unable to conceptualize it in principle. In fact, even evolutionary psychology is currently developing a new interest in environmental influences.[48] These trends do not seem to be concrete enough yet to be readily applicable to media, but if culture has more influence than has previously been thought, especially in the long term, how else could this be researched than by looking at cultural history? Comparison of cultures in different stages of "development" might come to mind as an alternative, but due to many confounding factors, this is only an approximation. So far, however, the social sciences, and psychology in particular, have hardly contributed to the study of history themselves. I believe that there are two reasons for this: Firstly, the social sciences are more interested in practical applications than the humanities. Secondly, many social scientists believe that only the direct study of people with their established methods (questionnaires, experiments, etc.) is properly "empirical." Consequently, historical questions may not be forthcoming from the social sciences, but I do believe that psychology is useful – and even necessary – for trying to answer the historical questions that the humanities pose. Furthermore, many more theories and studies exist in psychology than have so far been applied to media history.

In the course of my article, I have focused mainly on refuting common hypotheses about perceptual change rather than contributing new ones. Reed has summed up:

> Perception has a history because what people typically are aware of changes, because the information on which awareness is based changes (especially because media – methods of displaying information – change) and because how people go about perceiving changes.[49]

I believe that even most of this is better conceived as "representation" on the one hand and "cognition" (or behavior) on the other, rather than "perception." Even though there is certainly a "gray area" between the "higher" and "lower" aspects of perception, and this "territory" is precisely where culture and biology meet,[50] which, among other things, creates potential for change, the term "perception" seems to produce confusion and exaggeration all too easily. Consequently, I prefer to be careful with it. New hypotheses and knowledge about perceptual change

may well emerge in the future, but we should not content ourselves any longer with employing perception as a pseudo-psychological metaphor. Furthermore, I do not think that change is the only question for which psychology is of interest: Whether we are studying contemporary or historical audiences, understanding the basic psychological processes of media reception is important, whether they change or not.

In 2004, motivated by the finding that the understanding of media-related behavior is still frustratingly inadequate, John L. Sherry called for a "paradigm shift" in communication studies. Sherry believes that media studies are still more or less explicitly influenced by theories of human behavior that have long since lost their dominance in the social sciences at large, because they do not adequately account for biological factors (such as behaviorism). Instead, Sherry envisions a "neuroscience paradigm," a systemic model of behavior that would investigate the interaction of biology and culture:

> Such a perspective attempts to account for the contribution of biology (e.g., sex, temperament, hormones, physical appearance, etc.) and of the social environment (e.g., parents, peers, culture, etc.). The neuroscience paradigm assumes that (a) all human behavior is rooted in neurophysiological processing, (b) one's neurophysiological makeup is genetically determined, but (c) is plastic across the life span (including *in utero*) and is therefore susceptible to environmental influence. [...] The concept of embeddedness states that humans exist within a context made up of multiple levels of being (inner biological, individual psychological, dyadic, social network, community, societal, cultural, outer ecological, and historical). [...] The system is also characterized by dynamic interaction in which influence occurs across levels of being with variables at different levels having more or less influence at different times. Hence, the individual has the potential for plasticity or change across the life span. [...] Importantly, this perspective stresses that the person is the producer of his or her own development. As such, individuals have the potential to interpret stimuli in ways that are consistent with their needs, drives, and desires. Therefore, people actively shape their environment.[51]

As Sherry's remarks show, a paradigm that is informed by biological psychology does not necessarily entail that culture is regarded as unimportant or that historical change cannot be accounted for in principle. Sherry's "neuroscience paradigm" is a theoretical framework rather than a unified theory of behavior, to which approaches from different disciplines, including the humanities, could contribute with various subjects and methods. The "history of vision"-debate has been a step in this direction, and this is why I hope that it will continue.

Will the 3D Revolution Happen? A Brief Perspective on the Long History of Stereoscopy (with special thanks to Eisenstein and Bazin)

Ian Christie

James Cameron's AVATAR inaugurated a new phase of commercial 3D cinema at the end of 2009 – and also precipitated the final stage in the full conversion of cinema to digital. Many cinema operators who had been skeptical or hostile to digital projection were persuaded that their outlay would at least be repaid by the attraction of digital 3D, however short-lived this fashion might prove, and so the tipping point was reached in digital conversion.[1] Yet AVATAR and its immediate successors were not only commercially successful on a scale that dwarfed all previous 3D releases, but also provoked an even greater hostility toward the format than its earlier manifestation had in 1952-1954. The canonical version of this is Roger Ebert's 2010 article entitled "Why I Hate 3-D (and You Should Too)," which was followed by many similar and equally extreme expressions of animosity.[2] Ebert's main assertion was that the process "adds nothing essential to the moviegoing experience." Among other reasons he gave for "hating" 3D were: "for some, it is an annoying distraction [...] for others, it creates nausea and headaches"; adding for good measure that "it is unsuitable for grown-up films of any seriousness" and "limits the freedom of directors to make films as they choose."[3]

Most of Ebert's assertions are obviously polemical or subjective. In addition to box-office results, there is in fact considerable evidence that many have found 3D does "add" to their moviegoing experience. A survey commissioned by the UK Film Council and British Film Institute in 2011 recorded AVATAR as the third most frequently cited film that "affected" a balanced sample of UK respondents, with many commenting on its spectacular visual effects and on how 3D intensified their emotional engagement.[4] And empirical research comparing viewers' experience of the film seen in 2D and 3D found that the latter created great "presence" or immersion overall.[5] Subsequently, two non-mainstream films, CAVE OF FORGOTTEN DREAMS (Werner Herzog, 2010) and PINA (Wim Wen-

ders, 2011) enjoyed wide success and acclaim in the art house sector which had hitherto been hostile to 3D. But such evidence seems unlikely to persuade those who have felt affronted or "conned" (according to Mark Kermode[6]) by 3D since its return in 2009, regarding it as, in Thomas Elsaesser's colorful summary, "an aberration, a travesty, and an abomination."[7] What I wish to focus on here is the recurrent argument, already voiced in the 1940s, that 3D "adds nothing" to normal cinema experience; or that if it does "add something," this is either gratuitous or distracting.

Cinema history, of course, records similar responses to earlier additions to cinema's prevailing regime. The introduction of synchronized sound and of photographic color (as distinct from applied coloring) were resisted by many at the end of the 1920s, largely on the grounds that these intruded into a medium which was felt to be already mature. An editorial in the avant-garde journal *Close Up* in 1928 spoke of the "future of pure cinema" as "safe in Soviet filmmakers' hands," faced with the "excrescent and reactionary strivings of talking and talking color films."[8]

Even earlier, the very invention of moving pictures or "animated photography" had been deplored as "unnecessary." An art critic writing in 1896 was clear that the Cinematograph had no artistic value, but might prosper "statistically," by mechanically reproducing what was placed before it as "slabs of life."[9] However, there can be no doubt that during the 1930s, "an explicit and pure style of silent film" was felt by some to be under threat from synchronized sound, color and even stereoscopy, even though it is unclear how widely and coherently this view was held.[10] What is less widely understood today, by cultural critics and within the industry, is that a similar sense of crisis reappeared at the end of the 1940s, after sound and color had been assimilated, and that the new threats to "film as art" were seen to be changing screen format and the first demonstrations of Polaroid 3D, as well as the looming challenge of television.

Many of the complaints against 3D that have surfaced since 2010 were first heard between 1946 and 1954, accompanied by denunciations of the widescreen format that became established with Cinemascope in 1953. But there were also trenchant arguments voiced in support of these new formats, which remain little known; and two of the most intriguing were by André Bazin and Sergei Eisenstein, neither of whom have traditionally been seen as engaged in the 3D debate.

Total Cinema

Several generations of film students are familiar with Bazin's seminal text "The Myth of Total Cinema," possibly one of the most widely quoted and anthologized of all writings about the origins of cinema. This was in fact a review of the first volume of Georges Sadoul's history of cinema, *L'Invention du cinéma 1832-97*, which dealt more comprehensively than before with the pioneers of moving

images. From this, Bazin concluded that the 19th-century inventors saw "in their imaginations [...] the cinema as a total and complete representation of reality [...] the reconstruction of a perfect illusion of the exterior world in sound, color and relief."[11] Probably few of the many who have read this have noticed the inclusion of "relief," since Hugh Gray's non-translation of "*relief*" does not immediately evoke stereoscopy in English.[12] However Bazin continues in the same vein, crediting a French historian P. Potoniée with the view "that it was not the discovery of photography but of stereoscopy, which came onto the market just slightly before the first attempts at animated photography in 1851, that opened the eyes of researchers."[13] And he adds, "there was not a single inventor who did not try to combine sound and stereoscopy [relief] with animation of the image."[14]

Bazin would write two short articles about stereoscopy in the 1950s, immediately before and after the brief period when 3D films were being widely seen and discussed, as part of the industry's response to what was perceived as the threat of television. The first, published in 1952, offered a brisk survey of stereoscopic theory and processes as a prelude to welcoming Norman McLaren's animations in "artificial 3D," which Bazin reported being "as difficult to describe to anyone who has not seen some of this prodigious film artisan's 'flat' animations," but best described as "abstract painting in motion and 3D."[15] For Bazin, 3D film may be "a trivial scientific curiosity," but he predicted it would probably make "a leap as great as that from L'ENTRÉE DU TRAIN (Lumière, 1896) to the train engine sequence in LA BÊTE HUMAINE (Renoir, 1938)."[16] Bazin insisted that the demonstrations at the Festival of Britain in London "already proved that 3D affords the same interpretations, with an operation as orchestrated and utterly artistic as 'flat' cinema," and invited his readers to "quickly take this new and decisive step towards total cinema."[17] The echo of his review six years earlier is unmistakable: realizing projectable 3D marked an important step toward making that "myth" of the previous century's obsessives and visionaries a reality.

Eisenstein and Stereo in Depth

Sometime in late 1947 or early 1948, Sergei Eisenstein wrote a long essay on "stereo-cinema," which has been claimed as his last completed text.[18] Having first appeared in English in 1949, this was included in the third collection of Eisenstein's writings in English, *Notes of a Film Director*, in 1970.[19] For unknown reasons, the essay exists in two versions, with the English version omitting a long central section of some 20 pages, presenting in effect the beginning and end of Eisenstein's passionate advocacy of stereoscopy.

The most immediate reason for the essay was that the Soviet film industry had just produced its first stereo feature film, Aleksandr Andrievsky's ROBINSON CRUSOE which was released in November 1947, with Crusoe played by Eisenstein's former pupil, Pavel Kadochnikov (who had played Vladimir in IVAN THE

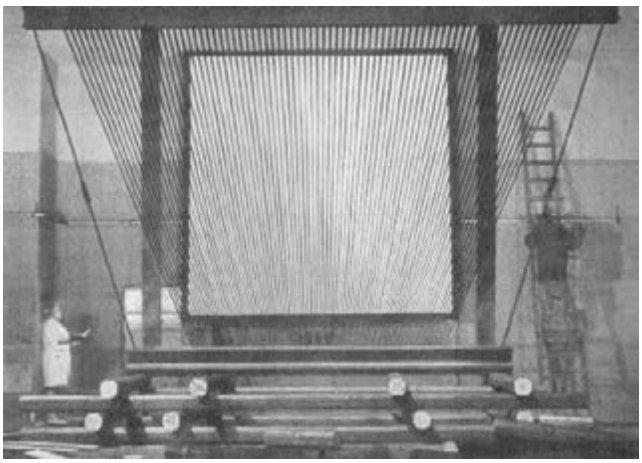

Fig. 1: The Ivanov autostereo system screen in Russia from 1941.

TERRIBLE PART 2 [1958], which, however, was then banned, and would not be seen until the late 1950s).[20] One phrase indicates that Eisenstein *had* seen ROBINSON CRUSOE: he talks about Robinson's raft trying to slip past the tangled lianas as "one of the best stereoscopic shots," before going on to use it as the basis of a rhetorical flourish: "the day is near when, instead of rafts, we shall see galleys, frigates, cruisers, battleships and dreadnoughts arriving in stereoscopic film ports."[21] What Eisenstein does not mention is that the film was presented in a pioneering "autostereoscopic" format, using a specially constructed screen which did not require viewers to wear glasses.[22]

Anticipating the optimism of Bazin, Eisenstein asserts that "it is as naïve to doubt that stereoscopic film is the tomorrow of the cinema, as it is to doubt that tomorrow will come."[23] Linked to this confident claim is a political argument: "the bourgeois West treats the problem of stereoscopy either with indifference or scorn, but the inventors and researchers in the Land of Soviets, its government and its leading officials, pay a great deal of attention to it."[24] Eisenstein takes as his target the French scriptwriter and sometime editor Louis Chavance, who had written skeptically about stereoscopy in July 1946.[25] The quotations Eisenstein cites amount to asking – as many have done once again – who needs it? What will it add to drama or comedy, even if it has some application to filming sculpture? Eisenstein brands Chavance "conservative" and "obscurantist," hence a typical proponent of Western ideology. We Soviets, he continues, are different; and the essay ends with a paean of praise for "the glorious and triumphant tomorrow [...] and those who have joined us in leading mankind towards a bright future!"[26]

The tone of this polemic is similar to that of a number of articles written in 1947, including the notorious "Purveyors of Spiritual Poison," in which Eisenstein attacked a number of recent American films as examples of "the skill, in-

ventiveness and technical mastery of American cinema used in the service of darkness and oppression," singling out Griffith's The BIRTH OF A NATION (1915) as an "ultra-reactionary" film that "celebrated the formation of the Ku Klux Klan, a fascist organization."[27] There were many contextual reasons for this harshly critical stance. After the Central Committee's banning of IVAN PART 2, Eisenstein had published a ritual self-criticism, but was still hoping to be allowed to "correct" the film. More generally, since 1946 Stalin and Zhdanov had emphasized the need to politicize all areas of life, with a special emphasis on ending cultural and scientific deference to the West.

But even if these factors influenced the framing of the essay, and its professed scorn for Western "backwardness," the main aim of the full-length text is to outline an historical poetics of stereoscopy.[28] After his opening declaration on the "inevitability" of stereoscopic cinema, linked to the triumph of ROBINSON CRUSOE, Eisenstein proposes an argument not unlike that of his essay on Disney and animation, based on what would today be termed evolutionary biology.[29] Forms of art, he claims, stem from what is deepest in human nature, and their survival is governed by the same law of natural selection that prevail in other spheres of life. An example of non-survival that he offers – which reflects the prevailing hegemony of Socialist Realism at this time – is "so-called 'pure' abstract art," "which could exist for a short period as a reflection of the doomed social class than engendered it." Eisenstein's counter-example is "a no less abstract form of art that has existed unchanged for centuries – the circus." Circus, he claims, deals in "feats of dexterity, strength, self-possession, purposefulness – all in keeping with man's inborn striving for the fullest development of these abilities." Likewise sport "provides us with the most perfect forms of exercising our natural faculties, not only as spectators but as active participants."[30]

From this standpoint, the test for 3D being a valid art form with a future must be that "it answers some inner urge, some requirement of human nature," and there should be a history of striving to satisfy this urge "through different stages of social development and artistic means."[31] But before exploring this history, Eisenstein offers a brief phenomenology of the stereo-cinema illusion, noting three main effects. First, there is representation which stays within the experience of conventional cinema, "like a flat high-relief suspended on the surface of the screen"; secondly, the representation "recedes deep into the screen, drawing the spectator into unknown depths"; and thirdly, the representation "'falls' out of the screen into the auditorium" – an effect which can be "overwhelming."

Although these mark a new stage in creating and manipulating the illusion of volume for the spectator, Eisenstein argues that on close examination stereo-cinema is only developing tendencies which were already inherent in cinema at the time of its birth, bringing these to a more perfect expression. A similar realization followed the introduction of synchronized sound and color: these were improvements on what had been present but inhibited in silent and monochrome

cinema. So, stereo-cinema favors "foreground composition," placing objects near the camera to accentuate depth – a style which Eisenstein traces back through his own films, from the famous image at the end of IVAN PART 1 (1944), with the Tsar in close-up profile and a column of his subjects snaking away into the distance,[32] through many compositions in the unrealized QUE VIVA MEXICO! (1932), including the Day of the Dead and a woman's face in close-up along the diagonal of a pyramid, and further back in OLD AND NEW (1929) and even in STRIKE (1925). A similar tendency can be found in the Hollywood tradition that runs from Erich von Stroheim, through his former assistant William Wyler's JEZEBEL (1938) and THE LITTLE FOXES (1941) – in which Eisenstein describes the use of the wide-angle 28mm lens as "almost abusive" – up to CITIZEN KANE (Welles, 1941), which takes this technique "to the level of trickery and the absurd." Earlier, such compositions were also frequent in the work of Degas and Toulouse-Lautrec, Eisenstein observes, testifying to the influence of Japanese models on these artists, and feeding his own precocious attraction to this technique.

He admits that the most evocative examples of this tendency are still found in "flat cinema," which is explained by the necessity of using the "least expressive" 50mm lens when shooting in stereo. But despite such current limitations,

> it is stereo-cinema that gives us the real sensation of the two main spatial tendencies in contemporary cinema: that of "sucking" the spectator towards what was formerly the surface of the screen, and of "discharging" over him what hitherto remained flattened on the mirror of its surface.[33]

Why should these new expressive possibilities of stereo-cinema exercise such a powerful appeal for the spectator? Eisenstein's answer is that, if "ordinary" cinema is the offspring of Edison and Lumière, stereo-cinema is also the great-grandson of theater, of which it represents the latest and most socially developed form.

What follows (and was omitted entirely in the English versions) is a lengthy excursus on the history of theater, which Eisenstein divides into three main phases. In the first "primitive" stage, reaching back into prehistory but also surviving until recently in the collective rituals of Bali and Siam (Thailand), there is no distinction between performer and spectator: all participate.[34] The second phase in all its varied forms is characterized by an "organic union" between action and audience, where the performance seems to penetrate a mass of spectators. In such forms, he suggests, there is immediately a "nostalgia" to unite the dissociated roles of performer and audience, by seating arrangements which bring at least some audience members close to the performance area, or enable the performers to mingle with spectators. This nostalgia is not just a feature of the modern era, Eisenstein insists, but is present throughout the long history of

Fig. 2: Jacques Callot, engraving, The Combat at the Barrier (1627), recording an entertainment for the Duke of Lorraine in Nancy, with the audience surrounding the performance and participating in it.

theater as we know it. His examples range across the history of carnival, court masques and baroque theater (citing engravings by Baltazarini and Callot), the move to arena-style auditoria in the later 19th century (as in Wagner's Bayreuth Festspielhaus), the Japanese Kabuki theater, with its *hanamichi* runway linking stage and auditorium, up to performance in the round in the 20th century, and finally to the Russian and early Soviet avant-garde theater, from Eisenstein's former mentor Vsevolod Meyerhold, the great Symbolist producer turned Constructivist, to his own work at the Proletkult, with his 1921 productions of *The Mexican* and *Léna*, both seeking to engage the audience in avant-garde ways and challenge theatrical convention.

Even in conventional theater, Eisenstein finds revealing examples of this desire to create a connection, often by verbal means, as in long speeches clearly addressed to the audience rather than other characters, and he cites an anecdote from the Moscow Art Theatre – described as the last defender of the "fourth wall" – where the great actor Ivan Moskvin regularly played the governor in Gogol's *Dead Souls*, and once shouted at the audience: "What are you laughing at? It's yourselves." In this same passage, he recalls a conversation with Pirandello in Berlin, when the playwright spoke of wanting to write a film script in which characters would argue with the projectionist – and this prompts a recollection of the anarchic comedy HELLZAPOPPIN (Potter, 1941) where this does indeed happen. But what cinema also offers – making it effectively the third phase in the history of theatrical representation – is the ability to "make illusion almost tangible," through its use of elements of reality "transformed by the creative will of the artist."[35]

The "simple technique" of cinema has long been able, "by means of lens and microphone," to make us "invisible observers of the most secret actions taking place within four walls."[36] But, Eisenstein insists, "the cinema as art" wants to go further, beyond the interior monologue (which he had identified in the early 1930s as one of the major opportunities granted by sound), to "penetrate into the inner processes of thought and feeling." In contrast to the preceding condensed history of theater, which drew on a lifetime of theatergoing and research, Eisenstein's account of the growing tendency to "subjectivize" cinema was clearly influenced by his recent viewing and access to Western cinema literature.[37] In rapid succession, he cites the "I" of the narration in Hitchcock's REBECCA (1940), the psychoanalytic basis of SECRETS OF A SOUL (Pabst, 1926), SPELLBOUND (Hitchcock, 1946) and LADY IN THE DARK (Leisen, 1943), the dream sequences of The LOST WEEKEND (Wilder, 1945) and DREAM GIRL (Leisen, 1945/48),[38] and the first-person camera in DR. JEKYLL AND MR. HYDE (Mamoulian, 1931), LADY IN THE LAKE (Montgomery, 1947) and A MATTER OF LIFE AND DEATH (Powell, Pressburger, 1946). All of these serve, in different ways, to align the viewer with the central character's perception, and clearly fascinated Eisenstein, even if he feels obliged to denounce them as examples of a "pathological introspection towards which Western 'creators' have turned, breaking with the healthy realism that would not serve reaction."[39] However, like the increasingly frequent breaches in theater's "fourth wall," they demonstrate an immersive ambition, reaching toward that "aspiration" which Eisenstein detected in earlier phases of culture.

For Eisenstein, Aldous Huxley's satirical vision of the future in *Brave New World*, with movies replaced by "coloured and stereoscopic feelies," offering a new level of erotic stimulation to their viewers, amounts to an ironic diagnosis of the fate of bourgeois culture, aided by its science.[40] His defense of stereocinema in Soviet hands insists that it is democratic, uniting performers and audience; and thus embodies "progress," in socioeconomic as well as aesthetic terms, just as synchronized sound and color did, confirming cinema as the third phase of theater – recapturing that primordial unity of performer and audience. So those who attack it, like Chavance, can be dismissed as bourgeois defenders of an elite form of cinema and theater.

The confrontational rhetoric of the early Cold War may make Eisenstein's advocacy of 3D seem naïve, or merely propagandist, but it also fits well with his major conviction that cinema constituted the latest phase of social ritual leading toward the "art-work of the future." Just as the history of theater reveals a struggle to overcome the early schism between performers and audience, cinema initially entrenched this breach during its first half-century, but was now on the brink of solving the problem. To ask "what does stereo add" would be to miss the point, according to Eisenstein, since it obviously enhances the immersive realism of cinema-theater. In an extraordinary finale, the essay ends by listing recent

technological developments which have extended human capacities (infra-red glasses, radar, computers), arguing that these all require "absolutely new arts, unknown forms and dimensions, going beyond the palliatives that traditional theatre, culture and cinema are revealed to have been."[41] Hailing the advent of "a new dynamic stereoculture," he insists that there is nothing to fear in the coming of this new era of art. Instead, echoing Wagner's call for a new kind of artwork, we should,

> prepare our consciousness for the coming of new themes which, multiplied by the potentialities of new techniques, will demand a new aesthetics for successfully realising these new themes in the novel, breath-taking works of the future.[42]

Stereo Installations and the Battle of the Formats

Although it is the short-lived Hollywood 3D wave of 1952-1954 – which included Bwana Devil (Oboler, 1952), It Came from Outer Space (Arnold, 1953), House of Wax (De Toth, 1953), and Dial M for Murder (Hitchcock, 1954) – that has loomed large in accounts of the history of 3D, it was in fact stereoscopic installations as part of exhibitions or as stand-alone attractions that convinced many of its potential. The launch of Robinson Crusoe had followed the earlier establishment of a permanent Stereokino in Moscow, which showed an 80-minute program of three films in Ivanov's "autostereoscopic format." After visiting this, Ivor Montagu, a producer, critic, co-founder of the Film Society in London and friend of Eisenstein, wrote:

> When all film is stereoscopic and we have forgotten that we ever accepted the convention of the flat-image as real, it seems unlikely that we shall remark on the stereoscopic film's appearance of reality, any more than we remark at present on the conventional flatness of the two-dimensional film.[43]

Such installations were in vogue in the post-war world, and at the UK's 1951 Festival of Britain, the Telecinema (the forerunner of the British Film Institute's Southbank cinema complex) displayed two technological marvels, large-screen television and stereoscopic films, which the future theorist and filmmaker Peter Wollen recalled as a vivid childhood memory:

> When I was thirteen years old, I went to the Festival of Britain, a kind of World's Fair which was held in London to celebrate the Hundredth Anniversary of the Great Exhibition of Victorian times [...]. The Telekinema was the first theatre specially built to project television onto a large screen – as you sat waiting for the films to come, you watched the rest of the audience as they

were televised entering the theatre.[44][...] The main programme consisted of specially made films for which you had to put on polarizing glasses, with one lens red and the other green. There were two animation films in the programme, made by Norman McLaren, and a demonstration film of the London Zoo. For me, the great moment was when the giraffes stretched their necks out from the screen and high over the audience, as though you could stretch up and touch them.[45]

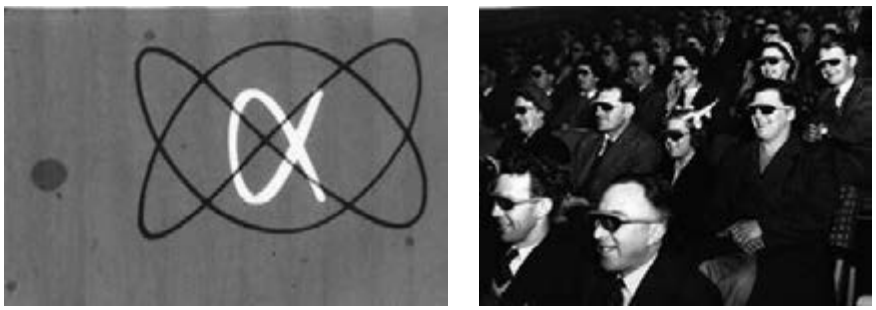

Fig. 3: Norman McLaren's "artificial" 3D film Around and Around, *using an oscilloscope image, was seen by large and enthusiastic audiences in London and Paris in 1951-52.*

Bazin was similarly inspired when he wrote about 3D in 1952, after the 3D films from the festival of Paris were shown in Paris, and he refers to the theoretical work that lay behind this program by Raymond Spottiswoode.[46] Having analyzed the geometry of the stereoscopic illusion, involving the axis of convergence of the two camera lenses and the focal plane of the image, he announced that Spottiswoode had paved the way for variation in apparent depth, so that "the filmmaker now has as much creative control over the third dimension as his various lenses give him over framing and visual style."[47] For Bazin, this brought 3D into the same creative sphere as the deep focus staging he admired in Welles and Wyler, which depended on the use of the short focal-length lens (Bazin was already writing with enthusiasm about deep focus in Wyler and Welles at exactly the same time as Eisenstein, although his more familiar texts date from the 1950s; and he would not have known of the cameraman Gregg Toland's involvement with a pioneer 3D camera system in the 1930s).[48]

However, what excited Bazin's admiration most was the "artificial 3D" created by McLaren "using only one standard camera and calculating the precise separation and axis of convergence for each part of the image."[49] Instead of the separated planes and dioramic effect of early 3D, Bazin found in McLaren's "poetic sensibility" evidence that modern 3D "lends itself to the same range of interpretation and concerted use for artistic purposes as 'flat' cinema." Evoking Fernand

Léger's transposition of his painting practice into black-and-white photography in BALLET MÉCANIQUE (1924), Bazin suggested that "today stereoscopy in color would give him a means that is purely painterly and unimaginable outside stereoscopic cinema [...] to create moving forms in space."[50]

Bazin's initial argument in favor of 3D cinema is thus substantially different from Eisenstein's, which rested on the re-creation of a revitalized shared space between viewer and percept. Bazin is attracted by the potential, glimpsed in McLaren's NOW IS THE TIME (1951), for a fundamentally new plastic experience, unconnected with enhanced "realism." However, three years later, Bazin wrote again on the subject in the same journal, in an article entitled "The 3D Revolution Did Not Happen."[51] New technical processes were launched under the banner of stereoscopy [*relief*], he writes, "and perhaps a true stereo cinema would have constituted a real revolution, comparable to that of sound." What happened instead, eclipsing the short-lived promotion of 3D, was the launch of Cinemascope in 1953, which prompted Bazin to observe that

> no-one today, even if watching a film in cinemascope, imagines this is cinema in three dimensions. As for the only commercial process that truly offered the impression of depth, that based on anaglyphs and perfected with Polaroid glasses, its failure was so rapidly clear that the films made in this process were more often seen in flat versions.[52]

1953 had marked the apogee of 3D's first commercial presentation, with the result that even films made in the format were largely seen "flat," like Hitchcock's DIAL M FOR MURDER. By 1956, 3D was already a distant memory, and one tainted by "failure." The Bazin who had foreseen great potential in McLaren's short films was now pragmatically weighing the commercial success of Cinemascope ("already installed in 32,000 cinemas") against its artistic significance. His conclusion was that *all* the new techniques – which included Cinerama and VistaVision, as well as Cinemascope – had some negative consequences for the quality of projected image, often blurred or cropped – but on balance could be considered "rather positive without being revolutionary." The most positive result was that

> in place of the old screen with immutable proportions, [there are now] three or four different formats to break old habits and stimulate the formal imagination of filmmakers, leading them to re-think anew their mise en scene (cf *Lola Montes*). Equally, the attention aroused by all this commotion can only help to attract the curiosity of spectators.[53]

Since Bazin is often miscast as an aesthetic conservative, it is refreshing to find him reporting from the midst of the "battle of formats" of the early 1950s in such

a pragmatic tone. A footnote to the 1956 article even suggests that "the famous, sacrosanct [principle of] framing may not be as important as is it considered to be by the aestheticians of cinema."[54] Amid widely differing standards of presentation, with many cinemas poorly converted for widescreen formats, Bazin proposes the "practical conclusion that an informed and well-organized spectator must not only choose their films carefully but also the cinemas they patronize."[55]

Expanding the Screen

The "failure" of 3D in 1952-1954 continues to be cited as a reason why we should be suspicious of its return in digital form; and this failure is often assumed to be the result of audience rejection. However, as long ago as 1980, Peter Wollen concluded that "exhibitors [...] defeated 3D," having "consistently resisted conversion costs."[56] Cinemascope, he added, "was able to make headway because it involved minimal adaptation of the projector, under the economic pressure of competition from TV (*and also to eliminate 3D*)."[57] Looking back at the enthusiasm displayed by both Eisenstein and Bazin after their first encounter with 3D, it is striking that both invoke histories of anticipation – Bazin reaching back to the pre-cinema era of optical inventions, and Eisenstein to the long history of dramatic performance – to justify their sense that this would "complete" the cinematic illusion, together with stereophonic sound.[58] Neither assumed that it would merely "add something" to existing cinema, even if this represented its initial novelty value, but rather that it could usher in new possibilities, and potentially a new art form.

The two main progenitors of moving pictures, Thomas Edison and Louis Lumière, both believed that their inventions were incomplete without stereoscopy. According to the pioneer film historian Terry Ramsaye, Edison included "the stereoscopic picture idea" in what was described as "an obscure and abandoned patent application" from 1891, three years before the Kinetoscope made its public debut.[59] In practice, however, combining the phonograph with moving pictures fully occupied his attention. The Lumières registered a patent for an Octagonal Disk Stereo Device in 1900, at a time when many others also patented devices for stereo projection, but none apparently with any success. However Lumière persevered, and in 1936 published an article on "Stereoscopy on the Screen," with a drawing of a projection system, followed by a patent for a special colored screen in 1938.[60] Yet the 3D films that Lumière had shot were not seen in 3D until 2010, when the installation of digital projection that AVATAR and its successors promoted made screenings possible.[61]

There are indeed parallel "long histories" involved, and as Bazin's 1955 article makes clear, it would be misleading to focus on 3D in isolation, even during its brief 1950s heyday. We need to consider instead two broad issues, which have been intermittently intertwined, yet are distinct: the place of 3D in cinema and

the place of cinema in stereoscopic practice. Since the mid-1990s centenary celebrations, traditional "birth of cinema" narratives have increasingly been superseded by multi-dimensional histories of the technologies that coalesced to become "cinema" from around 1912 until the first decade of the 21st century. Despite recurrent efforts to isolate a particular phase of this history as cinema "proper," and to defend it against vulgar "additions" (sound, color, 3D, variable screen-shape, video, digital imaging, live performance transmission), the social practice of cinema has vigorously modified and re-invented itself for over a century. Nearly twenty years before his stereo-cinema essay, Eisenstein had argued that cinema should forsake its slavish attachment to the horizontal rectangular screen, "based on deductions from traditions in the art forms of painting and stage practice," and instead experiment with a variable "dynamic square."[62] The occasion was a debate then under way in Hollywood about the desirability of a widescreen format known as "grandeur film," and Eisenstein's arguments drew on a range of sources as eclectic as in his 1948 essay, including references to the physiology of perception, claiming that the human eye could accommodate vertical scanning as easily as horizontal, and to the impact of the still-new synchronized sound.[63] "Acoustics help optics!" proclaimed Eisenstein, on the threshold of the sound era, claiming that this offered a chance to rethink *all* the parameters of cinema, and anticipating the call for stereophonic sound he would also make in 1948.[64]

Eisenstein may have been one of the most outspoken and theoretically minded of major directors, but there were others arguing for radical change in cinema's presentational format. Michael Powell, for instance, shot OH, ROSALINDA!! in Cinemascope in 1955, although later lamenting the poor quality of lenses then available, and in the following year he would film THE BATTLE OF THE RIVER PLATE in VistaVision, relishing its greatly increased frame size and hence immersive potential.[65] Looking back at these experiences of "early adoption," he referred to having "always been against projecting [the image] in the cinema with a black surround," instead of having using photo-electric cells to create a "sympathetic surround for color films, so that the overall tone on the screen wouldn't suffer."[66]

Besides questioning the dominance of standardized formats, it is equally important to remember that "film" – in the physical sense of a transparent image-strip of whatever gauge and composition – despite being long at the center of this ensemble, has never been confined to cinema(s), having also been part of domestic, "non-theatrical" practices. From the point of view of stereoscopy, film-strip technology was arguably the major obstacle to its widespread adoption, since it required either precise synchronization of two projectors, or a reduced size of side-by-side image on the same filmstrip. Digital projection has vastly simplified this process, making possible AVATAR and its successors.

The fact that almost all aspects of moving-image practice now use digital technology has not, however, eliminated use of the terms "film" and "cinema" (or their equivalents in other languages). Whether we will continue to call this "multiple and multiform" ensemble *cinema* is both a lexicological and an aesthetic or philosophical question.[67] But within it, 3D is perhaps best understood as something like a comet, returning at periodic intervals to light up the sky of cinema with a spectacular display, before retreating into darkness. The 1952-1953 perihelion has been vastly exceeded in magnitude by the post-2010 return of digital 3D, although this now seems to be waning, in both creative and commercial terms.

Two New Visual Cultures: Depth before Movement

A second issue, however, is that of "stereoscopic culture," most of which lies outside cinema, and whose history is more continuous, and certainly much longer and fuller, than recent polemics would have it. The term dates from 1838 when Charles Wheatcroft gave a paper on binocular vision at the Royal Society, and demonstrated a mirror device that he called a stereoscope, "to indicate its property of representing solid figures."[68] Wheatcroft used hand-drawn images, but after Daguerre's and Fox Talbot's demonstrations of fixing a photographic image in 1839-1840, photography offered an obvious way to produce matched images reliably; and in 1849 David Brewster constructed a lenticular, or lens-based, stereoscope, which was soon mass-produced by the French instrument maker Jules Duboscq.

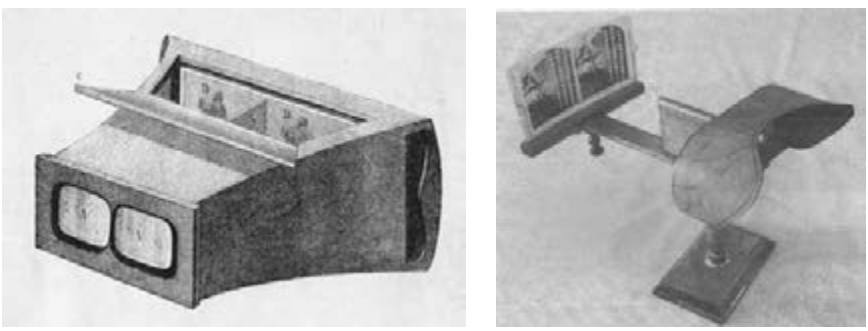

Fig. 4: Brewster's lens-based stereoscope and the simplified Holmes version. Versions of these would dominate the home-3D market for the second half of the 19th century.

Between the 1850s and the early 20th century, the stereoscope became a ubiquitous domestic appliance, arguably the first modern communications device in a series that would eventually include the telephone, radio and television. The

Fig. 5: The Great London Exposition of 1862 received over six million visitors, and images from it published by the London Stereoscopic Company helped consolidate their early dominance of the stereo market.

London Stereoscopic Company, founded in 1854, aimed to have "a stereoscope in every home," and after the American polymath Oliver Wendell Holmes, Sr., launched his elegantly simplified model in 1861, a variety of types proliferated.[69] In a famous article from 1859, Holmes envisioned the device's development:

> The consequence of this will soon be such an enormous collection of forms that they will have to be classified and arranged in vast libraries, as books are now. The time will come when a man who wishes to see any object, natural or artificial, will go to the Imperial, National, or City Stereographic Library and call for its skin or form, as he would for a book at any common library.[70]

Holmes's prediction was fulfilled to the extent that the London Stereoscopic Company's catalogue offered 100,000 views by the early 1860s and Underwood and Underwood in New York were selling 10 million per year by 1900. The stereoscope rapidly became what we can recognize as a prototype for many subsequent media systems, such as picture postcards and cigarette cards, and more technological media, such as the magic lantern and the phonograph, in which a privately owned device gives access to a repertoire of pre-recorded items. Much that was later expected of film was indeed already anticipated in the industrialization of stereoscopy. And as Potonniée, Sadoul and others would suggest, the wide popularity of the stereoscope has as plausible a claim to having inspired the drive toward "animated photography" as any simple desire for moving pictures.

There was also a social or communal dimension of stereoscopy, often forgotten in Anglo-American accounts. Projecting stereo images by magic lantern proved difficult, despite many attempted solutions between the 1850s and 1890s,

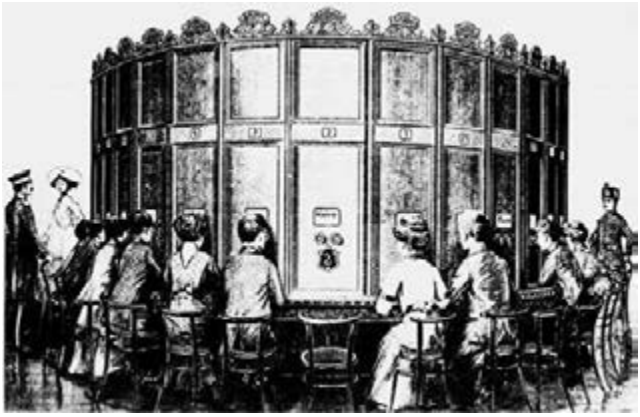

Fig. 6: August Fuhrmann's "Kaiserpanorama" allowed multiple spectators to view stereo images simultaneously, with the slides being changed automatically.

and the term "Stereopticon" commonly used for a twin-lens or biunial lantern in the United States has often been mistakenly thought to imply successful stereo projection.[71] However, after a display at the 1855 Paris Exposition, stereoscopes began to be arranged in circular structures, so that a number of viewers could see a succession of views that were changed automatically.[72] Having seen this display, Brewster envisaged "sixty views of Rome placed on the side of a revolving polygon with a stereoscope before each of its faces, [so that] a score of persons might [...] see more of Rome, and see it better, than if they had visited it in person."[73] This public deployment of stereoscopes was developed on a commercial scale by several entrepreneurs, one touring a cylindrical structure with a clockwork mechanism to advance fifty glass stereographs, and another creating a network of 250 permanent "Kaiser-Panorama" establishments, mainly in Germany and Central Europe, which offered a 30-minute travelogue to twenty-five patrons, backed up by an elaborate distribution system to refresh the program. The quality provided by these systems was considerably higher than that of printed stereocards viewed at home, and a number survived well into the 20th century – joined in the 1890s by Kinetoscope and later Mutoscope parlors in the first phase of moving image exhibition.[74]

Looking back from our present vantage point, it is clear that the relative positions of cinema and stereoscopy changed during the early decades of the last century. While one emerged from music halls and fairgrounds to became a shared, predominantly social and commercially driven experience with seemingly universal appeal (although home cinema continued the traditions of 19th-century domestic entertainment), stereoscopic entertainment apparently lost ground and became "old fashioned." No doubt the popularity of Eastman's box cameras contributed to a shift in photography toward "personalization," rather than forms

requiring more complex procedures. Equally, the proliferation of cheap colored picture postcards may have eroded stereoscopy's former preeminence in topography and travel.

Entertainment and leisure applications may have led the way in stereoscopy during the 19th century, but with Röntgen's discovery of X-rays in 1895, new vistas in medical imaging appeared. A patent for making stereoscopic X-ray images was filed in the same year, and medical applications of stereoscopy have since proliferated.[75] The unprecedented scale of carnage in the First World War created an urgent need "to localize the projectiles inside a soldier's body," and this was initially achieved by means of tomography, or "slice radiography," "showing cross-sections through body parts at regular intervals," before computer-aided scanning (CAT), introduced in 1972, led to magnetic-resonance imaging (MRI), which today offers "two- or three-dimensional images of great quality."[76] Other medical applications of 3D include teaching, pre-surgical planning, and imaging for public engagement. The other main field which quickly adopted and developed stereoscopy was warfare, with gun-sighting an early application, followed by aerial reconnaissance, bomb and missile aiming, and today an expanding field of "military training, visualization and remote observation applications," according to the website of a major supplier of such systems.[77]

One 3D innovator who benefitted from military interest in his work was the pioneer of polarization lenses, Edwin Land. Land contributed to a strong 3D presence at the 1939 New York World's Fair, where for "ten magic minutes" over one and a half million visitors saw a stop-motion animated film featuring the assembly of a Chrysler car, using Land's polarized filter system.[78] The 3D film proved so popular that another was made, in color, for the 1940 Fair; and as already noted, the Festival of Britain would provide a UK platform to demonstrate advances in 3D cinema at the Telekinema, where some half million spectators queued to fill every seat during the 22 weeks of the 3D programs.[79] More permanent 3D installations would become a feature of IMAX theaters, then mainly in museums, from 1985 onwards, and Disney entertainment parks, where a specially produced 3D science-fiction short, CAPTAIN EO, directed by Francis Coppola, made its debut in 1986.[80] The group viewing experience of projected 3D had become part of the revival of the fairground-com-expo begun by Disney in 1955, where it would exemplify the futuristic "Tomorrowland" theme that was an intrinsic part of Walt Disney's vision.

Meanwhile, the re-birth of "domestic" 3D also began at the 1939 World's Fair, where visitors could sample the earliest model of what would become the View-Master, a sleekly modern handheld 3D viewer that used Eastman's vivid new Kodachrome emulsion stock to present "reels" (actually discs) mainly of spectacular scenery. This phase of the modernization of 3D continued in 1947, when the Stereo-Realist Camera was launched for the US amateur market, using what would become the standard photographic format of 35mm reversal film, and

Fig. 7: 3D at the 1939 New York World's Fair, with a Chrysler advertising film shown in Polaroid 3D and the launch of the View-Master home viewer, re-kindling enthusiasm for "personal stereo."

attracting a new generation of amateur 3D enthusiasts who were soon served by a growing number of manufacturers.[81] In 1952 Bolex introduced a 3D 16mm movie kit, also aimed at the amateur market and no doubt linked the rising tide of interest in commercial cinema at that time.[82] Interest in 3D has persisted among amateur photography and film communities, and has continued into the digital era, with Pentax cameras offering a simple 3D system from 2002 and enthusiasts using two camcorders to create "DIY" 3D. A new digital 3D camera by Fuji, appropriately appeared in 2009, the year that ended with AVATAR – as if once again symbolizing the potential reunion of the domestic and the spectacular branches of stereoscopy. Meanwhile, many television receivers have been marketed as "3D ready," in anticipation of the growth of 3D television transmissions beyond the limited currently offer available.[83] And "live 3D," as seen at recent music festival performances, seems to be emerging as a new form.[84]

The Revolution Postponed – or Defeated?

At the time of writing, it is received opinion that the "3D boom" in cinema which began in 2010 has waned;[85] and confident predictions by the major electronics companies, led by Sony, that 3D television and gaming consoles were about to conquer the domestic market have become noticeably muted. For skeptics and vocal opponents, this merely confirms its novelty status, and the hollowness of aesthetic claims. More dispassionate observers might argue that until "autostereo" systems are available, not requiring glasses, 3D will remain a minority choice within mainstream entertainment and communications. Nearly twenty years ago, Brian Winston's study *Technologies of Seeing*, which offered a theorization of technological change in visual media, concluded with a short chapter entitled "The Case of the Third Dimension."[86] The previous chapter had analyzed in detail how

Fig. 8: Special camera filming for Wim Wenders's dance film Pina *(2010), the first major art-house success in 3D.*

the promise of HDTV had been frustrated over many decades because there was insufficient incentive – and some entrenched disincentives – to carry through this long-awaited improvement on "normal" television. Winston's explanatory model posits two forces at work in all major technological paradigm change: "supervening social necessity" and its antithesis "the 'law' of suppression of radical potential."[87] His survey shows that without pressure from the former, both technological problems and vested interests can and will frustrate what are clearly possible, and attractive, developments. "Given our fundamental addiction to realism," he writes, echoing Bazin, "there is no underlying reason why a true three-dimensional motion picture system should not achieve a cultural fit and be diffused."[88] He accepts that wearing glasses remains an obstacle, but notes that progress with holography, which seems to offer a solution to this, has been slow, lacking the incentive of any felt "social necessity."

Given the fevered rate of contemporary technological research, driven by the immense profitability of systems that achieve wide diffusion, "autostereo" systems do indeed exist, both in niche markets and at the prototype stage for wider consumer use. There are also holographic systems for medical use, offering "natural 3D perception [for] multiple viewers."[89] And Hewlett-Packard's "diffractive optics" research promises 3D displays on mobile phone screens within the fore-

seeable future – on which a scientific commentator on this technology (who has worked on prototype laboratory autostereo), commented: "All that remains is the more nebulous question of whether human beings want or need 3D displays."[90] More nebulous – or more fundamental than the technological solutions now becoming available, and the commercial judgment of those able to "suppress" (in Winston's term) or accelerate them?

The only likely reason for wide acceptance of 3D entertainment, as distinct from such applied fields as medicine and military logistics, is aesthetic: that which pleases or satisfies our sensory judgment. Less than four years into the era of mass-market digital 3D cinema, the most positive aesthetic responses to the experience have probably come from audiences for AVATAR, PINA, TOY STORY 3 (Unkrich, 2010) and HUGO (Scorsese, 2011) and ahandful of smaller-scale successes, such as STREETDANCE 3D (Giwa, Pasquini, 2010). Despite the range of new technical-cum-aesthetic problems that now face filmmakers, it is the widely shared and distinct aesthetic appeal of these pioneering films that has built momentum, amid so many mediocre and crass 3D releases.[91] The most obvious lesson from cinema history is that both recorded sound and color took years to be assimilated into the working practices of filmmakers around the world – the handful of canonic successes that are known today hardly represent what was typical in early sound and color production – so it is unreasonable to expect more than a minority of early 3D films to be aesthetically successful.

But there are perhaps other lessons, or at least hypotheses, from history. The hostility expressed by some of cinema's taste-makers toward sound and color (cf. *Close Up*, cited earlier), and later widescreen, stemmed from a desire to defend what was seen as cinema's hard-won status as "art"; to distance it from the taint of the fairground or amusement park, from novelty or "mere sensation." Something similar is clearly apparent in the demand "what does it add?" or "who needs it?" And underlying this are deep-seated aesthetic positions, involving attitudes toward realism, novelty and "world-building."[92] The history of pictorial and plastic art offers many examples of long-standing prejudices against "colored" rather than monochrome media, most obviously in classical statuary, but also in photography; and against genres such as *bas relief* sculpture, blurring the distinction between three-dimensional sculpture and "flat" image-making, and more generally against such "deceptive" or illusionistic pictorial forms as trompe l'oeil mural and ceiling painting and panoramas, compared with framed pictures. 3D, at least in the early phase of its latest incarnation, challenges the aesthetics of distance and composure, insisting on engagement and potentially immersion. It reasserts the bodily kinesthetic dimension of the cinematic illusion, which film connoisseurship has largely suppressed. Already a sense of 3D's lost history is becoming apparent, not only in the Lumière films from the 1930s, but in two archival discoveries from the 1950s now made viewable as never before on Blu-ray: the Cinerama feature HOW THE WEST WAS WON

(1952), which includes what has been described as John Ford's "masterpiece" THE CIVIL WAR,[93] and Laurence Olivier's VistaVision RICHARD III (1955).[94] These processes were rivals to two-strip 3D in their day, and their restoration allows us to experience something of their original immersive ambitions by means of a large screen and high definition. The return of Hitchcock's DIAL M FOR MURDER, now showable in digital 3D, also reveals this as the first masterpiece of stereoscopic "chamber cinema": controlled, astute and ironic in its play with the new dimensionality on offer.

Many of the recent arguments against 3D cinema – apart from legitimate accusations of studios and exhibitors profiteering, and the low ambition of many films rushed out in the format – seem flimsy, and easily challenged from one's own and others' experience. For those who emphatically do not share Eisenstein's sense of a vast new arena opening up, or of living through what the Polish filmmaker Jerzy Hoffman has called "the third revolution in cinema,"[95] this may be aesthetic preference, or prejudice masquerading as sturdy common sense. However, the future of stereoscopy, alongside other forms of enhanced audiovisual experience such as holography, Virtual Reality and High Dynamic Range imaging, will not be decided finally in the cinema, where only a fraction of total film viewings now take place.[96] We live irreversibly in a multi-platform world where, as Elsaesser has rightly observed, 3D "is changing our sense of temporal and spatial orientation and our embodied relation to data-rich simulated environments."[97] In this sense, its cinema career marks a highly visible "return of the stereoscopic repressed," while a range of other immersive and interactive devices carry us forward into a highly diversified new era of mediation.[98] But 3D digital cinema also offers us, even if only on rare occasions, a unique contemporary experience of the technological sublime.

I am grateful to Grant Weidenfeld for generously giving me access to his translations and to the Bazin Archive at Yale University for the Bazin texts discussed above (http://bazin.commons.yale.edu/index.php). Thanks are also due to Margaux Guillemard and Ondrej Novak for timely help with references and documentation.

Television's Many Technologies: Domesticity, Governmentality, Genealogy

Markus Stauff

Media are inseparable from technology.[1] Yet each medium – or what is culturally identified as such – provokes new ideas about not just what technology actually is but also about what technology's relevance is for all the different media. Television research, in this context, presents an interesting case. On the one hand, technology in the narrower (or, maybe, banal) sense – the hardware, the electrical principals, and so on – has not been granted much attention.[2] On the other hand, research on television actually does offer interesting provocations to existing definitions of technology in film and media studies. This is especially obvious with respect to television's latest transformations, which undermine any clear technical definition of the medium since they comprise both program schedules and individual access through DVD or streaming outlets, as well as both traditional, living-room TV sets and mobile phone applications. To focus on only these developments, however, would simply lead to affirming a banal idea of technology's influence: technological innovations change and challenge the identity of the medium. In contrast, I want to start by focusing on the seemingly more simple television landscape between the 1960s and 1990s, and on "classic" television research. Television research's most relevant contribution to the question of technology in media development, I want to argue, is mainly due to television's domestic character. The day-to-day use of highly complex machinery in ever changing connection with other domestic technologies poses quite different questions than the more public use of technology in cinema and the mobile always-connectedness of digital media. What is at stake here is the intricate relationship between technology as technical system, as material object, as social practice, and as techniques of the body.

In the first part of this chapter, I will show how television research's focus on the medium's domestic setting (supported by television research's excessive opposition to technological determinism) in the 1970s and 1980s helped develop a complex and extended, yet often implicit concept of technology; this is also visible in television research's take on the digital in the 1990s, which is very different

from the film and new media studies debates of the issue. In the second part, I want to suggest certain conceptual tools – dispositif, technologies of governing, genealogy – to give these often under-theorized and under-debated insights a clearer shape (which also somewhat allays the conceptually limiting fear of technological determinism).

Three main insights will be at the core of my argumentation: 1) television urges us to think of media as unstable constellations of technologies including practices and discourses that are no less technological than hardware and software; 2) this technological constellation is characterized by constant transformation, connecting a medium to cultural struggles and strategies of (self-)governing; 3) taking these inspirations from ("traditional") television/television research seriously brings up questions and concepts that are helpful in analyzing the complexities and transformations of current (post-television) media culture.

Who's Afraid of Technological Determinism?

The makers and cultural commentators of early television were eagerly looking for its well-defined specificities that would offer criteria to adapt or translate older media and their forms to the requirements, the potential, and what today is called the affordances of the new medium. More often than not, they looked at the realm of technological features – transmission, liveness, image size – to find solid guidelines for their still developing practices. In this way, debates on television repeated a characteristic gesture familiar from early uses of other technologies and, more generally, artistic practices: the exploration of a new medium's technological characteristic and potential is supposed to deliver inklings of the forms most appropriate to the medium; it should make clear the difference from older media and showcase the full potential (and possibly dangers) of the new one. In a somewhat circular process, the forms developed with respect to these definitions might point out, even invent, new aspects of the medium never thought of before.[3]

However, each definition of the medium's core features is at the very least only a selective "reading" of it, if not an authoritarian one guided by (more or less veiled) commercial and political agendas. Only recently Evgeny Morozov poignantly criticized the widespread idea that "the Internet" – with reference to its technical features – possesses an "inherent nature, a logic, a teleology,"[4] which then is used to naturalize (or as one should say to *technologize*) evolving new concepts of the social, of privacy, of copyright, and the like.

In television research it was mainly Marshall McLuhan's groundbreaking *Understanding Media: The Extensions of Man*[5] that was criticized for such a determinist view of technology. It was this book which most explicitly brought forward the argument that media transform experience and perception in a fundamental manner and that therefore an investigation of media's technological characteris-

tics is of major importance to understanding their social impact. While McLuhan's arguments were shaped by his involvement in researching the educational use of television,[6] his book only became a household name in television research because of repetitive refusal.[7]

First in Raymond Williams's *Television: Technology and Cultural Form* (1974)[8] and subsequently in dozens of introductory books (and surely endless university courses), McLuhan has been accused of technological determinism and of ideological abstraction or formalism.[9] However, the accusation is not entirely appropriate. McLuhan, on the one hand, is quite explicit about media/technologies having a completely different impact on different environments (radio, for example, had very different consequences in Europe than in North America). On the other hand, his work is characterized by a complex and ambivalent notion of media (which in his definition includes traffic and spectacles, light and electricity), as he closely connects their historical development to the human senses and their (im)balance. The accusation of technological determinism insinuates that he reduces all media (and their impact) to technical, material hardware – which he does not.

Maybe even more problematic is the fact that the reproach of technological determinism – according to John Durham Peters – "blocks the path of inquiry."[10] While Morozov's above quoted warning has to be taken seriously, the often knee-jerk opposition to technical arguments is in denial of the always already technical being of humans and society: the fact, for instance, that the techniques of the body and cognitive processes developed in close interrelation with material technologies. Too often in media studies, the human or social *appropriation* of technologies is simply opposed to the technical characteristics of a medium.

The constraining effect of the stereotypical opposition between the "technodeterminist" McLuhan and Williams as the preferred alternative is that there is actually almost no theoretical debate on television's technological characteristics. This blind spot is amplified by the fact that the more technologically oriented fields of media studies – including so-called German media theory – did not show much interest in television. The fifteen pages on television in Friedrich Kittler's *Optical Media* open fewer new perspectives on the cultural impact (or the "technical a priori") of the medium than his texts on the phonograph, film, or the computer.[11]

The surprisingly productive aspect of this prevalent fear of technodeterminism in television research lies in its sometimes explicit but more often implicit reconceptualizations of the relationship between media and technologies – on which I will focus in the first part of this chapter. Williams's already mentioned *Television: Technology and Cultural Form* is surely the most important reference point for this endeavor. In criticizing both technological determinism and what he calls "symptomatic" explanations of technological change, he suggests introducing the idea of "intention" into the analysis of technology. This term, in its basic

sociological understanding, is intended to help see how some of the multiple aspects of a technology are realized because some institutions (e.g., the military) not only have more power but also much more clearly formulated objectives for a technological trajectory than broader civilian technology uses.

Looking through this lens of intention also means that a medium becomes successful – and becomes an institutionally specific technology – because it is involved in broader cultural tensions. The mass medium of television, according to Williams, bridges the gap between increasing mobility and exchange on the one hand and a heightened relevance of the familial private sphere on the other; television thus contributes to what he calls the "mobile privatization" of capitalist culture. Here at least, we can also see a similarity between Williams and McLuhan, who can both be claimed as precursors of more recent ecological approaches to media in that they consider "not only the 'content' but the medium and the cultural matrix within which the particular medium operates."[12] One of the most decisive aspects of television's "ecology," though, is its domestic character, which raises more general questions about the consequences of the domestication of technologies and the interrelation between media technologies and other technologies involved in daily life.

Mobile Privatization and Domestic Technologies

Even early and highly critical approaches to television realized that the technological characteristic of television is very much shaped by the medium's domestic setting. Already in 1953, Theodor W. Adorno tackled television's cultural impact with reference to the size and quality of the image – characteristics which are also of major importance to McLuhan, who goes so far as to say that with improved image quality it just would no longer be television.[13] He could make this statement because McLuhan did not deal with the domestic setting as a decisive factor of the medium. The size of the image or "the physical dimensions of television programs," Adorno insists, "cannot be isolated from the specific context of television, that of home viewing."[14]

The domestic is not just the setting, in which television takes place, rather it has to be conceived of as a particular field of intense intersections of different technologies. From at least the 1970s onwards, what was at stake in television research, was "the need to recognize how 'television' and 'the home' have gradually redefined one another."[15] The domestic modulates both the mediation characteristic to television – its broadcasting mode, the spatially indifferent one-way communication from a center to an anonymous audience – and the character of its mediated "content."

Williams's concept of "mobile privatization" but also his famous notion of program as "flow" highlight not only the fact that television's technology is adapted, "domesticated" into a complex and dynamic setting which modulates

and multiplies the possible effects of television, but also that the technology itself is only constituted in this process. Television consists of many different technological devices, and it is in the process of domestication that these devices are interconnected with other technologies (telephone, refrigerator, and so on) and practices, all of which, as Roger Silverstone made clear,

> provide the basis for a domestic socio-technical system, systematic not necessarily in terms of the formal and technical links between machines, but in terms of the social relations that construct them and define their significance and patterns of use.[16]

The concept of mobile privatization highlights the fact that television, more than any other preceding media, mediates between the public and the private, the national and the familial; it is inextricably defined by spatial dynamics that are not entirely defined by television itself. Broadcasting, while being a quite specific technical characteristic of television (at least before the introduction of video and pay-cable) is a too abstract notion to exclusively understand the space-structuring effects of the medium.

In most Western countries, television acquired its dominant shape from broadcasting and the process of domestication and (sub-)urbanization in a nation-state. Political regulation, economic interests, and cultural frameworks all equip television's entire technological infrastructure and the products that are transmitted with a national bias. Television reaches the people of a nation-state, its program schedule synchronizes the daily patterns of life, and its news programs and spectacular events implicitly or explicitly address audiences as citizens of a nation-state (notwithstanding also addressing them as consumers – for mostly nationally available products).

Williams's concept of flow on the other hand is very explicitly not only a characteristic of the textual structure of television, but also a "characteristic experience" that results from the medium's technological adaptation to the domestic sphere: it can be switched off and on by the individual user – and as soon as it is switched on ("at the flick of a switch" as Williams puts it[17]), something is already going on. "This phenomenon, of planned flow, is then perhaps the defining characteristic of broadcasting, simultaneously as a technology and as a cultural form."[18]

Stating that flow is a defining characteristic of television's *technology* implies that it indeed might be a feature of television that shapes its cultural function independent of (or perhaps even more than) the selection and distribution of "content" across the day-to-day programming (Williams, just as many others, found it striking that people often do not talk about watching a particular program but about "watching television" instead[19]). Furthermore, flow can also be conceived of as a technology in itself, as it is strategically used as an instrument

to intervene into the practices of the audience. Broadcasters dispose of a set of techniques to ensure program flow: continuity announcers, teasers and many more aim at "the grabbing of attention in the early moments; the reiterated promise of exciting things to come, if we stay."[20]

Questioning the relevance of some seemingly basic technical characteristics of a medium, therefore, does not necessarily lead to an ignorant stance toward technology. Rather it forces to ask, how and in which contexts do practices and materialities get a technological shape: How do they become procedures with the capability to structure behavior and with the promise of constant improvement (and the threat of malfunction)?

Domestic Practices and Technologies of Gender

Television became a technology through its strategic, interventionist application in the domestic sphere. On the one hand, television is both in its historical establishment and daily use deeply related to other domestic technologies – here in the sense of machines or gadgets such as the refrigerator or washing machine. It also has become "a key technology for the selling of other technologies."[21] On the other hand (and partly because of that connection), television has become an object of (and is connected with) domestic technologies in the broader sense of structured practices, craftsmanship, and automatized strategies: a great deal of research has shown how television became a tool of intervening in familial relationships – the nearly stereotypical examples being mothers watching sports programs just to spend time with her son or husband, or fathers switching on the TV to avoid the necessity of talking.[22]

Even the basic feature of flow gets its technological efficiency from daily practices and thus becomes a different technology in different domestic settings or for different people within this setting. Tania Modleski has shown how the flow of daytime programs (soaps and commercials) "connects to the work of women in the home"[23] and in fact contributes to and modulates the fragmented and distracted mode of working characteristic of household duties. In the same way as Teresa De Lauretis used the term *technologies* to describe many different sets of social relations that contribute to the differentiation of gender throughout all practices of society,[24] television could be conceived of as being technological not because of (or with reference toward) its hardware, but because of its systematic contribution to the re-organization of (gender) identities and social relations.

Public and private are no natural givens (on which technology has an impact), but a relationship defined by earlier mediation technologies and by the technologies of gender. The difference between public and private is always already a gendered difference, defining unequal distribution of (in)visibility for men and women. Domestic technologies therefore mean something different to men or women while at the same time intervening in the relationship between them.

In television research, the transformation of television's spatial and temporal dynamics through video and satellite was similarly described as an overlapping of the infrastructural scape of these technologies with the other "scapes" (finance, migration and so on)[25] they were connected to. Whatever their technological potential, video did not just become an individualistic medium withdrawn from the public and satellite TV did not create a straightforward global and cultural imperialist form of communication.[26] Rather, they became technologies (and part of television's technological constellation) because they enabled and provoked strategic practices, and because they opened up additional cultural practices (e.g., migration) for intervention and improvement.

The research on "traditional" television – television before the transition to the post-network of the 1990s or the matrix television of the late 2000s[27] – already had to extend the notion of technology to get a grasp on the situated (domestic), dispersed (fridge, car, remote control), and ever-changing (satellite, video) existence of television.

Television became a key example of the "inconspicuous presence of the technical" in everyday life:[28] technology is everywhere, unavoidable, and often not even explicitly identified as technology. This implies that technology, in television research, is at least a twofold and highly ambivalent concept: on the one hand, technology intervenes in everyday life as an abstract and incomprehensible *system*, objectifying and rationalizing practices. On the other hand, domestic technologies also figure as *instruments* that only get their technological shape from the patterned practices *connecting* the different elements and re-organizing the relation between public and private, male and female, work and leisure. The constant transformation so characteristic of television also has to be understood as a result of the interrelation between technical innovations and strategic practices.

Why Digitization Did Not Matter

The ambivalent place and extended notion of technology in television research became especially clear in the (lack of) debate on the digital in the 1990s. In film studies (but also with regard to photography, video art, and other media forms), the upcoming digital technology provoked substantial questioning of the original technology's role in the medium's identity: computer-based, calculated images were considered to be completely different from the photo-chemical and therefore "indexical" image that (notwithstanding animation) defined (the "essence" of) film and photography. Even if one did not opt for an ontological definition of the digital and its difference from the filmic image, the digital at least became the central metaphor in rethinking the multiple technical identities of cinema, even suggesting scholars "to rethink the idea of historical change itself."[29]

In television research, the computer and digital technology, in the 1990s, were occasionally discussed as complete opposites of television that might eventually replace it in the future: we would become users instead of audiences, individual choice would rule over mass consumption, and so on. And surely the digital became productive as a prism that allowed for a closer look at several allegedly characteristic features of television, begging the question: Does the broadcasting mode of television – its powerful combination of centripetal and centrifugal cultural dynamics[30] – depend on its technical setup, or is it a cultural form that will be continued (if in a different manner) under digital conditions?[31]

Nevertheless, the digital (as a question of technology) remained marginal. This can partly be ascribed to technological reasons: the television image's grid of pixels always already did have a certain digital aspect (even if the color and brightness of the distinct pixels were not digitally determined but defined by continuously, analog changes). Furthermore, digital technology was successively introduced both to television production and to domestic television sets long before the switch to digital transmission "completed" the digitization of television.

The aesthetics of the television image (and its addressing of the viewer) had already been changed very fundamentally before this completion and only partly because of the introduction of digital technologies – television industry (at least in the US) pre-mediated its digitization through a bundle of strategies. John Caldwell very comprehensively analyzed how the dominant zero-degree style of most television coverage, starting from the 1980s, was replaced by a broad palette of distinctive looks (or "stylizations" as he prefers to call it) that partly imitated the production values of Hollywood films and partly displayed a videographic "hypermediality."[32]

The televisual image was reinvented as a tool to give programs and networks an identity, to break the continuity of program flows, to attract certain audiences and to become discussed in its visual qualities. This was made possible by different technical innovations, such as non-linear editing, motion control, and digital graphics, yet it was also based on new economic strategies (addressing target audiences), on an exchange of workforce and technology between film and television, and especially on an intensified theorization of the image in the production process. Caldwell explicitly pleads for an interventionist notion of technology, pointing out that political and industrial forces constantly evaluate and regulate the use and the qualities of certain technologies.[33]

Televisual technology though, in this account, comprises a much larger (and more ambivalent) terrain than just the machines used for image production; rather, television's technological impact becomes truly obvious in the strategic aims and effects of the stylization, one example being the "industrial reconfiguration of the audience, in the name of cultural diversification," which "helped spawn the need for cultural- and ethnic-specific styles and looks."[34]

This then also allows putting aspects of the digital beyond the visual quality of the image into perspective which became relevant in the 2000s. The landscape of content distribution and audience practices may have changed through those technological innovations that make television programs accessible on/through quite different machines and gadgets (through telephone cable and a game console, on a mobile screen, and so on), but this transition to the digital is strategically regulated (made possible but also constrained) by techniques of programming and of audience creation that are taken from "traditional" television and gradually adapted to this new landscape:

> Successful multimedia development, therefore, means being able to track, monitor, and predict – or at least respond quickly to – multidirectional user flows and migrations. As a result, digital programmers must develop new units of temporal-user management.[35]

Innovative aesthetics and technologies (gadgets or online tools, for instance) often figure as strategic entities, organizing the connection and combination of different industrial players and the adaptation and reformulation of techniques (in terms of strategies of intervention). What they are capable of doing "technologically" might not be as important as what they achieve as symbols of innovation, progress, and "the next big thing."

There are of course aspects and layers of digital technology that might not sufficiently be taken into account by such an approach: the power of algorithms and protocols, questions of digital methods and big data.[36] Television research, however, clearly shows that each approach of technology that locates the technological in one well-defined principle (the structure of one piece of hardware or the rules that make up a piece of software, for instance) tends to miss the many technologies that make up a medium. Strategies of scheduling and classifications of audiences are no less technological than hardware/software (or the remote control for that matter) – they offer tools for managing a particular field and enable constant and systematic improvement. Each new medium's technological characteristics include (and are partly defined by) these kinds of discursive and practical layers.

Both the production process and the domestic reception of television therefore consist of heterogeneous bundles of gadgets and practices that only in their interrelation become technologies. They become machineries that define a field of intervention, of improvement, and of agency. In the second part of this chapter, I will connect these insights to more established conceptualizations of media technology.

Technological Heterogeneity: Apparatus/Dispositif

For a long time, the focus on the relationship between (ideologically structured) texts and their (sub-culturally, domestically structured) reception dominated discussions in television research. The research's perspective on technology was shaped by this paradigm, countering the much-feared technological determinism by insisting on the varied and socially embedded "actual" adaptation of technology. However, as I hope to have shown, a sensitivity to both the domestic setting of television and to television industry's articulation of the digital provoked an extended notion of technology – a notion which undermines any clear dichotomy between technology on one side and humans/practices on the other. The practices of consumers and producers are technological – not least because they are formed in connection with gadgets, infrastructures, and buttons to push; the gadgets and buttons become technological by their embedding in already technologized contexts and patterned practices.

These insights, however, are somehow buried at the margins of television research due to its ambivalent attitude toward technology and its focus on questions of representation and reception. To more consistently take inspirations from television to the more general debate on technology and to overcome the still looming dichotomy of technology vs. social adaptation, I want to give television studies' often implicit extended concept of technology some more explicit theoretical leverage.

Considering the close relation between practices and gadgets/infrastructures in the above descriptions, one might take advantage of actor-network theory's insight that both society and the technological systems lending durability to society consist of networks that include human and non-human elements (or "actants" as this theory would have it). In short, object relations and social relations are inseparable.[37] These networks are always fragile, as each new actant that enters or leaves the network changes the entire configuration. Television, that is, becomes a different medium when used with a remote control; it also becomes a different medium when it is watched in a post-traditional family setting. However, the relation between the remote control or the post-traditional family and (the other elements of) television is not a given, but something that always will have to be renegotiated or "translated."[38]

The concept I want to focus on, however, is the one of apparatus/dispositif. Much more explicit than actor-network, this deals with questions of power, which have been at the center of the bigger part of television research; furthermore, the concept addresses how constant transformation – so characteristic of television – contributes to its technological aspects.[39]

While there are some approaches which have taken advantage of this concept to understand the technologies of television,[40] any prior use of the term *dispositif* (or rather "apparatus," the often-used English translation for the French term) in

film theory of the 1970s very much confined its applicability to television. The term aimed to explain the ideological effects of the medium film/cinema (and not of single films) by taking into account the entire configuration that allegedly defines the cinema experience: the camera with its unavoidable central perspective, the movie theater immobilizing the spectators in a dark room with the projector in their back, and the distant screen with its dreamlike images edited into a continuous flow of actions and reactions.[41]

While technology, here, is conceived of as a complex constellation, the cinematic dispositif receives its ideological efficiency from the stability of this overall constellation transfixing the human body. In Jean-Louis Baudry's seminal text, Plato's cave is the decisive point of reference;[42] in subsequent media studies research, the panopticon – Bentham's model for a prison as analyzed by Michel Foucault – partly replaced the cave metaphor. Both models highlight an asymmetric visibility and the effects of a materially, architecturally fixed topology – a machinery of power and subjectivity that does not need human intervention to keep on working.

On the one hand, television can productively be contrasted to the cinematic dispositif point by point: it is mostly watched in a lighted room; viewers remain mobile and might be distracted; and the texts of television being much more fragmented, mixing documentary and fictional, or live and recorded images. Such a comparison leads to the conclusion that the experience of television is much less defined by a concentrated gaze than by distracted glancing and therefore also less defined by processes of identification than by empathy or casual judgments.[43]

This comparison also questions the viability of the apparatus/dispositif approach for television research as it highlights the flexibility and heterogeneity of television. The discussion on domestic technologies, however, is eventually much closer to Foucault's definition of the dispositif than the use of the concepts apparatus/dispositif in cinema studies ever was: he describes it as "a thoroughly heterogeneous ensemble consisting of discourses, institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements, philosophical, moral and philanthropic propositions – in short, the said as much as the unsaid."[44] A more thorough consideration of this definition of the dispositif could actually have helped overcome some of the binaries structuring the debates on television – especially reception research's fruitless oppositions between textual structures and "actual" use, or between "active" and "passive" reception.

Foucault's deployment concept in his *The History of Sexuality* made clear that not one stable setup (of the confessional box, for example) forms a dispositif but a changing set of tools, institutions and individual self-guidance, which all can be considered "technological" and thus on the same level as machines, infrastructures, and discourses.[45] The dispositif is not identified as one visible or co-

herent entity (contrary to what often comes to mind when we speak of "panopticon" or of "television") but as an ensemble that receives its coherence from the effects it produces. Television might thus be analyzed as being or establishing a dispositif, but it also has to be analyzed as an element of a larger, more abstract dispositif (what Deleuze calls a "diagram") – e.g., mobile privatization.[46] That a dispositif is never perfectly congruent with one medium makes it such an interesting concept for the analysis of media technologies, as it opens up the question of which kinds of technologies are taken up and transformed by the unstable constellation we call television.[47] The concept forces television research to get a better grip on how practices and materialities become technologies in a certain, conjunctural constellation.

These questions did eventually get more explicit in television research when, starting in the late 1990s, Foucault's later work on governmentality was taken up. In this context, finally, a more explicit discussion on technology unfolds.

Television's Constant Transition: Technologies of Governing

With the concept of governmentality, the historical development of technologies of governing is brought into focus. Compared to the notion of the dispositif, both institutional frameworks (especially the actions of a government or a state) and individual practices are much more explicitly taken into account as operational elements of power technologies. Furthermore, the indirect and situation-based effects of technologies are articulated much clearer, which makes an application of the concept to television especially pertinent: contrary to film (and the panopticon for that matter) television's basic fact of transmission necessarily separates the viewers not only from the site of image production, but also from the "co-presence of subjects contained within a field of the gaze"[48] – any direct control of the viewer is thus barred. The entire regime of mobile privatization is less based on the panopticon's "visible display of force," but rather on "the values of individualism and hedonistic pleasure, as well as desires for social recognition and dreams of community."[49] This might also be the reason why governmentality studies (in contrast to the apparatus/dispositif concept) was earlier and more intensively taken up in television than in film studies.[50]

Governing, in Foucault's sense, encompasses all manner of strategies aiming to structure the behavior of both people and things; these strategies, however, do not restrict or dictate, but rather take the inner dynamics of the governed entities into account and thus create a milieu that structures the field of possible behavior.[51] Technologies of governing are the constellations of techniques, institutions, and procedures that make it possible to gain knowledge about the entities in question and to establish "rational" modes of intervention, which rather enact a "governing at a distance" or a "conduct of conduct" than direct physical discipline.[52] Part of this complex are so-called technologies of the self, meaning a

complex of discourses, tools, and practices that allow (and incite) individuals to systematically modify their own behavior.

To call this technological is more than just a metaphorical way of speaking. Technology here means that a specific rationality is established that defines a field of intervention and structures possible, alternative strategies of intervention. It also underlines that technology is not only defined by its capacity to intervene into such a field to structure or to improve behavior, but also by the very possibility to change, to improve the technology itself. The "improvability" of technology does not consist in linear progress, but rather in the constant reaction to conjunctural-defined problems, so-called "problematizations."

In television studies, this perspective was taken up in many ways. Most prominently, technologies of governing have been identified in the genre of reality TV, which not only displays examples of self-improvement, but also acts very much as "life intervention"[53] and thereby contributes to a broader reinvention of government in which former public institutions are privatized or delegated to self-responsibility. Commercial television, often in close cooperation with expertise from the corporate and business sectors, proliferates "the everyday techniques through which individuals and populations are expected to reflect upon, work on and organize their lives and themselves as an implicit condition of their citizenship."[54]

Seen from a broader perspective, the entire institutional and technological development of television is very much shaped – and in a sense "technologized" – by the question of governing. Dependent on the different kinds of television regimes (e.g., state controlled or commercial), this question was formulated in different ways. However, from its inception, television in most countries was conceived of as a medium that could reach the entire population and thus could possibly contribute to improving the people's conduct, be it as citizens or consumers. The placement of the medium in the domestic setting made it into a technology of governing that was feared and desired even more. In ways that are not that different from sexuality as analyzed by Foucault, television guarantees access to the family's private behavior and through that affects the entire population.

For the case of US television, Anna McCarthy has shown how from the very beginning, TV stations and sponsors were busy trying to find out as much as they could about their audience, classifying its different groups and producing knowledge about their tastes and reactions. Television thus allowed some people/institutions to define themselves as "elite" and thus entitled (and obligated) to "guide" the population.[55] This guidance, however, is not plainly given by inherent technological features of television; rather, the desire to govern through television incites constant transformations of the program schedule, of content, of policy regulation, and of paratexts advising the audience how to appropriately use the medium to society's – and their own – advantage. Television is "technologized" by equipping it (or some of its heterogeneous elements) with interven-

tionist potential and with rationales for transformation and improvement. In this process, the medium is simultaneously considered to be a problem (for family life, for education, for citizenship) and an instrument to deal with these problems.[56] Through the endeavors to govern, television is established as a topology of things and people – a milieu – that allows for a systematic reflection on, and intervention in, the behavior of populations, (target) groups, and identities which are themselves co-constituted through these procedures of knowledge production.

Often (as in the film theoretical discussion of the dispositif) technology is discussed in terms of its rigidity, a matter of materially or procedurally determining what can be done and what cannot. It might actually be one of the most important gains from studying television as a technology of governing to question this idea: It is not the stable (technological) constellation that characterizes television's power effects, but the constant transformation that point to and identify certain audiences and behaviors in need of transformation. The improvability of "content," of image quality and of individual access to television contribute to television's character as technology of governing just as much as the improvability of children's knowledge about commercials and parents knowledge about the appropriate "content" for their children.

With its constantly new formats and schedules, however, with the continuous connection to quite fundamental technological add-ons (cable, satellite, video, DVD, and so on), television was a forerunner to the permanent state of transition we find ourselves in in present-day gadget – and update – culture. But how to analyze technology if it is obviously less defined by setting binding standards than by constantly introducing new ones? Here, the concept of technologies of governing allows us to describe the transformation patterns themselves as technological processes: the technological, then, does not lie in the distinct constellations before and after the transformation – as if television before the VCR would have been a different dispositif from television after the VCR. Rather, the technological can be located in the multiple rationalities structuring the process of transition: the incitement toward more individuality, the effort to get more "control" over domestic life,[57] the problem of how to adapt techniques of the body to the techniques of remote controls, and so on. Television's governing potential, thus, is based on many different, alternative strategic interventions in individual and social, domestic and national issues.

Beyond Archaeology: Genealogy of the Televisual

Finally, this constant transformation of television and its domestic setting inspires a certain re-adjustment of the historical approaches to technology. In place of the archaeology-inspired cinema and digital media histories, television research tends toward a more genealogical approach. Again, this methodological

debate remains implicit in most television history writing (and the opposition between archaeology and genealogy is far from clear[58]), but we might gain from a more explicit profiling of its alternative approaches.

The concept of archaeology became important in film studies and in media studies, especially in German media theory, in a number of ways. Getting inspiration from various backgrounds (in their overview, Huhtamo and Parikka mention Walter Benjamin, Siegfried Giedion, McLuhan, and others[59]), the most explicit reference point is Foucault's archaeological method, which aims at an alternative history, one not looking for origins and developments but for historical ruptures and "conditions of existence."[60]

Instead of focusing on the genius of inventors, a linear dynamic of progress, and a successive enfolding of *the* ontology of a medium, an archaeological approach would ask: What are the historical formations (the structures of historical knowledge and practices) that make a particular invention possible and useful, and that define its historical ontology? But it would then also ask: How did a technological constellation contribute to the historically specific rules that guide the production of knowledge and subjectivity? The second question, quite clearly, goes far beyond the history of a single medium and Bernhard Siegert, more generally, warned that any appropriation of "archaeology" to write an alternative history of media rehistoricizes and belittles the term.[61]

The first question, however, is more closely adaptable to the history of a single medium and it provokes a constant re-conceptualization of its coherence and identity. Thomas Elsaesser, for instance, argued for such an archaeologically inspired film history that would switch back and forth between the present and the past. Recent developments (digital 3D, digital projection and distribution, and so on), which are too easily conceived of as challenges to the identity of cinema, can better be used to re-discover already forgotten sideways and seemingly obscure aspects of the medium's history; archaeological findings (abandoned technologies, formal aberrations, etc.) can thus force us to include aspects in film history which have long been excluded by the dominance of the narrative feature film.[62]

In contrast, historical television research, which got a boost in the early 1990s, can be described as being genealogical, since it focuses less on synchronic formations than on a diachronic series of struggles that develop around technologies while at the same time transforming them. The notion of power, which is here to be understood not as the power of one specific technology, but as a matrix of power which rests on, produces, and transforms technology, is very present in these genealogies of television. They aim to tell a history of the present in which the well established and naturalized building blocks of television – think "audience," "household," "information/entertainment" – are analyzed in their contingent, heterogeneous, and contested pre-conditions. Where an archaeological approach mainly aims to enable new perspectives, the genealogical approach

aims for a critical assessment of the turning points which gave technologies a certain shape and excluded possible alternatives.

The production of the domestic sphere (a precondition for television as we know it) involved a redistribution of public and private and of male and female spaces – as it was connected to programs of suburbanization, cheap mortgages, and the establishment of the nuclear family.[63] The audience, a concept now considered a key element of television, just as new media seem to have replaced it with the "user," is not a given of television either; genealogical research has focused on the constant struggle to produce and quantify audiences,[64] to address and educate them.[65]

As noted, the research I refer to here does not necessarily describe itself as genealogical. I am using this label firstly to mark a certain distinction from the more prominent approach (or, better, different approaches) of media archaeology and its interest in surprising findings and moments of rupture. Secondly, the label allows me to point out the broad and partly ambivalent role that technology has in historical research on television as a medium in transition. Television technology, even in its more narrow meaning, has constantly changed. In the 1960s, at least in the US, the VCR was being discussed as a means for improving the medium of television – however, this was heavily contested, as this improvement could either consist in selling or renting out high-culture on tape with the intent to replace the dominant TV fare or in offering more individualized access to the regular TV programs.[66] As in most other struggles defining television's transition, the shape and use of machines may have been what was at stake in these debates, but they also transformed television – and its different technological developments – into technical metaphors for the entire society:

> [T]elevision continues to be a central medium not just for entertainment or information, but also for speculations about the present state of gender roles, family life, race relations, international conflict, and the general prospects for art in media culture.[67]

The genealogical view of technology avoids any clear-cut distinction between the discourses on technology and the technologies themselves (contrary to Kittler's explicit claim that discourse is no longer an appropriate level of media analysis[68]); it shows that the medium of television is in permanent crisis and it is this crisis that makes it technologically, metaphorically, and culturally into a powerful medium. While archaeological research aims at showing that, from hindsight, a technology could also be seen in a different perspective, genealogical research shows that technologies always already were seen, used, and defined from different perspectives: they exist and function because of the competing concepts and strategies.

For the present, the genealogical approach furthermore allows us to avoid a similarly clear-cut distinction between television and other (digital, new, social) media. If the digital image was considered a turning point in film history, the mobility of digital media could be conceived of as a similar challenge to television; after all, the domestic medium, however heterogeneous it might have been, was organized around the television set placed in one, or several, rooms of the static domestic space. Yet more recent research has shown that questions of, first, portability and, later, mobility already accompanied some of television's historical transformations – and different forms of mobile technologies have since re-defined the "essence" of television.[69] This also allows us to discuss which material technologies (machines, gadgets), discursive technologies (promises, classifications), and practical technologies (body practices, social relationships) that define the field of mobile media are taken up from the context of television, and which are abandoned, re-invented, or re-mediatized. Television's genealogy thus provides insight into technologies and the power relations making them possible, which might be overlooked by only focusing on the specificities of the new digital, social media.

Conclusion: Toward Post-Televisual Technologies

When in May 2013 Microsoft presented its new video game console, the Xbox One, this – once again – was presented as a conspicuously hybrid or convergent piece of technology: it not only includes a Blu-ray disc drive and supports the presumably next-generation flatscreen's 4K resolution, it also offers recording functionality (if only for recording game play), and can partly function as television set-top box offering an electronic program guide for navigating television shows. It therefore figures as yet another example of digital media's fantasy of unification, the promise to bring formerly separated media functions together in one coherent interface[70] (and with only one remote control) – while in fact only contributing to the ongoing multiplication of standards, gadgets, points of access, modes of use, and so on. For some it also proves that television, after being declared dead more than once, is persistent and will become an economically and technically important node of digital culture. Technologically, however, it is ever more uncertain just what television is and where/how one can identify it.

As already stated at the beginning of this chapter, a closer look at the domestic incarnation of television delivers conceptual tools that also allow to get a better grip on the most recent transformations of television. The extended notion of technology and its theoretical sharpening through the concepts of dispositif, governmentality, and genealogy does surely not ignore the dramatic consequences of digital and social media. However, instead of taking the technological features of the digital (and its impact on television) for granted, this extended notion locates the *technological* aspect of media in the constantly transforming

connections between its heterogeneous elements. This ensemble of gadgets, infrastructures, discourses and practices becomes technology through enabling strategic interventions, improvability and knowledge production.

Television never was anything but a constellation of heterogeneous technologies and respective problematizations that structured the application and transformation of these technologies that react to and intervene in contested cultural fields. Neither the problematizations, nor the multiple technologies characterizing a certain moment of television necessarily have a common trajectory. Some of them survive and come to new life in a re-organized media constellation. The question is less whether television will die or persist, but which televisual technologies (and problematizations) are taken up by what comes next and will thus still shape media culture. Lisa Parks summarized this very well:

> A convergent approach to television involves keeping the meanings of the technology dynamic and malleable, open to being mobilized and used in different directions, across languages and disciplines, and in unpredictable ways. It also involves rewriting our critical terms and keeping them useful as television combines with and is altered by new technologies.[71]

Additionally, television's constant transition suggests that any technology (and this is even more true of a medium combining quite a number of technologies) gets at least part of its cultural impact not from what it is and what it does (reliably, repetitive, hidden from the surface), but from how it changes and can be changed.

Postmodern Hi-fi vs. Post-Cool Lo-fi: An Epistemological War

Laurent Jullier

For every narrative cinema challenge there are at least two solutions: one involving costly techniques, and one involving only a single camera. If a contemporary director reads in a synopsis "then our main character is fighting in Austerlitz, among troops of 200,000 men," she or he can hire armies of 3D compositors and match move artists to design the battle, or find a narrative or visual idea to avoid the screening of the whole battlefield. Let us imagine an ideal situation and take for granted that the choice is not a matter of money but a matter of art, and call the first solution "hi-fi" and the second one "lo-fi." One already knows "fi" stands for fidelity, but which kind of fidelity? A cartographic fidelity, i.e., a *bird-view* of the event. Scores of digital designers will authorize large establishing shots of the battlefield, as if we are birds flying over the madness going on below – see the STAR WARS or the LORD OF THE RINGS film series. The hi-fi choice then means an *exocentric* type of encoding environment data. It allows a kind of disembodied experience in order to embrace the wholeness of a scene. All details must be calculated, since the hi-fi choice has to "impartially" show the world "as it is," not as it is seen.[1] High resolution domestic displays, 48 FPS shooting and 3D glasses, among other technological inventions, run for the same team. On the other hand, the lo-fi choice will probably mean an *egocentric* type of encoding environment data,[2] where we will be thrown at the heart of the battle, briefly seeing three or four other fighters. Smoke, blasts and run-and-gun style[3] will forbid any clear gaze on what happens, while fast cutting and numerous close-up shots will provide disconnected samples of the event.

Now we have our two competitors: on the left, hi-fi exocentric computer-generated imagery; on the right, lo-fi egocentric hand-held cameras, both having the same purpose: describing a scene with the most possible accuracy. As suggested by the title of this chapter, this is an epistemological war which gives rise to the question: "How can I know, as a spectator of a fictional narrative, what a Napoleonian battle was like?" Answering this question, i.e., trying to provide some reliable (or at least believable) knowledge, even if the spectator only intends to have fun watching a good movie, supposes at least two antagonistic technologi-

cal means. The aim of this essay is to establish the extent to which these means differ when considering the kind of effects they produce on the spectator.

Hi-fi: From Keplerian Replicas to Vasarian Substitutes

First of all, the dichotomy "hi-fi vs. lo-fi" reflects a culturally biased terminological pick, coming from the northwestern European tradition. During the 17th century, according to Svetlana Alpers, there were two different ways for a painted image to describe the world: the cartographic eye of the Dutch masters, who provide lens-like Keplerian images as replicas of the world, and the narrativist, self-interpretative way of the Italian masters, who provide window-like Vasarian images as substitutes for the world.[4] Then, for many reasons, the dichotomy "hi-fi vs. lo-fi" appointed the cartographic fidelity of the birdview as a touchstone to the former, while implying that the hand-held shaky camera provided so-called *low*-fidelity shots, which reflected the wedging of our senses and provided a knowledge which was located to a single point. Now imagine the touchstone no longer entails the disembodied mapping of the event but the embodied feeling to *live* this event. No human being can fly as an eagle over the battlefield, scanning and storing visual data as a machine, but computer-generated imagery (CGI) sure can make you feel you can. In this new linguistic setup, the computer-generated imagery should be called *lo*-fi, and the run-and-gun style *hi*-fi, since it manages to put us onto the battlefield, assuming fear and distress prevent our reason to manage any rational data treatment. Then, the hierarchy associating hi-fi with computer-generated imagery does not value "realism" but "photorealism." A calculated scene does not "objectively" inscribe itself on the screen: to deserve such a reputation and give all the scientific guarantees of optical truthfulness, it should rather consist in raw data, i.e., columns of numbers and measures. Instead of these numbers which probably could give one a good idea of what "the world as if nobody was here to watch it"[5] is like; what spectators see on the screen looks exactly like a *photograph* or a *shot* of the scene, including the distortions and errors usually induced by an average camera. It is easy to understand this "irrational" preference (irrational from a scientific point of view) when comparing the first and the third installments of the TOY STORY franchise.

The main proof of the exocentric quality of a computer-generated visual scene is the freedom for the artist to choose the point of view *after* the modelization is achieved by the machine. Here we have the opportunity to bridge the gap between painting and sculpture: imagine Leonardo storing all the visual data concerning Mona Lisa, including her back and her legs, then deciding at the last minute: "Let's capture her with a simple classical medium close-up, and store the complete data, in case the audience asks for a sequel." To fight the methodical calculating side of this attitude toward representation, directors make extensive use of hypnotic and vertiginous crane moves, mainly track-in shots

Fig. 1. Left: Toy Story (John Lasseter, 1995). Behind Woody, all background details are in sharp focus in the depth of field. Each white bar of the bed is clear-cut, for example, even the ones far off. Right: Toy Story 3 (Lee Unkrich, 2010). Behind Woody, this time, background details are blurred, due to the shallow focus. In 1995 the address to the spectator was: "Hey, look at how we calculated every single detail as is!"; fifteen years later, it became "Please concentrate on what Woody has in mind (and remember that shallow focus suggests psychological introspection, since a character appears oblivious to the world around her/him"[1]).

associated with wide-angle lenses, allowing to do what the human body cannot (such as soaring or flying). These fluid movements "enroll" the spectator in spite of the fact the screen in front of him/her shows no strong epistemological boundaries between diegesis-related pixels and production-related pixels.[6] The editing is in line with the use of this technique, providing numerous action-match cuts without continuity – a characteristic trait of music video effects: the movement of a figure in shot A will be completed by that of another figure in shot B (classical cinema mostly refused this type of practice which, by underlining the plastic qualities of the figures onscreen, ran the risk of preventing the spectator from seeing them as traces, which would have endangered the reality effect so dear to classical cinema). Synaesthetic music video effects, which have a direct influence on the body – based on binary metronome beat music, rich in low frequencies and, if possible, broadcast very loudly – eventually bring some help. Here the soundtrack has the upper hand on the visuals, imposing its law on picture editing (whereas in classic cinema the very opposite happened – as in circuses where the orchestra has to adapt to what was happening on stage, the music had to conform to the picture).

In this aesthetic and technological frame of the music video effect, "communication" (as the conveying of descriptive information) is substituted by "communion" (as harmony and attunement with the data).[7] Audiovisual fluency rocks and rolls us into a pleasant state of mind, even when the time comes to make moral evaluations on what happens in the diegesis – "high fluency is associated with positive affect and results in more favorable evaluations."[8] Maybe it even *equips* us to cope with the representation of harsh events on the screen. "Tradi-

tionally, psychologists studying evaluations viewed them as resulting from the slow and careful consideration and integration of relevant stimulus attributes. In contrast, recent psychological research suggests that evaluative judgments are often formed without such considerations, for example, by consulting one's apparent affective response to the stimulus."[9] Therefore the role technology plays in ethics, when considering CGI "cool" exocentric and fluent representations, is to induce a Nietzschean or dandy moral point of view, centered on the aesthetic apprehension of the spectacle. Compare for instance two versions of this tragically narrative episode: a young man fails to come back home in time to prevent his aunt and uncle, who raised him since his infancy, being savagely murdered by barbarians. This scenario takes place in THE SEARCHERS (John Ford, 1956) as well as in STAR WARS (George Lucas, 1977). In the former, neither the desperate journey home nor the hideously wounded and burned corpses of the boy's relatives are shown, and Max Steiner uses dissonant chords to score the scene. In the latter, we follow the boy driving his speeder (this machine glides over the ground: perfect for fluency, not to mention Lucas is fond of wipes – transition effects which give the editing work more fluency), then watch him discover the bodies while the pleasurable chords of John Williams's score accompany the scene.

Lo-fi: Justifying the Alterations

On the so-called lo-fi side things are quite different. A reflexive device seems to have been borrowed from literature: the false document. From Miguel de Cervantes's *Don Quixote* to Jean-Paul Sartre's *La Nausée*, not to mention *Robinson Crusoe* or *Dracula*, thousands of novels used it, usually asserting in their first pages that the author "found" (instead of "wrote") the very text we are about to read. THE BLAIR WITCH PROJECT (Eduardo Sánchez & Daniel Myrick, 1999) remains a famous example of how a lo-fi movie can benefit from using the false document device. What appears on the screen when the narrative begins is presented as "all that remains" of the footage shot by three student filmmakers who disappeared while filming a documentary in Maryland about a local legend known as "Blair Witch." As soon as we take this "truth" for granted, we indulge in the poor non-broadcast quality of the images because that is all we have. We even *welcome* technical mistakes, since if (1) "to err is human" and if (2) a real human being is supposed to have made these images, then (1+2) these images *must* display errors. Indeed the capacity to be believed, "far from being undermined, is much rather confirmed by the reader's customary expectation that self-representation always involves a measure of misrepresentation."[10] This kind of lo-fi apparatus adds a second apparatus to the hi-fi one: we are not supposed to believe the (unmediated) presented world, but rather the (mediated) presented world to be part of a real world. Home-movie film look, mobile phone-recorded shots, single

Fig. 2: [REC] (Jaume Balagueró & Paco Plaza, 2007) displays the same kind of apparatus as in Blair Witch. *Television reporter Ángela and her cameraman Pablo are following firemen and policemen in Barcelona, until everybody is locked up in a deadly building full of infected demonic creatures. Left: Ángela asks Pablo to "tape everything"; meanwhile, her face, blurred due to the motion induced by the shaky cam, looks like some Francis Bacon painting. But we understand this technical failure as a proof of humanness. Right: The diegetized operator interferes with the main action, "testifying" to the validity of his images: "Get out of the way!" yells the fireman to him, i.e., to us.*

microphone poor sound, etc., are all the more true because in the real world we are accustomed to link their presence to truth, from Rodney King's beating to the 9/11 attacks. To bring back memories from his honeymoon, Shrek, the eponymous character of Shrek 2 (Andrew Adamson, 2004), films the event with a Super-8 camera, the very same tool with which Abraham Zapruder recorded the assassination of JFK: how could we refuse, at least in the first place, to "believe" the validity of the clumsy and scratched shots of him and Princess Fiona?

The lo-fi apparatus is not limited to the "false document" taped by a diegetized operator. Numerous movies, especially when it comes down to action sequences, allow the operator to become a visible and unblinking witness in order to express her/his emotions by moving the camera in a non-broadcast way. Maybe the starting point of such a habit was given by the universal success of a device that turned into a *cliché*; the shaking of the camera caused by the T-rex when he brushes past "us" in Steven Spielberg's Jurassic Park (1993). Indeed he is supposed to be so heavy the earth trembles – this lo-fi device can be seen as the desire of the CGI crew to give some weight to their hi-fi but immaterial creation (the T-rex weighs nothing, since he is made from 0 and 1s). Nowadays, neither car chase nor fighting sequence comes without its lo-fi shaky shots, even if the sequence is not presented as found footage or live broadcasting. This lo-fi device can even be found in films that depict a time when the camera was not yet invented. From Dances with Wolves's buffalo-hunting Dutch-angle shots (Kevin Kostner, 1990) to Robin Hood's run-and-gun style fights (Ridley Scott, 2010), numerous examples can be found. But do not forget that these alterations must be diegetically justified, except for when the audience is looking for a

modernist Brechtian movie. For instance, spectators who only went to see RACHEL GETTING MARRIED in 2008 because it had been directed by Jonathan Demme, and expected the same mainstream narrative and forms as his well-known success SILENCE OF THE LAMBS (1991) offered, were definitely thrown off balance by the use of its lo-fi apparatus, which they failed to link to either the operator or the characters in the film. In this respect, casting a glance over a single page of IMDb user reviews of this film will be clarifying:

> A great performance by Anne Hathaway and a good story gets lost inside a horribly shot and edited film. Way too many "why did they do this" questions, way too many overly long scenes, and quite possibly the worst use of hand held camera technology in recent memory. (*Rachel Gets Married, Audience Gets Headache*, 11 Oct. 2008, by Ira Sez from the United States)

> When I was an engineer and again as a programmer, we had a saying, "Just because you can do something doesn't mean you have to do it." Last week I saw W. and had the same comment about it. The hand held, shaky, up your actor's nose close-ups all distract from what could be an interesting story. How I miss the carefully plotted camera work of people like Gregg Toland (THE GRAPES OF WRATH and had the same comment about it. The hand held, shaky, up your actor's nose close-ups all distract from what could be an interesting story. How I miss the carefully plotted camera work of people like Gregg Toland (THE GRAPES OF WRATH and CITIZEN KANE). (*An Old Curmudgeon's View*, 25 Oct. 2008, by Al Weiss from the United States)

> Ten minutes into watching this movie I was thinking: how much longer will this last? This film sort of reminded me of the time my neighbor brought their daughter's wedding video over and, to my wife's embarrassment, I fast forwarded thru the ceremony, in front of them. (*Calling a Spade a Spade*, 30 Nov. 2008, by mrblimp from the United States)[11]

These IMDb reviewers convey their inability to enter the diegetic world in spite of a true desire to be absorbed. They were unable to worry or to feel happy for characters – which obviously for them is the common way of "using" film narratives – because the lo-fi apparatus puts some inappropriate distance between the two sides. Only an audience well-versed in the *Verfremdungseffekt* could feel comfortable with it.

From Absorption to Experience

Aside from these communication problems – these IMDb reviewers of RACHEL GETTING MARRIED should ideally have been warned or should have been look-

ing for further information about the film's style – the intermedial import of the lo-fi apparatus into the mainstream style nonetheless is a hit. For the sake of argument, let us put the extensive use of the shaky camera as part of what one could call the *post-cool* style, since it is a testament to the desire to *believe again* as opposed to keeping an ironic "dandy" gaze on what is shown on the screen,[12] while the extensive use of CGI remains as part of the original postmodern style. The table below summarizes a few characteristics of these styles by basically comparing it to both the Hollywood Golden Age "classical" style and the European "modern" cinema of the 1960s. Of course these four categories are just convenient labels used nowadays to signify the collective presence of formal figures, the seeds of which were already mostly present in films dating back to the early years of cinema.[13]

		CLASSICAL	MODERN	POSTMODERN	POSTCOOL
Ethics and ideology	**Overall project**	Lesson	Criticism	Cool moment	Lively moment
	Requested kind of spectatorship	Absorption	Distance	Enrolment	Experience
	Expected use	(Distracted) learning	Critical reflection allowed by ostranenie	Resonance and vibration	Self-conscious commitment
Tech nolo gy	**Relation of images to the world**	Images as mirrors or lenses	Images as images	Images of images (quotations or photorealist CGI)	Images of images as mirrors (feigned found-footage)
	Typical shots	Basic classical "grammar" of the so-called "transparency"	Zoom and telephoto shots, "caméra-épaule"*	Vertiginous track-in, techno-crane and Steadicam shots	Shaky cam, run and gun

* "Caméra-épaule," used by documentarists, Free Cinema and Nouvelle Vague operators, is technically the ancestor of the run-and-gun style but should not be confused with the shaky cam as we actually know it. The visual culture of the 1950s is not the one of the 2010s, and a shaky shot does not always mean the same thing.

Post-cool egocentric cinema goes together well with fictional autobiography, which, like "false document" movies, is "the deliberate artificial simulation of a discourse that refers to the past of a real speaker,"[14] and displays "feigned reality statements."[15] Does that mean that postmodern exocentric cinema excludes any subjectivity in order to warm up to its representations? Not at all. We already noted how, from JURASSIC PARK to TOY STORY 3, directors allow imperfections to voluntarily waste the "objectivity" of their computerized worlds, and how these imperfections are not only tolerated but valued by the audience when they can be linked to humanity on both sides of the screen (the fear of the operator to

be wounded, the feelings of the character made "readable" by some technical alteration, etc.). But a lot more CGI effects can be related to this thawing.

What Happens, What I Saw, What I Remember

See for examples two recently released features teeming with CGI: LIFE OF PI (Ang Lee, 2012) and THE GREAT GATSBY (Baz Luhrmann, 2013). In the former, a sad and tragic story is seen as a fairytale by a boy and narrated as such. All that we see onscreen is untrue considering the "real" world, but true considering Pi's heart and mind. In the latter, another sad and tragic story is seen as an epic by a writer who narrates the story. All we see on the screen (and what we hear on the soundtrack) is untrue considering the "real" world, but true considering Nick Carraway's heart and mind. Neither *Pi* nor *Gatsby* are true cases of "autobiographical pacts":[16] Pi is half himself, half Ang Lee and his crew; and Nick Carraway is even more so the offspring of several instances – he stands for both Fitzgerald (since he is writing a novel called *The Great Gatsby*) and Luhrmann's alter egos. But the point is not to find "who speaks." It is to see the world through somebody else's eyes. When a writer recalls a memory, she or he distorts it, and "these encodings and re-encodings of experience necessarily become increasingly subjective. Memoir, then is less about relating the past than editing it."[17] The task of CGI, in both PI and GATSBY is to display this "editing" work. In both cases, every pixel, every composition, every bigger-than-life match move effect is not intended to deliver the cold exocentric calculation of a world, but to permit our journey into the character's imagination and sensibility. This mark is not hit by imperfections, this time, but is hit by overstatement: to use a common psychological dichotomy, CGI does not display bottom-up perception of the world, but top-down cognition. For instance, Fitzgerald writes in his novel:

> A breeze blew through the room, blew curtains in at one end and out the other like pale flags, twisting them up toward the frosted wedding cake of the ceiling – and then rippled over the wine-colored rug, making a shadow on it as wind does on the sea. The only completely stationary object in the room was an enormous couch on which two young women were buoyed up as though upon an anchored balloon. They were both in white and their dresses were rippling and fluttering as if they had just been blown back in after a short flight around the house. I must have stood for a few moments listening to the whip and snap of the curtains and the groan of a picture on the wall.[18]

In order to visualize this description of Nick's environment, from the "frosted wedding cake of the ceiling" to the impression the girls give of having made "a short flight around the house," Luhrmann and his CGI crew spare no costs: ceilings as high as in a cathedral, never-ending curtains moving in slow motion are

"stroking" us when we watch with our 3D glasses on, not to mention smooth waves of low-frequency sounds. No place on earth has such ceilings, curtains, and sofas, and certainly not Tom Buchanan's house – but we do not see Tom Buchanan's house, we see it *re-encoded* by the memories of a Yale graduate and World War I veteran from the Midwest named Nick Carraway. In this respect, we could say *we also* (through the intervention of totally unnatural CGI effects) are astonished by Tom Buchanan's house as it appeared in the summer of 1922 – In fact, it was Hemingway who wrote:

> All good books [for us: all good movies] are alike in that they are truer than if they had really happened and after you are finished reading one you will feel that all that happened to you and afterwards it all belongs to you; the good and the bad, the ecstasy, the remorse and sorrow, the people and the places and how the weather was.[19]

But of course, the audience is made of "perverse spectators,"[20] and as was the case for RACHEL GETTING MARRIED, such a commitment does not automatically happen. A modernist audience, for example, considering getting absorbed in the diegesis is a regressive childish pleasure, would resist the audiovisual excesses or feel uncomfortable with it. That explains, in France, why the daily newspaper *Le Monde* – which remains one of the cornerstones of the orthodox modernist cinephilia[21] – regularly despises this kind of movie. Unsurprisingly, they declared GATSBY a poor movie, full of "these dreadful digital track-ins which transform any narrative situation into a videogame trial [...]."[22] Another danger, in terms of harmony between audience and aesthetic features, lies in the ageing of technology. When Jack Clayton directed his own adaptation of THE GREAT GATSBY, in 1974, he could not of course use CGI, but he resorted to the then *up-to-date* technology, mainly zoom-in associated with telephoto lenses. This device was supposed to give a representation of Nick Carraway's gaze, since Nick (I am here referring to the same scene) is astonished by Tom Buchanan's house but at the same time feels far from the ethical way of life it accommodates (to see something through a telephoto lens means to be able to study details without being physically close). But nowadays – think of Quentin Tarantino and other postmodern directors who quote such devices just for fun – a zoom-in associated with telephoto lenses "means" above all else the beginning of the 1970s era. It lost its evocative power in aid of becoming an outmoded signal in the history of film style. And one day the 3D CGI and hip-hop music of Luhrmann's GATSBY will suffer the same fate.

However, CGI and other large-scale cinematic technological displays keep an ultimate card up their sleeves. It is the ability, on both sides of the screen, to take pride in a job well done. The photorealistic precision of an average blockbuster, as suggested by the hundreds of names lined-up under the heading of "CGI effects,"

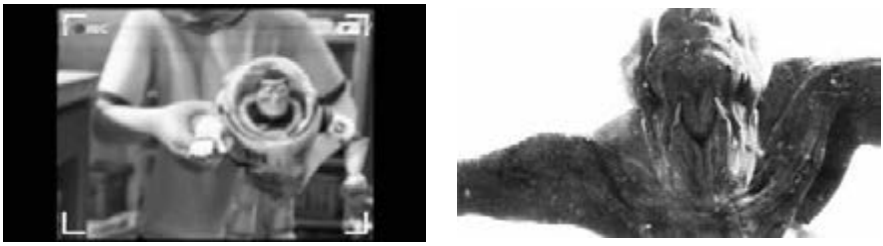

Fig. 3: Two cases of remediation. Left: In Toy Story 3*, the hi-fi apparatus appropriates the lo-fi one. The aspect ratio falls from 1:1,66 to 1:1,33, leaving two vertical black stripes; the REC signal and the four white frame marks are clearly visible, complete with the battery signal; the entire image is blurred because the autofocus system takes a long time to move on; the upper horizontal part of the image is deformed due to the tape's wow and flutter. All these "deficient" characteristics are feigned by a technically perfect high-tech system. Right: In* Cloverfield *(Matt Reeves, 2008), the lo-fi apparatus appropriates the hi-fi one. The hideous alien comes from CGI disembodied hi-fi representations of reality, while the little pale stains between him and us signaling "reality" is mediated by a simple handy cam whose lens is dirty because it fell on the grass a few seconds before.*

is achieved by several months of hard labor and armies of experts. Most spectators, even if they are not convinced by the story or by the aesthetic biases of the movie, at the end acknowledge it was "technically well done." A sociological inquiry, in this respect, showed a few years ago why numerous French communist steel workers of the 1950s were overly fond of Hollywood Golden Age movies: the ideology displayed by these movies was of course not their cup of tea, but they did not care about ideology. The point was: they saw jobs well done, i.e., jobs done (mainly by actors and actresses) with as much dignity and sense of responsibility as they themselves put into their factory work.[23] And when on the screen the RMS *Titanic* sinks or when Manhattan is destroyed by alien invaders, the amount of work is undeniable. Behind the amount of work, at last, lies the fascination for larger-than-life spectacles, in which John Dewey, building the basis of a pragmatist aesthetic, saw the roots of the human tendency to be moved by artworks:

> In order to understand the esthetic in its ultimate and approved forms, one must begin with it in the raw; in the events and scenes that hold the attentive eye and ear of a man; arousing his interest and affording him enjoyment as he looks and listens: the sights that hold the crowd – the fire-engine rushing by; the machines excavating enormous holes in the earth; the human-fly climbing the steeple-side; the men perched high in the air on girders, throwing and catching red-hot bolts.[24]

Fig. 4. Left: Stagecoach (John Ford, 1939). The fixed camera on the ground is level, and the aim is to increase our fear about the plight of one of the main characters who (voluntarily or not) falls out of the coach – he or she will irremediably get trampled. Right: Seventy years later, in a mainstream Disney cartoon (Tangled, Byron Howard and Nathan Greno, 2010), the staging is both close to and far from its ancestor. The camera is not level anymore – it is a Dutch-angle shot – and it uses a wide angle "lens" (quotation marks since this is CGI, which means no real camera nor real lenses were used). The feelings that are evoked changed too: in this little medieval fairytale town, there is an operator trying his best to tape what suddenly happens. He has no time to level his camera. We understand how astonishing the event is – Flynn escaped death and he ran away! – because this shot is not technically perfect. The mediation produces a direct effect on us more than the narrative episode itself, especially as a Jurassic Park-style shaking effect has been added at the very moment the horse reaches the ground with its front hoofs.

Nobody would deny CGI the power to represent convincing fire engines or "enormous holes in the earth" (see the caving in of a football field in The Dark Knight Rises, Christopher Nolan, 2012).

Cinema as a Situation

To finish, one must not overstate the opposition between CGI hi-fi scenes and shaky camera lo-fi scenes, since nowadays they come mixed. Every side finally understood how useful the weapons of the other side could be, and appropriations go both ways.

As a result, and all problems of ethical ambition and artistic achievement aside, *experiencing* movies probably is now more "vivid" than ever, thanks to the combination of hi-fi and lo-fi devices. Let us have a final example and compare two cinematic solutions to a single aesthetic and narrative problem: how to scare a spectator by showing him how vulnerable he would be if he were in danger to be trampled by a stampede of unleashed war horses.

In this chapter, we have seen that the CGI hi-fi apparatus and lo-fi shots are engaged in a war whose trophy is truth. Which one is telling it? The hi-fi side, claiming CGI is apt to model the "real" world? or the lo-fi side, claiming that high-tech devices build post-human cold calculations of a world that never existed and will never exist, while lo-fi includes the observer in the observation in order to improve the sharing of the experience? In such an epistemological dichotomy, technology appears itself as a condition which permits or forbids the access to a useful knowledge of the world. But it is a (bad) formalist way to think. As we have seen too, not only hi-fi and lo-fi technologies are more and more intermingled in each new release, but we have to think of cinema as a *situation*, and not as a technologically built text, in order to understand how some truth can be found in it. To sum up, a situation is a collective agreement between individuals about the different ways to appropriately react and adapt to a given socially situated interaction, as interactionist sociologists, from W.I. Thomas to Erving Goffman, stated. As soon as 1933, Herbert Blumer – himself an interactionist sociologist – already asserted,

> [M]ovies do not come merely as a film that is thrown on a screen; their witnessing is an experience which is undergone in a very complex setting, [as they] serve as a source for considerable imitation. Forms of beautification, mannerisms, poses, ways of courtship, and ways of love-making, especially, are copied.[25]

What was acknowledged two years later in the academic anthropological field by Marcel Mauss and his conference paper "The Techniques of the Body," in which he underlined the fact that cinema is a kinesthetic form of imagery ever since he saw girls walking in a particular manner both in Paris and in New York – a manner they had seen in the movies and imitated.[26]

Once one considers cinema as a sociohistorical succession of situations, it becomes difficult to assign a particular technology to a particular effect.[27] The way we read technological effects varies through time and depends on cinephile communities – everybody knows a given aesthetic device, which moves us to tears, can appear as unbearably kitsch to the spectator seated next to us in the theater; and the other way round. Nevertheless this variability does not keep both filmmakers and spectators from studying preferences for the so-called *lo-fi* or *hi-fi* ways of making images, and the categories of arguments they may use to justify these preferences.

PART III

Cinema and Media Technologies: A Historical Context

Marey's Gun: Apparatuses of Capture and the Operational Image

Pasi Väliaho

We often approach the histories and theories of moving image media in terms of the art and technology of projection. While the understanding of cinema as continuing the tradition of optical shows and magic theaters no doubt discloses an important aspect of the medium, it simultaneously occludes one decisive line of development: the alternative conception of "cinema" as the mechanical recording and automation of movement that can be highlighted in the context of the late-19th-century life sciences, in particular. It was in this context that precinematic devices such as chronophotographic apparatuses – epitomized by the "photographic gun" (*fusil photographique*) that the French physiologist Étienne-Jules Marey made in 1882 – were developed to scrutinize the living in terms of its dynamic expressions. A range of different kinds of machines was designed to capture and reproduce what was seen to be the essence of life: movement.

The following explores this alternative trajectory of cinema to articulate the medium as a specific kind of apparatus of knowing and reproducing the living. Focusing on Marey's photographic gun, the aim is to think of media technologies in terms of technologies of government, and in this particular case, in terms of the biopolitical capture of life into fields of knowledge, intervention and control, the notion of "biopolitical" referring here, following Michel Foucault, to strategies and mechanisms, developed since the 18th century, that come to harness the creative forces of living beings (from physical activity to mental dispositions) into a machinery of profitability.[1] This capture, as we will see, is not a question of spectacles, but rather, of functional, even secretive "operational images," which over the course of the past 150 years have gradually become an intrinsic feature of our lives.

Photographic Gun

Everywhere he lived, Marey surrounded himself with animals and machines: recording instruments, photographic apparatuses, cages, and aquariums filled with fish, pigeons, lizards, and so on. "Everywhere, in every corner, life," as the photographer Nadar noted about his visit to Marey's office and living quarters in

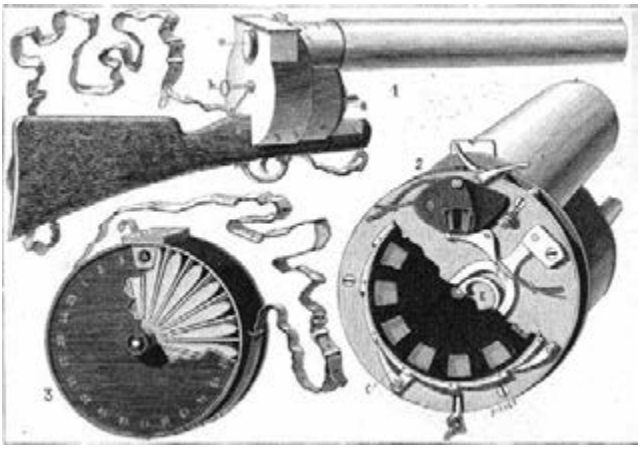

Fig. 1: Marey's photographic gun, La Nature, *April 22, 1882.*

Paris in 1864.[2] Or, life coupled with technological mediators, one should add, to acknowledge the extent to which, for Marey, life as an object of study could not be epistemologically separated from various kinds of scientific apparatuses, which the physiologist envisioned as "indispensable intermediaries between mind and matter" necessary to overcome "the insufficiency of our senses."[3]

Among the myriad of fauna, birds were of particular interest for Marey throughout his career. The physiologist, who also very much acted as an engineer, anticipating modernity's key technological developments, from the cinema to the airplane, was keen to unravel the secrets of aerial locomotion. The aim was to imitate and reproduce the flight of winged creatures so that us humans, too, would to be able to "travel through air" in the very near future.[4] In this regard, the patterns of movement that birds' wings perform in interaction with air, which evade the slow thresholds of human perception, presented an epistemic puzzle that needed to be solved by technical means. In the 1860s, Marey had already started to develop and perfect his recording instruments based on the "graphic method," that is, the measurement of physiological processes such as the heartbeat, breathing, muscle activity, etc. by using graphs to depict change over time.[5] To get accurate data about the movement of wings, Marey would wire an individual bird with his recording machines: electrical tracings signaled the speed of the wing movements and myographic tracings indicated the contraction and relaxation of the pectoral muscles. Marey also constructed mechanical bird models to test and synthesize the information so gathered by the instruments.[6]

It was in the purpose of deciphering the mechanics of flight that Marey also developed one of his first chronophotographic apparatuses, the photographic gun, described in an article published in *La Nature* in 1882 (Fig. 1).[7] The device, as the physiologist acknowledges, drew on the idea of the "astronomical revolver,"

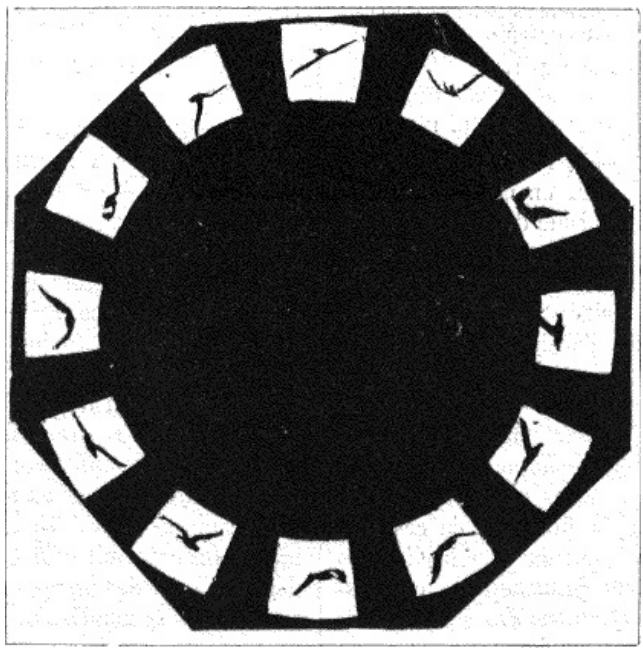

Fig. 2: Flight of gull, chronophotograph by Marey, La Nature, *April 22, 1882.*

which Marey's colleague, the astronomer Jules Janssen had designed in 1874 to record the transit of Venus across the sun: a combination of a photographic camera and a telescope to capture sequential images of the passage of the planet. Janssen had already noted, when musing on the possible uses of his invention, "how interesting it would be to obtain a series of photographs reproducing the various aspects of the wing during that action."[8] This was exactly the objective behind Marey's image-shooting machine. Further inspiration came from Eadweard Muybridge's studies with instantaneous photography, starting with the study of the trot of Occident, Leland Stanford's horse, in the early 1870s. However, the equipment Muybridge was using was heavy and unsuitably clumsy to capture the rapid movements of birds and insects.

Trying to overcome this shortcoming, Marey designed a device that was about the size of a hunting rifle, portable and free to aim from any angle. The photographic lens was located in the barrel, while the bottom end of the barrel housed a magazine containing a cylindrical glass plate alongside two disks with shutters. Pulling the trigger made a clocked mechanism of the three disks move inside the magazine and record pictures sequentially. The model described in *La Nature* took 12 images per second with the exposure time of 1/720th of a second.

One of the first subjects of Marey's experiments with his gun was an anonymous gull flying supposedly somewhere on the coast near Posilipo (Naples),

Italy, where the villa in which Marey spent the winters and developed his apparatus was located (Fig. 2). Here, the study of the large-scale movements of celestial bodies as carried out by Janssen was turned into the capture of the swoops and dives of winged creatures capable of mastering the aerial ocean. The pictures Marey was able to make were nonetheless (as he affirms) somewhat lacking in detailed information, and the interval was not short enough to come up with a desired reconstruction and analysis of the mechanics of motion by means of animation devices such as the phenakistiscope. But the potential advantages of the instrument seemed obvious, especially when it came to extending the reach of knowledge of how different species of birds fly in various environmental conditions, in calm winds or alternatively when pulled by gusts.

Cinematic Apparatus

Of course, in the final analysis, the photographic gun could be aimed not only at animals with wings, but at any living being, covering in principle the whole realm of *zoe* in its crosshairs. Furthermore, the gun initiated the construction of several more elaborate chronophotographic apparatuses, which Marey worked on during the 1880s and 1890s, charting movement on either a single or several plates and covering a wide range of phenomena from the physiology of flight to the gestural economy of manual labor and even to the invisible motion of air currents.[9]

In this sense, there is one word that perhaps best describes the functioning of Marey's chronophotographic method: capture. Or, more precisely, the capture of life in its (potentially) moving image. The apparatuses sought to record traces of the living on the silver-gelatin or other type of emulsion in the purpose of the analysis and simulation of motion as well as measuring the forces that determine movement[10] – a kind of "motion capture." Life was in Marey's eyes equated with movement. "Motion," the physiologist wrote, "is the most apparent of the characteristics of life; it manifests itself in all the functions; it is even the essence of several of them."[11] Hence, instead of killing the objects it was targeted at, the photographic gun was to affirm animate life in all its positivity, dynamics, and complexity, which is something arguably different from the phenomenology of traditional photography: not ghosts of the living (as Roland Barthes would have it),[12] but the living itself.

In this respect, the chronophotographic machines that Marey designed and built were much more than mere instruments. It is not only by verbal association that the idea of capturing life resonates with Gilles Deleuze and Félix Guattari's notion of the *apparatus of capture* [*appareil de capture*]. This, bluntly put, points out the different and changing mechanisms by which the activity of living beings becomes abstracted, homogenized, and channeled for capital accumulation.[13] "Capture" is, for Deleuze and Guattari, a process of bringing together bodies,

things, and persons into specific arrangements or assemblages in order to profit from their productivity. In its many forms, the accumulation of capital implies, in one way or another, the apprehension, according to a certain model of intelligibility, efficiency, and functionality, of living beings into circuits of production and consumption that impose upon them a framework of standardized and stratified ways of being, doing, and making sense.

Marey's gun does indeed come across as an apparatus of capture in this particular sense, geared as it was toward the extraction of forces of the living in the purpose of manipulating and (re)directing them. The gun functioned above all as an epistemic "grid," or better, a *technē* in the sense of practical knowledge and action, that filtered the world in perception through the parameters of quantification, homogenization, and standardization. Rather than being considered aesthetically pleasing, for instance, any kind of movement – running, throwing, flying, walking, jumping, crawling, and so forth, intentional or not – was to be disassembled into and scrutinized in terms of minute spatio-temporal coordinates. Critical here is the way Marey's work resonated with the epistemic dynamics of industrial capitalism and the systematic mechanical control and optimization of life's productive forces exemplified by Taylorism, among other things.[14]

What becomes evident in Marey's gun is that, generally speaking, technical devices never simply are what they first seem. In capitalism's indifference to (categorical) difference, and embrace of repetition (under the guise of the constantly new), guns easily become cameras, and vice versa, with the result that inferring the purpose and function of technologies from their apparent uses would simply be a mistake. Any gadget becomes operative and meaningful – acquires agency, if you will – only as part of larger systems of power, knowledge, and action. It is these systems that Michel Foucault called *dispositifs*, often translated into English as *apparatus*. In an interview from 1977, he defined the apparatus quite loosely as a network or "ensemble" that in a given historical moment becomes established between such heterogeneous elements as discourses, institutions, architectural forms, laws, scientific formulas, philosophical and moral propositions, administrative statements as well as technologies.[15] Foucault stressed that "the apparatus itself is the system of relations that can be established between the elements. Secondly, what I am trying to identify [...] is precisely the nature of the connection that can exist between these heterogeneous elements."[16] What, according to Foucault, makes the apparatus distinctive as a network of such heterogeneous and even discordant elements is that it has a "dominant strategic function" in relations of power. An apparatus, Foucault outlined, implements a certain kind of manipulation of forces of life so as to channel them in a desired direction, to block them, or to stabilize and utilize them at a given moment.

Recently, Giorgio Agamben has developed Foucault's apparatus concept by shaping its definition to apply to "literally anything that has in some way the

capacity to capture, orient, determine, intercept, model, control, or secure the gestures, behaviors, opinions, or discourses of living beings."[17] Here, the apparatus's meaning as a technique and logic of power becomes evident. Indeed, Agamben has emphasized the etymological connection that Foucault's notion of *dispositif* (deriving from Latin *dispositio*) has with the word *oikonomia* especially in the sense of "divine economy," which the word acquired in Christian theological conceptualizations of the divine rule on the earth. Without going into details of Agamben's analysis, *dispositif* and *oikonomia* both find their semantic core in the notion of government, that is to say, sets of practices, measures, institutions, and bodies of knowledge employed in organizing and controlling the movements, behaviors, and actions of humans and other living beings. Government is not primarily concerned with the sovereign juridical rule of a territory; nor is it primarily concerned with the discipline of bodies and persons. Rather, it is a mode of power that pertains to conducting the movements of active, productive individuals, and their relationships with each other as well as with their material environment.

Agamben even proposes a general ontological partitioning of beings into two groups: on the one hand, living beings, and on the other, apparatuses into which living beings are captured and which seek to govern and guide individuals. Following this line of thinking, Marey's photographic gun belongs to the latter ontological category concerning the self-replicating mechanisms of power to which life becomes exposed. The gun presents a "cinematic" mode of government in the sense that it seeks to capture, manage, and regulate the movements and energies of the living. It is a biopolitical apparatus of capture in that it, quite simply, contributes to exposing, optimizing, and controlling the forces of life.

Operational Image

The apparatus concept as conceived above prompts us to think of technical devices in terms of governmentality (the administration and management of the activities of living beings), and as becoming operative and meaningful when embedded within larger social, institutional, epistemic, aesthetic, and political arrangements. From this angle, Marey's photographic gun appears as a biopolitical technology that renders life amenable to government as well as capital accumulation within a particular visual – and indeed cinematic – economy of movement.

Interestingly, the gun thus compels us to approach the genealogy of cinema from an angle that is quite different from the "apparatus theoretical" conceptualizations of the 1970s and 1980s, of the ideological-psychic mechanisms involved in film spectatorship. Jean-Louis Baudry famously articulated cinema as a *dispositif*, referring to film as a technology that generates a particular kind of viewing position with specific psychic effects, as well as to institutionalized film forms that keep on reproducing this type of spectatorial arrangement.[18] Fashionable as

it might nowadays be to debunk such generalizations as essentialist (or something similar), let us just note how Baudry's cinematic apparatus is fundamentally based on the notion of projection and seeks to conceptualize the particular kind of psychic capture and government that the movie machine as a projector of light and shadow, as an optical spectacle, is able to implement. However, Marey's gun shifts the attention from projection to recording, and from the realm of the phenomenological to what lurks beyond the immediate reach of the senses. Government here concerns, not the contents of our dream-like hallucinations, but the modulation of life processes by bringing them into the field of knowledge and intervention.

Marey's gun should perhaps, then, be seen as an early indicator of what "cinema" – understood broadly as a visual economy of movement – is becoming in today's networks of power. It fashioned a mode of vision that outlines and automates intensities and tendencies of movement, aiming at spatialization and calculation; a vision that traces, scans, reorganizes, and abstracts rather than resembles or represents; a vision that turns our lives into statistical "data."[19] Accordingly, one could regard the photographic gun as a precursor for what Harun Farocki has termed "operational images," that is to say, functional images that increasingly define and determine the sphere of everyday life today, from automated CCTV and missiles to computer simulations and industrial robotics.[20] In terms of its circles of production and consumption, this imagery does not conform to what is traditionally, either in terms of education, art, politics or entertainment, expected from the "image." Rather than meant to be something to be gazed upon and serving the purpose of instruction, aesthetic pleasure, enjoyment, or even propaganda, it is defined by its functionality. Farocki characterizes operational images as ones that are part of a process, rather than portraying a process. They contribute to the execution of a technical, industrial, military, or some other kind of operation, for instance, calculating and predicting the average paths of consumers, or pattern recognition in machine vision used in assembly lines or in so-called smart bombs.

The photographic gun can be considered part of this trajectory of the development of visual technologies of government – especially those of pattern recognition and motion capture, which concern the calculation of patterns of movement for the purposes of surveillance, for instance. Of course, if captured by today's vision machines, the flight of the anonymous gull would not simply remain a series of more or less distinctive traces on the silver-gelatin emulsion. Its trajectory could be predicted by computer vision; the movements of the bird's wings could be simulated by algorithms; a robotic weapons system could both shoot a video of the gull or shoot it down, making no distinction between a camera and a gun. But the general logic that pierces through both Marey's invention and these contemporary technologies is one of taking charge of living beings by means of images that seek to turn gestures and expressions into quantifiable and calcul-

able data – a logic one could describe, in a word, as biopolitical. The photographic gun from 1882 exposed living beings to measurement and control. In doing so, it foreshadowed our contemporary world of biopolitical screens.

Re-editing as Psychotechnique: Montage and Mediality in Early Soviet Cinema

Malte Hagener

According to traditional historiography, Soviet cinema comes into existence in the mid-1920s when the triumvirate of Sergei Eisenstein, Vsevolod Pudovkin, and Alexander Dovshenko suddenly and seemingly out of nowhere bursts onto the scene. Classical film histories might offer a few lines on Tsarist cinema, but they contain little, if anything at all, on the years 1919 to 1924 because – as would be the standard argument propagated by Henri Langlois – the chaotic situation following the revolution, the lack of resources and the general turmoil, did not allow for any systematic film production. In effect, there was hardly a film production to speak of, therefore there was no need to write about the period. In the past 20 years, this has changed markedly, especially in the wake of the 1989 Pordenone retrospective "Silent Witnesses" and its 1996 sequel "In the Land of the Soviets, 1918-1924."[1] Another decisive shift has been the recent "discovery" of the early films of Dziga Vertov, who was virtually unknown in the West[2] until his extended tour promoting The Man with the Movie Camera (Celovek s Kinoapparatom) in 1929.[3] Vertov already complicates the canonical story of Soviet cinema because his materialist practice offers a different kind of cinema from the narratively driven, rhetorically laden revolutionary films of the 1925-1930 period.[4]

Yet again, it would be misleading to play off Vertov against Eisenstein (or other filmmakers from this period) because their theory and practice, albeit in different ways, did put the materiality and mediality of film at center stage. If considered in this perspective, Eisenstein's voluminous thinking can be summarized as a series of ideas on psychotechnics and biomechanics related to how film technology and mental activity intersect: the attraction (the collision of two shots) acts as a stimulus on the psyche triggering specific responses, thus intellectual montage can be seen as an external simulation and visualization of thinking and imagistic discourse, while pathos and ecstasy function as a transport into a pure state of sensation and feeling. Lev Kuleshov was interested in how the coupling of shots was forged into an imaginary spatial and temporal unity by the spectator, while

Vertov championed the interval as the force prying open the imaginary space between shots. All reactions of the spectators resulted from the careful crafting of filmic material, the selection and arrangement of shots, which could be, at least this was the hope at the time, measured, planned, and triggered. In this sense, the Soviet cinema of the 1920s was not – as is often claimed – primarily interested in rhetorical devices and storytelling techniques in the service of politics, but rather in the capabilities and opportunities that the medium could offer. I want to focus on one specific example here – the re-montage of existing material – because it shows how a specific historical situation gave rise to specific techniques and a specific employment of the medium's possibilities. Implicit in this discussion is an attempt to rethink the nexus of style and technology as a complex negotiation in which neither side dominates the other, thus avoiding any kind of determinism.

The Practice of Re-Montage

What characterized the Soviet cinema in its first years of existence was dearth – the lack of material and resources after the war and revolution had two immediate consequences: on the one hand it resulted in a scarcity of (feature) film production, while on the other hand, paradoxically, it led to an extraordinary outburst of creativity. In the first years after the revolution, the young Soviet Union produced very few feature films, but concentrated instead on two forms of filmmaking, treated marginally in most film histories: re-montage and non-fiction. Two of the most famous filmmakers who took up film immediately after the revolution (and before the triumvirate Eisenstein, Pudovkin, Dovshenko rose to prominence) could be seen as embodiments of these two larger trends: Lev Kuleshov, known for his montage experiments, most famously the formulation of the proverbial "Kuleshov effect"; and Dziga Vertov, known for the category-bursting non-fiction production of the early years of Soviet cinema. Without wanting to personify these larger trends and while trying to undermine the overriding *auteur* theory still prevalent in film history, the oeuvre of these two celebrated directors can be productively mapped onto a genealogy of re-editing and non-fiction. I will deal here with the re-editing of existing films while non-fiction would require a different kind of reflection.[5]

In the early 1920s, most films exhibited in the Soviet Union were foreign productions, mostly German and American, or films that originated in the Tsarist period. Yet, these films were often shown in altered versions since the film committee already had, in early 1919, founded a section for the re-montage of foreign films (and of films produced before the revolution), a practice dating back to 1918 and that remained common during the whole existence of the Soviet Union.[6] A good many filmmakers sharpened their eyes and scissors while practicing these transformations, among them Lev Kuleshov, Sergei Eisenstein, and

Esfir Shub. The practice of re-montage consisted first of all of the cutting and removal of excessively violent or overtly sexual scenes. Obviously, this common way of censorship was not specific to the Soviet situation alone. More importantly though, far-reaching changes were made when films were converted ideologically: whole sequences were pieced together in different ways, titles were changed, and shots were removed to give a film a different political thrust. A classic example of this "bolshevikation" of Western films is the transformation of DR. MABUSE, DER SPIELER (Fritz Lang, 1921/1922) into GILDED PUTREFACTION (Eisenstein/Shub, 1924).[7] Apparently, Eisenstein took time off from the editing on his debut STRIKE (STACHKA, 1925) in order to work on Lang's film, which demonstrates that this was not just an assignment done grudgingly, but an integral part of developing a different way of making films. There was a special value involved in working with existing material (instead of shooting one's own); there was something to be learned from the rearrangement of shots and the modularity of film. The Soviet montage school is unthinkable without this practice of creating new meaning by cutting, repositioning, or exchanging shots.

The technique was widespread, as practically all foreign films were re-edited. As Yuri Tsivian reports, these specialists and cinephiles *avant la lettre* developed an extraordinary pride and confidence in their work:

> They were connoisseurs: no one in the film industry (or outside it) knew Western cinema better than the re-editors; they were experts: few filmmakers compared to them in mastering the technique of editing [...]; they were arrogant: they believed they could improve Griffith! And despite being badgered by film critics, they were proud of their profession![8]

The reversal of hierarchies so typical of the Soviet culture in the 1920s related to the theory of re-montage on a number of levels. One can point out, for instance, the inversion of the traditional evaluation of the arts, most famously encapsulated in Lenin's legendary claim for film as "the most important of the arts." Additionally, the eccentricity and the carnivalesque in FEKS (factory of the eccentric actor);[9] the significance of the circus, highly valued by Eisenstein; the prominent feature of the music hall in work by the Futurists;[10] and the notion of "ostranenie" (making strange) by the Russian formalists,[11] are all indicators of this reversal of hierarchy. Here, the inversion of center and periphery adheres to a practice of breaking down traditional barriers and evaluations, of toppling traditional value judgments, of rearranging existing elements. Undermining and transforming the narrative, making a film state something unintended as in the re-montage is akin to this reversal of established hierarchies.

From Collage to Montage: Modernism

In retrospect, the Soviet cinema of the 1920s is often subsumed under a single term: montage. It is hard to disagree with this claim, as the collection of heterogeneous fragments, the juxtaposition of different parts, and the sudden clash of diverse pieces indeed became an important and central aspect of the films that came to represent the Soviet production as a whole in the West. While it is important to remember that the 1920s also saw a popular cinema of genre films and an interest in film stars,[12] the focus of this chapter will remain on the more highbrow art aligned with the avant-garde. In fact, montage in a wider sense is not specific to the cinema and it was widespread in avant-garde art practice of the 1920s.[13] The concept itself can be found in various guises across different modernist art forms: from collage in visual arts (Cubism and Surrealism, Hannah Höch), to the integration of everyday material in literature (Tristan Tzara, James Joyce, John Dos Passos, Alfred Döblin), all the way to the usage of existing phrases in sound art (Charles Ives, Walter Ruttmann's WEEKEND). In Russia, montage was prefigured in pre-revolutionary art, especially in Futurism and constructivism, and then taken up via theater, as can be seen in Sergei Eisenstein's short film, GLUMOV'S DIARY (1923), which was made for a theater production.

This opens up a wide horizon for understanding the practice of re-editing, or re-montage. In formal terms, re-montage was related to collage because the creative act consisted of cutting up, isolating elements, destroying an old context and creating a new one, when re-combining the pre-existing parts in a different whole. Re-montage could also be related to the Dadaesque technique of blowing up an ordered bourgeois universe and creating non-sense (or anti-sense); the title GILDED PUTREFACTION could have easily been thought up for a Zürich Dada soirée or for a meeting of the Parisian surrealists. Moreover, an element of abstraction can be found in this strategy as the narrative – which traditionally takes center stage – recedes into the background and fresh meaning is created from existing material in a new assembly. It is on these three levels – collage technique, destroying existing order, and abstraction from a predominance of narrative – that the Soviet cinema aligned itself with avant-garde preoccupations in a more general way. In fact, the practice of reverse engineering (i.e., taking something apart in order to understand its functioning) is typical of a constructivist ethos: isolating elements, examining how energy is generated through a particular sequence by focusing on the contrast and alternation of parts, and putting the elements together again. The modular approach, constructing a whole from a limited number of existing entities, proved to be crucial for montage, as the filmmakers saw themselves as engineers working on the hearts and minds of the people.

This new practice was fundamentally born from the capabilities of the medium, as Jay Leyda in his pioneering study on the compilation of film has argued:

"The basic technical contribution of Kuleshov [...] was the discovery that there were, inherent in a single piece of unedited film two strengths: its own, and the strength of its relation to other pieces of film."[14] The new practice also called for a different organization of labor which followed a specific model: the collective or the reliance on a small and stable group. One can think here of the FEKS collective, of Eisenstein and his assistants (they called themselves "the iron five"), of Kuleshov's workshop, of Dziga Vertov's Cinema-Eye group, of the Proletkult collective and many more.[15] Working in collectives had two direct effects: on the one hand, this was meant to work against the diagnosis of alienation from work that orthodox Marxism saw in Fordist factories, where tasks were divided into minimal units assigned to different workers; on the other hand, producing in small groups of highly skilled specialists is reminiscent of engineering teams in research departments. The Soviets were fascinated by modern industrial production in which labor was divided according to abstract models of flow and efficiency. Similar models were developed by Frederick Taylor, whose ideas influenced Vsevolod Meyerhold's notion of biomechanics (which in turn can be found in Eisenstein's thinking). In fact, the Soviet montage cinema arguably occupies the confluence of scientific management and Pavlovian behaviorism, since it can be mapped on the human body and psyche.[16]

In the desire for renewal and restructuring, these examples are not only novel models for organizing labor processes that address the individual as a specific bundle of physiological and psychological reactions, but these activities also gave rise to the study and teaching of the medium. Tellingly and crucially, the collective was not only a work collective compatible with communist society, but it moreover led to a dissemination of knowledge and abilities that were in traditional film cultures (like in Hollywood or Weimar Germany) heavily policed by specialists' associations. The pedagogical impetus of the avant-garde has traditionally been neglected, yet education is a crucial element in any attempt at restructuring the power relations in the cinema.

Practical Research and Theoretical Practice: Studying the Cinema

The idea of technē, prevalent in 1920s Russia, is one in which formal and aesthetic elements cannot be distinguished from technical or practical questions. Therefore, technē does not distinguish between art, science, and technology, between theory and practice; instead, it connects skill with reflection. The early experiments of Soviet film were as much practical research as they were theoretical practice. In this sense, the Soviet filmmakers behaved like engineers faced with the daunting task of making a new machine from the recombination of old parts. At the same time, this process was seen as a learning experience which could be reflected upon and appropriated in the next films to be made. Hence, many of the early montage experiments took place in an environment of teaching

and learning – in fact, (professional) filmmaking was not yet separated from teaching and other didactic work. This merging of art and learning can be seen for instance in Meyerhold's theater experiments which brought Eisenstein to the cinema, in the workshops of Kuleshov and FEKS, or in the work of Georgii and Sergei Vasiliev, later famous filmmakers in their own right remembered mainly for the socialist-realist classic CHAPAEV (1934). The Vasilievs put together an educational film from existing material, THE ABC OF FILM EDITING (AZBUKA KINOMONTAZHA, 1926) that illustrated the practice of re-editing. While the film was used in class at the Film Institute in Moscow, there was also a book published under the same title in 1930. Just like the avant-garde wanted to overcome the barriers separating life and art, Soviet film culture aimed at an approach to the medium that took the basic characteristics of the medium as its starting point.

It is worth dwelling in a bit more detail on the workshop of Kuleshov and the "films without films" which were staged in this context, as this practice illustrates how the medium film could be abstracted from its technical and material basis. This was the preferred method of teaching in the early years of the VGIK, the Russian State University of Cinematography, which had been in existence since 1919, first as an acting school which was successively transformed into the first film school anywhere in the world. The "films without films" were performed on flexible stages with swift scene changes in order to master formal aspects of montage in a different medium. Of course, lack of cameras, film material, and other necessary equipment played a part in the reversion to theater, but implicated in this practice was also an abstraction and generalization which had a didactic effect for learning the principles and processes not in a passive and abstract way, but concretely using a case study. When considering Kuleshov's workshop it becomes clearer how mastering technique is bound up with an investigation into the basic functioning of a medium:

> From 1922 through 1926 [...], the workshop held classes off campus. Class members were permitted to study with Kuleshov alone and were excused from attending courses taught by other teachers. The group's autonomy encouraged a sense of collective learning and cohesiveness within the class. Individual students with special skills – boxing, acrobatics, set design – led classes within their areas of expertise. Exams and grades were never administered; instead, particular achievements were recognized by tokens ranging from ribbons to flowers, and these were issued on the basis of a student vote. In lieu of reading assignments, the group collectively attended movies at Moscow theaters, studying and discussing the only texts they deemed worthy – film.[17]

In formalist circles, such as the journal *Lef*, the debate on re-editing peaked around 1926 when the Soviet cinema was taking another direction – from large-scale experiments toward narrative-driven films aimed at achieving a specific political effect. Writers at *Lef* took issue with Dziga Vertov for shooting new material, but also for the way he used documentary material, thus destroying it for future use. As Mikhail Yampolski has argued:

> Films were born from the film archives as from the earth, in order to return again to them. The eternal document absorbed the transient film. [...] In so far as the material was understood as raw material for permanent re-combination, the film archivebecame an endless and inexhaustible source for the future film-maker.[18]

Not coincidentally, the mid-1920s was the time when the achievements of the Soviet cinema became first visible to an international audience in films such as Eisenstein's BATTLESHIP POTEMKIN (BRONENOSEZ POTEMKIN, 1925), Pudovkin's MOTHER (MATJ, 1926) or Kuleshov's BY THE LAW (PO ZAKONU, 1926). One had to discard at least of the more radical part of this (apparently) uncontrollable practice which was nevertheless a necessary step in developing the specific techniques of meaning-making through montage.[19]

Yet again, Soviet filmmakers had no monopoly on this kind of practice. Films created through the practice of montage and re-contextualization of existing footage could be found at the same time in avant-garde circles across Europe: BALLET MÉCANIQUE (Dudley Murphy/Fernand Léger, 1923) uses pre-existing footage; INFLATION (Hans Richter, 1927) is comprised almost entirely of stock shots; as is the satire HISTOIRE DU SOLDAT INCONNU (Henri Storck, 1932).[20] At the same time, similar techniques were also not uncommon in more mainstream circles: under the auspices of the German film studio Ufa, popular compilation films were made by Oskar Kalbus, e.g., on Henny Porten (HENNY PORTEN. LEBEN UND LAUFBAHN EINER FILMKÜNSTLERIN, 1928), and Prometheus also heavily re-edited Soviet films for re-distribution in the West.[21] Arguably though, the Soviet experiments were the most radical and the most far-reaching, as they combined psychological and physiological elements with artistic and cultural considerations.

Conclusion

It is always difficult to establish direct links of cause and effect, but it is hard to deny that the widespread practice of re-editing – corroborated by the lack of material after the revolution – played a crucial part in establishing montage as the key technique of filmmaking. It could be argued that these experiments gave many of the filmmakers that rose to prominence in the 1920s the chance to de-

velop skills and techniques that they would later integrate into more standardized and predictable forms in the service of the revolutionary cause. The question that was implicitly asked in the different experiments was whether meaning was inherent in a shot or whether it was the sequence in which it was edited that fixed its meaning in a certain way. Therefore, the nexus between the collision of shots as experienced in the spectator's psyche and mind was seen as the gravitational core of filmmaking, rather than the indexical nature of the image or the phenomenon of images in movement.

The 1920s in the Soviet Union saw a broad reception, discussion, and application of psychological theories in politics and economy, but also in the arts and culture, all the way from Taylor's scientific management to Rorschach's and Pavlov's psychological experiments. In this respect, montage was seen as a specific psychotechnique meant to directly work on and stimulate the body and mind of the spectator. The cinema as a modern machine was likened to the mind, which was conceived as a similarly modern machine whose functioning, it was believed, could be decoded by science. Montage was seen as the key to understanding the functioning of the mind and the effects of combining specific shots could be ascertained in exact terms. It was through exploring these relations that theory and practice, creating and learning came together up until the mid-1920s when the changed context of film production cut short some of the more radical experiments. In the meantime, these attempts were instrumental in bringing about the astonishing output of the Soviet cinema between 1925 and 1932.

Technophobia and Italian Film Theory in the Interwar Period

Francesco Pitassio

> Cinema would not change in any way its character, if specialized miniaturists painted the whole film in miniature, instead of it being photographed. [...] Image origins are indifferent to film art, since film "matter" lies only in internal relations between image series creating a unity, and so forth.
> – Eugenio Giovannetti, 1933

Somehow, Italian theorists of the interwar period, who were very suspicious of technology and of theoretical discourses concerning cinema technologies in particular, often explicitly disassociated themselves from technology. They were in some respect *technophobic*, meaning that they feared "the effects of technological developments on society."[1] In some ways, the attitude of Italian theorists toward technology is somewhat surprising as it stands in sharp contrast to Italy's own cultural heritage handed down by the Futurists, who, from the 1910s on, celebrated technology in art; it also stands in sharp contrast to the interest in cinema's technological newness within early European film theory (certainly in the 1920s) at large. To name but two particularly prominent theoretical debates of the period: the reflections on the power of the photographic image within French theorizing on so-called *photogénie*[2] by Delluc, Dulac, Epstein, and others; and the predominant role of scientific thinking on the (envisioned) effects of cinema technologies by Eisenstein, Pudovkin, Kuleshov, and others within the Soviet debate on the cinema.[3] Notably, many of the terms belonging to a transnational theoretical debate made their way into Italian discussion, which was coming into its own between the 1920s and the 1930s.[4]

Italian Theorizing in the Interwar Period

Italian film theory followed two main trends. On the one hand, it sought an aesthetic acknowledgment for cinema and related critical and theoretical discourses; in order to accomplish this task, Italian film theory needed to set some boundaries for the discussion by detaching it from practical and professional needs and placing it within the realm of philosophical speculation. To reach this

ultimate goal, film theory demanded to borrow philosophical conceptual tools,[5] forged by the prominent national philosophers of the time. On the other hand, film theory started to define and examine cinema within a media system as an apparatus belonging to modern life.[6] Following these two trends, a good deal of research has been done in Italy in previous decades.[7] In addition to previous research, my aim is to provide a description of the ways institutional, philosophical, and political frames determined film theory in its relation to technology and in its social action. This influence was not exclusively limited to highbrow, academic discussion. Even among intellectuals familiar with the European debate and film production, idealism affected many terms of the discussion. For instance, this was also the case with Enzo Ferrieri (1890-1969). Ferrieri was an active intellectual who played an instrumental role in the then recently created state radio broadcasting system. He was also a leading organizer of cultural journals and film clubs. Nonetheless, by examining his private archive, which contain the texts of his film lectures and correspondence, the influence of idealistic philosophical ideas on Ferrieri emerges rather clearly. I would consider this example as quite telling of a widespread condition of the national cultural debate.

Finally, recent historical research, as developed mostly in Italy and in the United States, focused on modernization processes taking place during the Fascist era, and more specifically during the 1930s.[8] It is certainly not my purpose to deny or challenge these assumptions, which I share for the greater part, specifically concerning production and reception processes. Nonetheless, I would like to partially reconsider these general assumptions by tracing the lineage of theoretical reflection and its idealistic sources, since idealism was quite at odds with modernization. By choosing such a line of inquiry, it is my intention to add some features to Italian film culture identity, which might partly explain the outburst of Italian film humanism in the post-war era as the underdevelopment of a high-tech industry, even though a huge industrial context was surrounding film production and the film market.

Idealist Legacies and the Attitude toward Technology and Science

The theoretical discussion of the technological apparatus of the cinema (*l'appareil de base*) was frequently dominated by accepted philosophical frameworks. This was not very conducive, as Collins and Pinch already indicated.[9] One might say that to Italian film theory the technological base of cinema was a black box. As Bruno Latour explains: "The word *black box* is used by cyberneticians whenever a piece of machinery or a set of commands is too complex. In its place they draw a little box about which they need to know nothing but its input and output."[10] Cinema was mostly discussed in terms of its (aesthetic) effects, barely taking into account its machinery – a word that was disdained itself.

Nevertheless, Italian film theory and the very few remaining traces of technology should be pondered for several reasons, if only because technological progress does not happen as a separated, one-way development, but as a multi-faceted process, where material components, scientific speculation, economic and industrial factors, and social needs continuously overlap. To quote Rick Altman,

> What is utmost needed is instead a theoretical approach that, although fully recognizing cinema's material and commercial nature, could also consider how film art responded in different ways to specific and relevant social functions as needs related to self-representation. [...] In fact, a full understanding of cinema's material and industrial basis implies considering both the existing technological multiple differences (cinematic or not) and their artistic, financial and social ends.[11]

Therefore, I will pay attention to these theoretical discourses because they were part of the collective knowledge concerning cinema and its technology. From this standpoint, dismissing the technology of cinema comprised a major part in this knowledge-building process, leading to peculiar outcomes. As a matter of fact, any scientific discourse in social as in semiotic terms implies a system of presuppositions,[12] i.e., its co-text.[13] I consider Italian film theory and its neglect of technology as a co-text for technological discourses in Italy, or for the lack of their full development in the interwar period.

Early-20th-century Italian philosophy, and specifically Italian idealism, played a significant role within this field in two different ways. On the one hand, two of the utmost influential philosophers, Benedetto Croce and Giovanni Gentile, openly rejected scientific knowledge as partial or false. For instance, Benedetto Croce examined and dismissed scientific concepts as pseudo-concepts, be they empirical (as those elaborated in natural sciences) or abstract (as those produced by mathematics). Pseudo-concepts, he argued, lack the duplicitous quality of real concepts that philosophical knowledge produces: universality and concreteness.[14] Giovanni Gentile in this respect was quite close to his elder colleague, for he, too, saw science as a particular (and limited) sort of knowledge. Both philosophers placed the humanities, i.e., philosophy and art (and history, in Croce's case), at the top of the knowledge processes: philosophy and art unified the spirit as a non-empirical knowledge. This antiscientific attitude originated in a reaction to positivism and the rise of new scientific methods, endangering the legacy of Western European thinking. By taking such a clear stance in early-20th-century national and European culture, Italian idealism determined a specific "knowledge" apparatus, producing elements of knowledge, in the sense of Foucault, as something that must conform to the rules and constraints belonging to a certain type of scientific discourse in a certain epoch.[15] Italian idealistic philosophy, I would argue, is a hegemonic scientific discourse, validating what is to be

admitted and acknowledged. The main reasons for my standpoint are twofold: firstly, philosophical concepts stemming from Croce's and Gentile's works are blatantly present in Italian film theory; secondly, and most significantly, the institutional influence exerted by both philosophers, through cultural institutions and governmental processes, led to an overall reform of school teaching. Giovanni Gentile was a prominent intellectual during the Fascist era; furthermore, he was also Minister of Education in 1922, realizing the school reform that Benedetto Croce fostered. As philosopher Pietro Rossi describes,

> The main polemic target upon which Croce and Gentile agreed was positivist culture, mostly the Italian one. But the battle against positivism also implied refusing scientific culture, or more specifically, refusing a culture in which science played a relevant role. [...] From the very start of the century Gentile was mostly engaged in transforming the Italian school system by declaring the role classical culture was to have in spiritual education, to which school itself must tend, and its supremacy on scientific culture. [...] The school reform was actually not so much "Fascist" – as the regime presented it – as it was inspired by idealistic principles.[16]

The school reform was among the main actions the new political regime imposed on the nation, and contributed in establishing a set of cultural and knowledge values that would endure in the following decades.[17] Among these values were the hegemony of classical culture and the humanities, and the pedagogical role assigned to the state. Fascist cultural politics also appointed intellectuals as mediators between highbrow and popular culture (for instance, cinema), and as educators.[18] In order to instruct the future ruling class, intellectuals ratified and disseminated the main cultural trends implied in the school reform and idealistic culture overall. This is why a new cultural institution, established in 1935 and devoted to the training of film industry personnel such as the people studying at Centro Sperimentale di Cinematografia (National Film Academy), imposed common topics for all students: universal humanities such as history of literature, art history, music history, *and* film history and film aesthetics, these latter two based on the previously established humanities model.[19] Thus, even in professional training technology was conditioned by the humanities, although the national film school and related publishing did contribute to the dissemination of technological knowledge through a series of handbooks.[20] In fact, Italian film theory and critical discourse built a hierarchy of knowledge, placing humanities at the very top, and science and technology underneath, as a necessary evil. To resume a wide range of positions, let us consider Gentile's authoritative statement, which he made in the preface to *Cinematografo* (an influential book in the field of film theory by Luigi Chiarini, who was soon to become the head of Centro Sperimentale di Cinematografia):

> In creation, the universe as an antecedent disappears or, if you prefer, is transfigured: it becomes the artist's world, infinite. *Technique dies down, art begins.* [...] *The problem is solved by overcoming or annihilating technique*; i.e., in representation, as the audience does not see any more the mechanism producing it; and *the man* that the audience sees before its eyes, is alive, not on the screen, but in the world.[21]

As this brief passage shows, *man and life* (as perceived of by humanism, and allegedly classical culture) prevail over technology, which is canceled out and merged in mere art. Technophobia in Italian film theory defines in paradigmatic terms a certain state of interwar Italian culture – in its relation to scientific knowledge and its application – a certain institutional order, and a set of actions spanning two decades.

The Sound of Theory

Regarding the interval of technophobia in Italian film theory between the 1920s and the 1930s two main areas of interest were constitutive: theoretical discourse itself (as explained above); and the transition to sound. Rick Altman already explained how much a specific epistemology – a *crisis historiography* as he called it – may help to understand the way a medium is shaped.[22] It seems to me that the Italian transition to sound may help to understand the contemporary attitude toward technology: 1) the shift draws observers to look at cinema from a historical perspective, forcing them to associate it to different states of being;[23] 2) this incites commentators to ask questions about the medium's technological nature and invites them to include technology itself as a medium's component; and 3) by significantly changing the apparatus's basic technology, the transition to sound in itself enhances cinema's material and technological basis.

The Italian transition to sound certainly created a very prolific and intense period both in terms of theoretical discourse and production. In the early 1930s, experimentation with sound technology in film production flourished, producing very peculiar films such as Resurrectio (Alessandro Blasetti, 1931), La canzone dell'amore (Gennaro Righelli, 1930), or Acciaio (Walter Ruttmann, 1933). Furthermore, technologically recorded and reproduced sound was at the heart of many reflexive films throughout the 1930s, ranging from transnational comedies, such as La telefonista (Nunzio Malasomma, 1932), to international style productions such as La signora di tutti (Max Ophuls, 1934). Nevertheless, these films seldom drew much theoretical attention, and in particular popular comedies were largely neglected, if not overtly despised. Most of the time, theoretical speculation did not directly refer to current national film production, and certainly not at the end of the 1920s, when there was hardly a relevant national film production to speak of. The wide and quite abstract debate

on the rebirth (*Rinascita*) of the national film industry after the bleak crisis of the mid-1920s merged with theoretical speculation.[24] Because of this connection, discourses on technology were very often related to a national issue. For instance, technology became a matter of national primacy in what concerned scientific inventions. To name but one example, in a rarely considered technological treatise popularizing film technology, its author opposes technological Italian imagination to a one-dimensional commercial Anglo-Saxon pragmatism:

> If we cannot be fierce enough merchants in the fight, we would do well to remember that we are Latin: recognizing our infinite genius might be a good idea. Let's draw our competitors into the arena of technique and fight them here, where we also have our weapons and know how to handle them. Let's fight here, where brains are more valuable than dollars. [...] In the name of technique we will be able [...] to win the battle for national film.[25]

In line with this, Fascism financially and politically supported the 40th anniversary of the cinema, and helped to display technology as an outcome of Latin genius.[26] Furthermore, Italian scientific culture seemed reactive to the needs of technological innovation, as a census of patents for color or sound technologies reveals.[27] At the same time, this kind of culture did not get much support, neither in theoretical debate, nor in industrial development policies from the silent era on. As Silvio Alovisio remarks, technology played a marginal role in film discourses, as industrial policies aimed at projecting and producing technology were sporadic.[28] Only rarely did critical and theoretical discourses articulate national issues with regards to industrial research and development: practically, critical reflection did not fully take into account the need for an articulate industrial basis in order to build a national cinema. If they did, they focused on the Hollywood film industry, referring to it with mixed feelings of admiration and despise. For instance, when commenting on THE SINGING FOOL (Lloyd Bacon, 1928), refined intellectual Alberto Cecchi criticized the way technical innovation affected the overall structure by turning film sequences from figuration to representation, from paintings into scenes.[29] On a more positive note, Cecchi also acknowledged the Hollywood film industry's unique achievements, based on the interconnection of industry, technology, and promotion.[30] In Cecchi's seminal view, this combination led to Hollywood's tendency to naturalize representations, narratives, and ethical values.[31] What was at stake was modernity itself, and the social processes that media unleashed. The effects of the cinema were felt everywhere. A quite peculiar intellectual in that era, Eugenio Giovannetti,[32] noted:

> Airplane, automobile, radio, television, cinema, gramophone work altogether in creating and gaining a cosmopolite audience, with an aesthetic and moral

> unity beyond any national boundary. [...] As an effect of mechanical arts, the world is turning into a unitary, limitless artistic democracy.[33]

The effect of technology, eventually feared by the traditional and established cultural organizations, was a loss of inherited privileges. Within this context, Giovannetti's enthusiasm about media induced transformations was largely ignored by his contemporaries.

The advent of sound raised a series of issues concerning technology and its power over aesthetic determination. Italian film theory, as a legacy of philosophical idealism, wanted to see artworks transfigure reality into a renewed form, following the artist's intuition and concept. This (idealist) position was well known and widespread at the time. As Luigi Chiarini observed in the mid-1930s, "cinematic reality, as pictorial or sculptural ones, is not reality, exactly reproduced, but artistic reality, i.e., transfiguration. [...] Every art transfigures in relation to its technique and, therefore, to its expressive means."[34] The most limited this technological capacity remained, the better it was for the expression, as Rudolf Arnheim's influential remarks on sound and cinema outlined.[35] What was at stake was expressive pureness planned by an artist, which sound technology might endanger by adding to representation raw expressive materials. In Italy, Luigi Pirandello was among the first to stigmatize sound cinema, since it dragged the attention of the audience away from representation to technology.[36] But at the heart of the issue is the confrontation between material and ideal elements, and the dismissal of the former, as artist and filmmaker Anton Giulio Bragaglia explained:

> The trouble with sound cinema is the gross spontaneity pertaining to crude sound reproduction of either music or dialogue. [...] The required transmutation and transfiguration of sound images, comparable to visual ones, is lacking here.[37]

Sound technologies led some theoretical accounts to couple sound to stereoscopic technologies. Both technologies were acknowledged for the ways in which they could enhance the resemblance to the real in some ways.[38] Nonetheless, theoretical speculation looked with suspicion at this resemblance, rejecting a key feature of cinematic technology: *mechanical reproduction*.

Reproduction and Animation

Emerging within European theoretical debate in the first half of the 20th century, mechanical reproduction has often served as a rhetorical feature to assess and point out cinema's difference from previous expressive forms, and its belonging to a wider range of media. Furthermore, mechanically produced images often

serve as a *visualization apparatus* in scientific discourse, as Françoise Bastide terms it, meaning that an apparatus's main task is making available to sight what is otherwise concealed.[39] Mechanical reproduction as the technology underlying cinematic representation is a crucial topic to be examined in many theoretical accounts. Nevertheless, Italian film theory systematically overlooked or reduced this fundamental element of cinematic representation. The technological and the mechanical were considered to be sinful qualities that prevented the medium's sanctification as an art in its own right. Italian film theory underestimated the power of photographic reproduction and omitted it from its discursive strategies to the point that most film theory volumes lack illustrations altogether.[40] Photographic illustration, however, dominated the popular film press. The dismissal of the mechanical did not exclusively concern institutional discourses, such as those that took place between the covers of highbrow journals or volumes on aesthetics. Informal discussions on cinema, such as those that took place within film club activity related to the journal *Il Convegno*, also regarded cinematic machinery as a negligible feature. The fact is much more striking if we take into account that the film clubs were screening avant-garde films as well as feature films on a regular basis; films that did not shy away from the technology issue, such as At 3:25 (Paris qui dort, René Clair, 1925), Freedom for Us (A nous la liberté, René Clair, 1931), or Ballet mécanique (Fernand Léger, 1924). At the start of the 1930s, Enzo Ferrieri declared in an unpublished lecture:

> By creating a cinematic rhythm, the director sets himself free from the machine's burden and enters the spiritual realm. Somehow, by being perfectly aware of the machine's value, instead of being subject to his tool, the director dominates it to the extent that he profits from all its possibilities, in order to achieve spiritual architectures of unprecedented beauty.[41]

The films screened in Ferrieri's circle as well as those he referenced consisted of world-famous examples of recent and current film art: French and German avant-garde filmmakers, Georg Wilhelm Pabst, Erich von Stroheim, Rouben Mamoulian, and others. These film choices seem at odds with Ferrieri's idealistic philosophical ideas about film, which provides a clue about the key issue here: the aim was less to enhance and evaluate technology's unprecedented functions in artworks, and much more to dismiss and conceal its role in order to stress cinema's resemblance to the established arts and to include it in their system, within a shared set of values. Such a stance is quite surprising, if we consider that during previous decades the national cultural arena saw the outburst of Futurism and its appraisal of technology, machinery, and new forms of vision. Extensive and in-depth research has been done on the topic of the Futurists and their appreciation of technology, which goes beyond the scope of this chapter and will not be addressed here.[42] However, despite this apparent recognition of

technology that took place prior to the technophobic period under discussion, it seems that Futurism did not truly influence the Italian theoretical debate regarding cinema as it was carried out in cultural journals and treatises; whereas its assumptions were much more influential in other forms of art such as painting and music. Nevertheless, the indirect influence of the Futurists can be traced in film practice, specifically during the sound era. For instance, in terms of motifs, a film such as WHAT SCOUNDRELS MEN ARE! (GLI UOMINI, CHE MASCALZONI!, Mario Camerini, 1932) celebrates movement and the machine: when Bruno's car speeds, it de-figures the landscape and thus emphasizes movement and the machine simultaneously. Similar influence can also be traced through poetic practices, such as sound composing: in O LA BORSA O LA VITA (Carlo Ludovico Bragaglia, 1932) recurring urban noises, as in the opening stock market sequence, foregrounds the technology of sound. Additionally, when film theory in Italy was defined as a discursive field, Futurism was partly institutionalized. If some references to past avant-garde filmmaking survived, this often happened in alternative film practices, such as architecture documentaries or subsidiary films,[43] Cineguf (Fascist university associations) film production, and alternative newsreels (for instance, SETTIMANA CINES).[44] Finally, Futurism itself was often interested in cinema's representational novelty, i.e., its aesthetic and linguistic peculiarity and modernity, however its technological specificity was not necessarily discussed in-depth. In this respect, the discussion on special effects or on slow and fast motion was fully inherited in late 1920s and early 1930s reflection.[45] In this regard, a cynical but interesting note can be found in Ferrieri's remarks, as he discusses the machine in Futurism as a strategy to preserve old mythical structures underneath the surface:

> Considering the "machine" as the only modern source of inspiration, creating the "speed myth," should be nothing but a need to grasp new spiritual contents to replace and banish the old ones.[46]

As with every cultural inheritance traces remain; however, instead of being celebrated as in Futurism, technology was dreaded and molded into a form acceptable to idealistic philosophy. As was the case with mechanical reproduction, technology was seen as an obstacle to the full rise of the film artist, i.e., the film director. The professional role envisioned for the film artist within the constraints of idealistic philosophy and based on the unity of the subject, played a crucial role in Italian theoretical debate.[47] Alberto Consiglio explicitly advocated cinema as an individual art form, and therefore an art in its own right.[48] In order to consider cinema an art according to idealistic philosophy, theoretical debate needed to dismiss technology, specifically the expressive means of technology, and claim an individual creator as a savior. Commentators suggesting that cinema should be considered among the figurative arts[49] were attacked, although

they stayed within the realm of idealistic philosophy: true art does not need any expressive specification.[50]

Photography as a topic was introduced to the debate, but it was barely considered a scientific means to analyze and describe reality beyond the capacities of the human eye. Photography, so closely associated with cinema *did* enter into the Italian debate[51] via the French notion of *photogénie*.[52] Moreover, Béla Balázs's writings, translated into Italian from the early 1930s on, had already spread among contemporary Italian intellectuals. Photography, was understood as a creative resource, a means to realize the artist's intuition by overcoming reality (and its reproduction). Furthermore, photography could grasp the ideals beyond physical appearances. As Bragaglia declared, when describing his Futuristic photographic experiences in the 1910s, known as photo-dynamism (*fotodinamismo*):

> We strived to make photo-dynamism less and less photographic, and to portray more and more dematerialized – and, thus, more and more idealized – moving figures. This is because reality appalls us as a result of its indifference and materiality.[53]

Figuration is privileged over reproduction, as in classical culture and idealism. As Bragaglia declares:

> The more slowly [a gesture] is performed, the less deformed, the more unreal, ideal, lyrical, as extracted from its personality and closer to [a universal] *type* it will be, with the same deforming effect the Greeks sought for their beauty *types*.[54]

Later on Bragaglia opposes photo-dynamism to cinematography (as understood in Marey's scientific research, to whom he expressly refers). One would be hard-pressed to find a more clear-cut opposition between a classical culture, often underlying Futuristic claims, and a scientific one. Figuration appears the best solution available, in order to preserve a subjective creation over the scientific apparatus. And animation fitted perfectly in this frame of thinking. Unsurprisingly, it was praised by some Italian film theorists as the pure essence of cinema.[55] This appraisal concerned early Hollywood animation, such as Pat Sullivan's Felix the Cat cartoons (starting in 1919), but also Europe's first attempts at animation, as in the case of Lotte Reininger's films. As the film critic and future successful screenplay writer Ettore Maria Margadonna wrote:

> I dare to say that pure cinema, the purest, are "cartoon songs." Their main characteristic feature is easy to describe: "cartoon songs" are untranslatable and *non-reproducible*, they are just cinema and nothing else.[56]

Margadonna's words indicate why non-mimetic cinematic models such as "cartoon songs" played a relevant role in the theoretical reflection on the cinema: they were symptomatic of the suspicions and dismissal of the technological basis of film. Nevertheless, after WWII theoretical debate mostly concealed the expressive potential of non-mimetic cinematic models and marginalized them as a subsidiary or minor part in theoretical reflection.[57] Nevertheless, Italian film theory occasionally promoted animation as pure cinema because of its closeness to traditional, non-reproducible art forms, such as miniature, thus proving how much one dreaded the social, cultural and hierarchical shifts film technology could elicit if given free reign. It is by no chance, for instance, that Ferrieri promoted The Adventures of Prince Ahmed (Die Abenteuer des Prinzen Achmed, Lotte Reininger, 1926),[58] a renowned German animation movie based on hand-made silhouettes. The profile of these slim, enchanting figures was decidedly more capable of resembling ephemeral ideals, or miniatures, than any photographed bodily appearance could have been.

Jean-Luc Godard's Histoire(s) du Cinéma: *Cogito Ergo Video*

Céline Scemama

Fig. 1: Chapter 1b, A Single Story, 1'45''.[1]

On Technique, Thought and Beauty

When viewing Histoire(s) du Cinéma (1988-1998), one necessarily asks oneself how, technically, Godard succeeded in bringing such a vast selection of sounds and images into this impressive and infinitely beautiful work. One also wonders from where the bits and pieces of images, phrases, and melodies were taken, even as they vanish and are replaced by others – but this is another matter. We cannot begin to consider the film's poetics – a film about History, which, for Godard, means a film about all stories – without taking into account how Godard, as a filmmaker, puts the techniques of cinema to the test.

Long before this highly atypical film, Godard had always attached great importance to film techniques. In À Bout de Souffle (1960), he used highly sensitive film generally reserved for photographers and the making of documentary films; in La Chinoise (1967), he already thought of using a video camera; he used high-definition video for an unprecedented color treatment in Éloge de

L'AMOUR (2001), and is considering using stereoscopic 3D technology in his next film (ADIEU AU LANGAGE). In HISTOIRE(S) DU CINÉMA, strangely enough, the innovation does not lie in the adoption of any technological novelty but in the way Godard uses methods and processes that are in fact very old – which also lends the film a melancholy and tragic dimension.

What is important here, however, is not Godard's relationship to any state-of-the-art technology. According to him, he had thought of using a video camera on LA CHINOISE, at a time when Sony had no interest in such cameras: "When LA CHINOISE was being made, I'd seen a camera and a video recorder in Philips's window, and said to myself that the discussion in the room between the Maoists could be filmed on video by them and they could then make their *autocritiques*, as the fashion then was."[2]

What matters is not so much whether his interest in new technologies put Godard ahead of his time, as is the way in which he instantly thought of using them to serve his outlook on the times; more than one year before the May 1968 events started in France, he had already made LA CHINOISE. The young revolutionaries he depicts in this film "play at" revolution and, as Shakespeare and TO BE OR NOT TO BE[3] have taught us, there is no incompatibility between "playing" and "doing." Therefore, the kind of theatricality one observes in LA CHINOISE is in fact the most vivid expression of a certain social reality as the artist saw it. Godard was well aware that representation was an integral part of the revolutionary process, and his video camera project – whereby the characters would have been shown filming one another – was meant to emphasize this essential fact.

In HISTOIRE(S) DU CINÉMA, Godard uses old cinematographic techniques – "a wonderful legacy of the past"[4] – and thus experiments in an unprecedented way of conceiving a prophetic work of History, a kind of funeral announcement. For Godard, this means going back to the infancy of cinema as it lays dying. Iris-ins, iris-outs, fast motion, slow motion, superimpositions, old-fashioned fade-outs: HISTOIRE(S) DU CINÉMA integrates all the outdated effects and cinematographic tricks that Epstein used to theorize and experiment with, and that Élie Faure already regretted: "Superimpositions and slow motion effects, which played a fundamental role in the development of our rhythmic and visual education, have disappeared from most contemporary films."[5] Godard is neither conservative nor backward-looking; however, he has never refused a new technical possibility and has always been infatuated by machines.[6] In the manner of pioneers such as Méliès, Lumière, Griffith, and Vertov, he has always experimented with the technical potentialities his art offered. "Technological inventions bring the idea of a new art form. But once the idea exists, [...] it inspires technology in turn, gives it a direction and a specific mission."[7] In this case, Godard entrusts the art of film with a mission that has often been denied: to *think* – and, more particularly, to think "all the stories." And to think, for Godard, means to *see*... and to see implies to *hear*. Consequently, such audiovisual thought cannot be

Fig. 2: Chapter 1a, All the Stories, 44'55''.

dissociated from what is objectively – and hence technically – happening on screen. Even though his transformation of the Cartesian phrase – "*Cogito ergo video*"[8] – is sometimes considered humorous, it is nevertheless a founding principle, a discourse on method.

Are thought and beauty two separate entities? It seems not, as Godard uses techniques to forge his audiovisual material into beauty *and* thought at the same time: "Few pan shots – maybe one high-angle shot, but because a mother is crying over her murdered child"[9] – a phrase that reminds us of Godard's statement from the sixties: "Tracking shots are a matter of morality."[10] What is beautiful is not the represented thing itself, but a form's accuracy with regard to its object – which is why Godard repeats no less than eight times in the film: "neither an art nor a technique: a mystery."[11]

The thought and beauty present in a work of art essentially depend on the employed techniques: technique is everything. On the other hand, technique is nothing without the use one makes of it. An artist makes do and invents new forms with whatever comes to hand: therefore, technique is nothing. Thought and beauty, in a work of art, are the result of a coincidence between materials, techniques and the various ways in which the artist uses them: a mystery, that is, which this article does not pretend to solve but to explore – notably through the analysis of certain film extracts.

Fig. 3: Chapter 1b, A Single Story, 0'14''.

Associated to Greenberg's line in To Be or Not to Be,[12] when quoting Shylock in Shakespeare's *Merchant of Venice* (act III, scene 1): "If you prick us, do we not bleed? If you tickle us, do we not laugh? If you poison us, do we not die?"

Cogito Ergo Video

Godard's version of Cartesian certitude – "*Cogito ergo video*"[13] (Fig. 3) – means: "I think, therefore I see." Consequently, Godard thinks what he shows – that is, what he sees. In other words, his thought never precedes what he sees: "Never decide anything in advance,"[14] Bresson writes. Godard's thought exists only because his sight is focused in a very specific way, and inasmuch as "a mechanism gives rise to the unknown, and not because one has found this unknown in advance."[15] Histoire(s) is entirely based on this principle. We can see Godard's thought take form on screen, as it were, from one shot to the next – although not in the way we see and grasp objects that surround us, as ideas cannot be separated from their mode of appearance: the combination of images, words and sounds. This principle is very much in keeping with another Bressonian precept: "Your film is not readymade. It *makes* itself as it goes along under your gaze. Images and sounds in a state of waiting and reserve."[16] Godard follows Bresson's teachings and respects "the precept: find without seeking."[17] Once in contact

with the associated images, sounds and words, the screen, thus impacted, reveals the unexpected: "It is profitable that what you find should not be what you were expecting. Intrigued, excited by the unexpected."[18] The whole difficulty – "*hoc opus, hic labor est*" [19] – implied by this method is to "Provoke the unexpected. Expect it."[20] To provoke and wait at the same time: a fine paradox, for the artist, which ties in with the other great principle upon which HISTOIRE(S) is based: "A thought that forms a form that thinks"[21] – "to provoke" being the equivalent of "a thought that forms," and "to wait," of "a form that thinks." This phrase is not more rhetorical than Godard's transformation of Cartesian certitude, as Godard's thought does not exist independently from the images that appear edited together on the screen – which amounts to saying it does not exist without the syntax Godard uses to work with his material, a syntax which wholly depends on the instruments of cinema and, in this particular case, of video.

Are video and cinema here considered as two separate art forms? Generally speaking, they may be – and sometimes quite vigorously –, but Godard himself implies no such thing. According to Youssef Ishaghpour, "[...] For cinema to turn in on itself in this way, in this sort of reflection on itself and *its* History – for that to be possible and for the result to become a Scripture, cinema *squared* so to speak, a great work – it seems to me that the existence of video was necessary."[22] And to that Godard answers: "Video seemed to me one of the avatars of cinema [...] I'd say there was no very big difference between video and cinema and you could use one like the other. [...] Video came from cinema, but you can't say now that IT[23] comes from cinema."[24] However, Godard explains that what he realizes in video could not be done through cinema. He also says that,

> HISTOIRE(S) was cinema. Technically it was textbook stuff, very simple things. Of the forty possibilities in the list I used one or two, mostly overprinting to help retain the original cinema image, while if I'd tried to do the same thing with film I'd have to use reverse negative copies and that causes a loss of quality; above all you can alter the image easily with video, while with film all variation has to be preplanned. [...] It was an act of painting. The overprints, all that comes from cinema, they were tricks Méliès used.[25]

Godard's answer is highly significant, especially in its paradoxical aspects. He explains that HISTOIRE(S) is at once cinema and an act of painting, and that video is cinema, even though all that video enables could not be done with film. Two points may be singled out: according to Godard, video is cinema's daughter, or one of its avatars, but the *immediacy* of the mixing and combination of images is – as such – only possible with video. The potentialities of video are compared to an "act of painting" because, in both cases, the artist works with his hands, and, furthermore, the screen may be compared to the painter's canvas receiving

Fig. 4: Chapter 4a, The Control of the Universe, 7'19''.

shapes and colors. Before the form itself begins to think, the artist must think with his hands, whether in the art of film, video or painting.

> The mind is only true when it manifests itself – and in the word "manifest," one hears the [French] word "*main*." [...] It is time that thought becomes what it truly is: dangerous for the thinker and capable of transforming reality. "Where I create is where I am true," Rilke wrote.[...] It is said that some think, others act. But man's true condition is to think with his hands. [...] I shall not denigrate the tools we have, but I do wish they were functional – [...] if it is generally true that the danger does not lie in the tools we use but in the weakness of our own hands.[26]

Thinking with One's Hands (Fig. 4)

Video enables Godard to make a film in a more *visible* and *immediate* way: the editing, fast and slow motions, superimpositions, fade-outs, and so forth, are directly *made* on a set of screens and in a sound control room. It is Godard's hands that think and try out new rhythms and associations, and with his eyes and ears that he apprehends the outcome of this "form that thinks" in its turn: "It is manual work," Godard says. This clearly appears in the film, notably in the

Fig. 5: Chapter 3b, A New Wave, 5'26''. Eisenstein cutting film and Anna Karina:[1] "Beauty. Montage my beautiful care."

passages using reverse, fast or slow motion effects: when Capitaine de Boïeldieu,[27] in slow motion, miraculously rises from the ground after having been shot, for instance, or when a young woman[28] runs toward a door in fast motion and does the same movement in reverse and in slow motion.[29] The latter shot is caught between two shots showing edit benches, which further emphasizes the manipulative process at work. In the film as a whole, Godard shows 31 times the image of a spinning film reel on an edit bench – a film in the process of being edited –, thereby using video to show the potentialities of celluloid film and demonstrate the essential manual dimension of cinema. The most significant shots in that respect are those that show Eisenstein manipulating film[30] – an icon of cinematic thought at work (Fig. 5).

This enables Godard to try out the effects an image, a sound, a word, a title and a bit of dialogue produce when they are brought together. From an infinite number of possible compositions, Godard chooses only one, leaving the fabrication process partly apparent in the completed work. This is particularly obvious when the word "error" appears on the screen:[31] at one point, when alluding to the founder of Universal Studios, Godard first mentions Erich Pommer, but in the next shot, a written phrase appears: "Error – Carl Laemmle" (Fig. 6). He also says:[32] "and Tyrone Power in a romance set in the South Seas – never mind the

Fig. 6: Chapter 3a, The Small Change of the Absolute, 6'53''.

story, so long as it is entitled *Birds of Paradise*."[33] And then, "error" appears on screen again, followed by "Virginia Mayo." And Virginia Mayo herself appears. This happens three other times in the film: Godard leaves the traces of this trial and error, because they show the way he proceeds and how his thought progresses on screen. However, among all the possible solutions and compositions he tried out, he kept only those that appear in the film – highly complex compositions on which are based both an individual thought and a specific art form.

For instance,[34] the expression "dream factory"[35] – which reflects the duality of cinema itself – has a double meaning in this context: the factory one has been dreaming of, a beautiful factory, and, on the other hand, an industrial machine designed for the mass production of dreams. "SUDDENLY": the Russian title card from BATTLESHIP POTEMKIN (1925) creates an interruption similar to the inversion of power represented in Eisenstein's film. The battleship retaliates by shooting at the palace. Eisenstein's three stone lions – one asleep, one sitting, one rising to its feet – symbolize, in three shots, the uprising of the people within a very short period of time, hence mirroring the revolutionary process. Within a few seconds, the people have taken power. But immediately afterwards, Godard says "the Gulag Archipelago" and thereby announces what will follow: the death of Lenin, and the collapse of a dream. "Communism has worn itself out dreaming such factories," Godard says a little later. Schubert's *Unfinished Symphony* – as

Fig. 7: Chapter 1a, All the Stories, 15'37''. Lenin and a shot of The New Babylon.[1]

unfinished as the communist ideal itself – accompanies the images of Dziga Vertov's Kino Pravda until the roll of the timpani announcing Lenin's death. Superimposed on Lenin's inert face – and while the *Unfinished Symphony* still resounds – there appears, in a very quick alternation, the image of women's faces evoking the decadence of a corrupt civilization. Those women – one of whom smokes a fat cigar and occupies a central position – appear as scavengers feasting on Lenin's body. It is most unlikely that the simple juxtaposition of these two images would have sufficed to produce such a powerful effect, but the flickering superimposition gives the impression of a successful attack on Lenin's body launched by the women of The New Babylon (1929, Fig. 7).

Neither an Art nor a Technique: A Mystery

Even though none of all this would be possible without the use of technique, Godard nevertheless rejects the primacy of technique in the foundations of art and thought: "I mean that cinema has never been an art, and even less so a technique. Technicians might tell you this isn't true, but one must bear in mind that the 19th century, which invented all techniques, also invented stupidity."[36] Techniques do not really matter, video is cinema, and "the camera has never

fundamentally changed: the Panavision Platinum is less sophisticated than the Debrie 7..."[37] In fact, nothing is ever predetermined by the artist, that "operator of associations" – "A thought that forms a form that thinks" – but it is such techniques and such gestures that produce the unexpected that appears on screen: a mystery, that is, since whatever objectively appears onscreen neither results from technique nor intention.

"Neither an art nor a technique," says Godard. Of course, such a statement must be put into context, as Godard is probably the last person on earth to not consider cinema as an art form – and even Art itself, as it appears in HISTOIRE (S). However, by going back to the origins of cinema – the infancy of an art form – he brings the mechanical characteristics of the cinematograph back to the foreground. He also refers to the Lumière brothers' prediction, which he explains as follows: "*An art without a future*, a kind warning immediately uttered by the two brothers [...] and then they were misunderstood: they spoke of an art without a future – namely an art of the present, an art that gives, and receives before it gives: say, the infancy of art."[38] An art – Godard calls it an art – that, because it inherited from photography, becomes the most realistic of all art forms. The infancy of art is the promise that art made to life, because cinema, by reproducing life, has a responsibility toward life, and resounds through it: here is another aspect of the mystery.

Let us consider another example[39] dealing with the potentialities of the cinematograph's early techniques – the infancy of an art that promises to fulfill its duty toward the life it is capable of reproducing, and, on the other hand, of an art perverted by its desire to gain power over life itself. Such a thirst for power over life is related to that which realizes itself in war. And such a desire to possess the world is incarnated onscreen under the aspect of another: the desire to possess the body of a woman. Both aspects are systematically interconnected in HISTOIRE(S) DU CINÉMA: every time a threat looms over a living thing, every time humanity is offended, attacked, raped, despised, or worse, pornography fills the screen and the bodies of women become objects of domination. The phrase "Splendor and Misery of Cinema" appears on screen, thereby emphasizing the two opposite aspects of cinema: Eadweard Muybridge's galloping horse, and, later on, Étienne-Jules Marey's flying bird – "splendor," the same sequence repeated over and over of a lion going round and round in a cage – splendor and misery – a pornographic film from the nineteen-thirties (Fig. 8). Superimposed on magic lantern animals, stags appear, along with the phrase "on cinema," and a song by Otis Redding is heard: *I've Been Loving You Too Long* – a sadly ironical counterpoint to the "love stories" shown in pornographic films.

There are no exact words to describe what can be seen and heard on screen while viewing HISTOIRE(S) DU CINÉMA: the combination of many forms and the modalities of their encounters. Maybe this is what Godard has always called *montage*, one that has never existed yet, "like a plant that never really popped out

Fig. 8: Chapter 1b, A Single Story, 28'54''. A pornographic film from the thirties and Rolla *(Gervex, 1878).*

of the ground [...]. People at the time of silent movies felt it very strongly and talked about it a lot. Nobody though really found it."[40] Cinema thus seems condemned to die without having done what it could and had to. Nevertheless, in the dusk of the 20th century, Godard produced this monumental *opus* displaying, like a fireworks display, the full power of film editing. Paradoxically, he uses the techniques of video to discover cinema's most lively mode of expression. However, video – which Godard considers as one of the avatars of cinema – is not used to make a video film but to show – in a state of emergency, before it is too late – in what consists the kind of cinema that fundamentally relies on editing – that is, on associations. And this is a manual work above all else. The whole "mystery" of Histoire(s) seems to rely on the strange balance struck between a thought developed with one's hands and that elaborated with the help of machines.

Translated by Maxime Shelledy

Performativity/Expressivity: The Mobile Micro Screen and Its Subject

Nanna Verhoeff and Heidi Rae Cooley

Informed by a tradition of cinema and visual culture studies on the one hand, and science and technology studies and new materialism on the other, we mobilize Peircean semiotics in order to theorize new media technologies and related practices. Our question is, in what way performativity and subjectivity are central to an understanding of technology. It is our contention that it is in performative and expressive inscription that technologies have cultural, social and historical embedding and meaning. In the following we will explore how the dispositif of mobility, and the fluid spatio-temporality of emergence that we see as underpinning a visual regime of navigation, require that we acknowledge that technologies, practices, and subjects are in a particularly dynamic relationship.

Mobile Subjectivity: Navigation and Findability

In hand and "on," the mobile micro screen defines subjectivity in the digital and mobile present. Not only is it a "window" through which we see, touch, and navigate the world, but it is also a recording device by means of which we document, "share," and understand ourselves as present within our surroundings. Its real-time touchscreen interface invites us to approach the world through layers and streams of data. Concerns for location (i.e., where-ness) and destination become central. And because our devices are nearly always on and connected – cellular service, wi-fi, Bluetooth – our movements, even our gestures, register us as locatable to innumerable others – human, technological, and institutional.

In order to grasp more fully the status of mobile subjectivity, it is crucial to think in terms of performativity (as opposed to use) on the one hand, and expressivity (as opposed to self-expression) on the other. Specifically, our aim is to bring together questions about navigation and findability, which we see as fundamental to the current moment in which a rapidly changing landscape of new technologies of mobility opens onto equally dramatic shifts in the construction and articulation of subjectivity. In this regard, the mobile micro screen functions as a site for thinking about processes of inscription. Inscription, as Bruno Latour has explained, refers to "all the types of transformations through which an entity

becomes materialized into a sign, an archive, a document, a piece of paper, a trace."[1] What is more, inscription defines how behaviors between human and nonhuman actants stabilize over time and how, as a result, actions become routine and by extension also invisible. We grow accustomed to the ways in which technologies shape our interactions and transactions; in the habit of regular use and everyday practices, we forget what this might mean.[2] In light of this mutual inscription of mobile technologies and practices, we are specifically interested in understanding the implications of mobile technologies for subjects who are constructed in the process of negotiating technological affordances, performative agency, and the expressivity that making use of these technologies brings about.[3]

In what follows, we explore the navigational use of the mobile screen. The possibility for the interaction in real-time across temporal registers in augmented reality and navigation apps means that subjectivity is constituted in the act of navigation. Technology affords and constrains how we relate to our surroundings, yet it is in the relation with her surroundings that the subject is positioned. The mobile subject emerges within an ensemble of her physical location and the mobile micro screen interface, her potentially ever-changing geographical location (whether or not en route toward a specified destination), and the various data that she accesses and disseminates along the way. The moment of this articulation plays out through the performativity that is the expressivity of mobile screen practices. We contend that the conditions of mobile subjectivity brought about by performativity and expressivity abides by the twin logics of navigation and findability.

Mobile Subjectivity	
Performativity	Expressivity
mobile technologies (affordances + practices) mobile subject (relations + experiences)	
indexical deixis (present or future)	indexical tracing (that-has-been)
performative acts	expressive acts
destination	where-ness
navigation	findability

Fig. 1: Diagram of the mobile dispositif of navigation.

Augmented Reality: Navigation and the Index of Destination

Because individual agency is materialized through an articulation of the mobile user being active and present "on-grid," her physical interaction with the screen, and the streams of data she produces (intentionally or not) in the process, we posit that mobile screen practices always take place within a mobile dispositif.

This Foucauldian concept has been taken up and developed in French film theory by Jean-Louis Baudry and Christian Metz to provide a theoretical construct of what is often translated in English as the cinematic apparatus, and helps us to analyze the material and spatial specificity of the arrangement within which screens operate and the subsequent construction of screenic subjectivity.[4] Preferring the French term with the Latin root of dispositio, which emphasizes the power of "position," we use mobile dispositif in this context to refer to the spatial, yet mobile arrangement comprised of technology, screen content or image, and subject, according to which the process of "screening" takes place.

For our purpose here we take the navigational interface of augmented reality as the mobile dispositif par-excellence in the digital present.[5] Augmented reality, or AR, refers to a digital mobile interface by means of which "data from the network overlays our view of the real world."[6] Commercial smartphones and tablets today boast AR functionality. In fact, as Jason Farman has argued, AR has become a "key technology" for extending, or expanding, the meaning of a place through site-specific data overlays that appear on screen in real-time.[7] Not surprisingly, many AR applications populate the smartphone's real-time image with commercial information, such as the locations of and reviews for local restaurants or stores. However, other uses for the technology exist. For example, a number of applications present historical and archival information and imagery so that one can experience – touch, even – the past, as it is plotted in the present. Like a living avatar in a game, the mobile screen subject simultaneously navigates on- and offline space. She moves through the city from screen "pop-up" to "pop-up" in a manner much like a treasure hunt. While embedded in the software, the activation of geo-located information on screen in AR requires the navigator to move. AR interfaces show a little map on screen in the form of a compass-like circular "radar" image or perspectivally oriented grid to indicate the various points of interest (POI) around the user according to proximity. It is only when in the vicinity of a POI, and turned in the right direction that the screen displays the location-specific, geotagged content. This makes the image itself a destination, and navigation becomes a tracking of that information.

American Pragmatist Charles Sanders Peirce provides a perspective for interpreting how the mobile subject, with device in hand, "on," and raised for viewing information overlays on the AR interface is constituted in the process of meaning-making. His theorization of indexicality supplements Latour's notion of inscription and allows us to describe more precisely how mobile subjectivity manifests in the digital present. Significantly, Peirce identifies two categories of indexicality: a trace from the past and relational deixis in the present. This logic of classification allows us to account for both the directional gesture that AR invites, if not necessitates, as well as the digital traces that mobile connectivity produces.[8] The affordances of the mobile micro screen – portability, connectivity, location-awareness, and AR functionality, in particular – make it possible to

interpret indexicality as producing a multi-layered temporality, one that includes the future and possibility-oriented temporality of destination as a third category of the index. This is because the device tracks where one has been in relation to where one is going, at the same time it registers text-messaging, image-sharing, and other social-networking practices, not to mention the various data proliferated by Internet searches and mobile application diagnostics.

Looking at the widely familiar apps that feature augmented reality and/or navigation at this moment of writing, such as Layar or Wikitude, we see that when a mobile phone user lifts her device and directs its screen-lens toward some object, she enacts deixis: she points, and thereby, establishes a relational presence of subject and object. The real-time image appearing on-screen frames a referent that is only here and now – in the moment of the instance of framing. The user and her display occupy – identify – the presence of each "now," "here," and "there" in its passing. As film theorist Mary Ann Doane has indicated, deixis is the "purest form" of Peircean indexicality. Proceeding in the manner of a pointing finger, or the "this" and "there" of language, deixis only exists, that is, it only signifies, in the now of its happening. It "evaporate[s]" in the very moment of its production.[9] This is precisely the kind of indexicality at work in augmented reality applications that overlay the real-time image with information by combining the user's gesture with GPS system-oriented data.[10]

We propose the moment of AR's mobile screen gesture to be an index of destination. Not an indexical trace of the past – some that-has-been, e.g., the photographic image – deixis only has a shifting referent in the present. Yet, in navigation this present is invested in the future of "going somewhere," triggered by markers that have been plotted and tagged with GPS coordinates within the spatial field. This scripted trail, organized in and made operational by the programming software and AR interface, harbors a future trace of the forward movement of navigation. This necessitates a different thinking about the screen and its image. Not committed to an end result or a fixed visual representation that might serve as a verifiable document, the AR interface produces an index of emergence – a temporally layered and dynamic product of, and tool for, negotiating place in the present with respect to both the past and the future. AR establishes a set of relations among the here-and-now of the present, the traces that indicate past itineraries or movements through space (e.g., GPS coordinates), and the future, or some destination, toward which a subject is moving in a haptic, performative engagement with space and time. This navigation is in essence a performative cartography, underpinned by a "techno-logic," that simultaneously "gives birth to both space and subject."[11]

"You Are Here": Findability and the Indexical Trace of Expressivity

While the performative cartography that is practiced by means of the AR interface is produced in the act of deictic gesture, it simultaneously produces indexical traces.[12] Beyond the oily residue of one's fingers on the touchscreen surface, GPS coordinates and GSM cell tower data track the participant. This is because the moment of deixis coincides with and, in fact, requires the smartphone's location-awareness functionality. At each moment the device registers location-based information. Our movements through a space are recorded and mapped so as to enable site-specific information in the time of one's movements. The resulting artifacts, recorded as metadata, constitute an index-symbolic relation that documents a device's "having-been" in a particular place at a time so-recorded.[13] Not unlike light "touching" the photographic medium, electromagnetic waves strike a receiver and "stamp" a location into a file. We attribute to such metadata the evidentiary properties we assign to the photograph. We believe that this information "points back" to a time and place.

More than indexes in this conventional sense, these traces of where-ness are likewise evidence of the expressivity of performativity of AR navigation.[14] Expressivity, here, does not mean self-expression. It does not refer to any self-aware, autobiographical "I" who intends to document her movements. Rather we propose that mobility itself is expressive of subjectivity. When one pauses and for how long, where one shifts direction and with what frequency: these instances of change within the navigational context communicate moments of attraction or attention that transpire in the immediacy of the moment before conscious decision factors in. In other words, the manner by which one inhabits the present and the momentum of navigation are expressive of an articulation (i.e., assemblage) between a mobile subject and her device. In the case of augmented reality, when deixis inspires interaction with and movement with respect to the touchscreen, the mobile subject's engagement expresses. The impulse to find the next locative pause, the inclination to screen information overlays on a real-time image, the desire to pinch and swipe the augments that appear onscreen all "speak" through the pause, the gesture, and the resumption of mobility.

The "you are here" icon that specifies a mobile subject's location underpins the cartographic act of navigation, which unfolds in a sustained present that is always positioned toward a future as a possible destination. And because AR's layering transpires according to a person's location as registered by satellite and wi-fi connectivity and GPS tracking, it confronts users with, while simultaneously allowing them to forget, the fact that their devices are both navigation devices and tracking devices. As a consequence, "you are here" renders the mobile subject not simply locatable, and the map/screen navigable, but also calculable and therefore findable. Here, we distinguish between locatability and findability, wherein locatability involves specifying a stable and stationary position or loca-

Fig. 2: Connecting to the past in the present via the AR of Ghosts of the Horseshoe *(December 4, 2012). Pictured: Dr. Susan Courtney and undergraduate AR programmer Andrew Ball. Image: Heidi Rae Cooley.*

tion, while findability names the capacity to access and recombine data about location.

As a logic that underpins governance, findability requires coordinated investments in both locatability and navigability such that shifting patterns of movement and relation, for example, across people, objects, and information, can be identified, followed, and interpreted, and, more importantly, anticipated. Navigation, as a practice of moving through space in relation to site-specific layers of data, produces patterns that can be quantified and used to predict other possible movements. In this way, the mobile subject is always a site of relay, a point of measure, assessment, comparison, and prediction. Because the mobile subject – her navigation through both place and information – is tracked, "patterns of use" always ensure that persons are findable within a population (of people and data) as well as across a physical terrain.[15] This is how navigation and its correlate findability make governance possible. The affordances of the mobile micro screen mean that the techniques of governance are always already implicit in routine practices of mobility.[16]

In this regard, the triangulation of tracking, tracing, and monitoring as pertains to navigation matter. The tracking inherent to the project of findability in-

vests in where-ness (Where is x at any given moment?). Relatedly, tracing, crucial to navigational technologies of destination, concerns outlining trails of movement (What is/was x's itinerary?). And monitoring, an extension and intensification of surveillance, insists on a continuous following (i.e., observation) of mobile entities in the present (Where is x and what data is x proliferating in this and all other – past and subsequent – moments?). While monitoring is not our main concern in this article, it is relevant to mention, insofar as it is the ongoing condition of monitoring that enables tracking and tracing. In the next section, we consider two examples in which tracking and/or tracing figure prominently.

Tracking and Tracing: Between Where-ness and Destination

To conclude, we offer two case studies that exemplify both the twin logic of navigation and findability and the distinction we discern between tracking (searching: the analysis of "where-ness"– location specific and in the present) and tracing (following: the analysis of movement in a trail history, whether it is already the past, or transpires in present, or heads into a future). While the two projects differ substantially in terms of their goals, both revolve around the principle of digital navigation as performative deixis – a making visible in navigational movements through space – and the subsequent layering of past, present, and future. Both raise the question of "where" and "when." Both suggest a status of the image which is emergent in the connection between past and present. Moreover, they position an "I" that is the center of that deictic transaction. They reflexively address How?, in our use of technology, we situate ourselves in relation to past, present, and future.

Our first example is a critical interactive called *Ghosts of the Horseshoe* currently under development at the University of South Carolina.[17] *Ghosts* intends to demonstrate how the deixical gesture as inspired by the AR interface might open onto moments of empathic identification, or in Peircean terms, intellectual sympathy. Featuring the "Historic Horseshoe," the app draws participants into relation with history and historical figures by turning the mobile micro screen into a "window" onto the past in order to bring to visibility the unacknowledged history of slavery that made possible the physical site that many take for granted. As participants traverse the grounds, the app tracks them. At designated locations, it announces the "presence" of a datapoint or augment. In the case of AR functionality, the overlays on the real-time image respond to gesture and touch in order to "fill in the gaps" where institutional history falls short and a general lack of awareness predominates. One might confront an historic photograph of a building, whose degree of opacity varies with the swipe of a finger to reveal how the physical structure before which one stands has been modified. One might encounter the three-dimensional rendering of an architectural "skeleton" of an outbuilding (i.e., slave quarters) that no longer stands. One might come

Fig. 3: Detail of Meridians, *GPS drawing by Jeremy Wood (2006). Image: Jeremy Wood.*

across a textured brick augment, which upon touching, activates an audio recording of the ambient sound of brick-making or the voice account of slave life informed by archival records and performed by a professional slave interpreter.

Ghosts uses the affordances of locative screen technologies in order to transform everyday mobility into an embodied experience that might facilitate a deeper empathy with a past that otherwise is regularly overlooked. For example, it is not just that one imagines in the abstract the work of slaves forming, firing, and carrying bricks and, subsequently, building a wall. Rather, one becomes capable of comprehending in situ and through the "lens" of AR the daily labor done by slaves to create the wall that stands physically before her today. In the process, she relates to the built environment differently. She "sees" a division of labor rather than just an old wall. *Ghosts of the Horseshoe* imagines that at the intersection of a continuously refreshed real-time image, the here and now of a user's deixical relation to her surroundings, and the geo-coordinated ghostly encounter we might find the condition of possibility for thinking differently about a physical

place and the work of history as these intersect in the present. The hope is that such experience might encourage mobile subjects to take responsibility for a legacy that is embedded in a seemingly ordinary landscape.

While this case works with and critically interrogates how we can be reconnected with a complex and layered past, we shift our focus to a work that seems to reverse this directionality: one that uses navigation to inscribe the present with a past whose traces reveal the technology for navigation to be one for recording and writing.

An exemplary GPS artwork is *Meridians* by Jeremy Wood (2006) which shows an aerial image of recorded traces of navigation by GPS superimposed on the landscape, much like a palimpsestic drawing of movements within the landscape.[18] The words that these movements compose are a phrase from Melville's *Moby Dick*: "It's not down in any map; true places never are." The traces of past movements performed by the artist, walking with a GPS device, make up the superimposed lines that shape the words layered on the aerial image. Paradoxically, the artwork emphasizes the ephemerality of movement, while the words can only be expressed by making the emergent "happening" of physical movement readable by the "drawing" of lines. Performativity and expressivity are conflated. For, the artwork makes clear, visual representation, indeed, "needs" the indexicality of the trace as a residue of what was before a deictic present, slanted toward the destination in the future. Tracing, then, is the recovery in the present of the movement in the past toward the future – like a residue of navigation – unlike tracking, which entails the search for presence at a specific time: the pinpointing of position. As such, tracking is about where-ness – albeit in the successive "points" within a trajectory; tracing is about the articulation of the trajectory itself – the line that is established in the movement between the points. The question the GPS drawing raises, then, is about the difference between movement and writing, and stillness and "reading" in the close connection between performativity and expressivity.

What makes these two cases comparable-yet-different is how both track-and-trace the movements of the mobile subject. In both cases, meaning evolves through a present that is future-oriented. The first opens onto a definitive albeit polemical past – a history whose material remains constitute the present site of traversal, or mobility. The second reveals that we leave trails all of the time because of the devices we have in hand. The first takes advantage of this but does not explicitly comment on it, although the trails participants produce appear on the historical map interface. Similar to Melville's poetic observation that "it's not down in any map," the maps of the campus do not "speak" the history that *Ghosts* mobilizes. The lines that appear on the *Ghosts*' map are perhaps less "significant"– literally, they do not signify – than the lines in *Meridians*, but they do suggest/invite possible destinations. *Meridians*, on the other hand, does not directly invoke the (traditional) map. Instead, it does invoke innovative mapping prac-

tices that are implicit in the association with the satellite-view layer that is so significant for digital cartography (made widely known by the Google maps interface) and that the tracking-by-GPS as tool signifies. What is communicated in each instance, however, is substantially different because the first privileges tracking and the second foregrounds tracing.

As social anthropologist Tim Ingold has suggested, a notion of space as being a container for movement and "holding" our presence is a fallacy of the logic of inversion. His "contention is that lives are led not inside places but through, around, to and from them, from and to places elsewhere."[19] In a similar vein, our argument in this essay has been that it is really in the connection "between the dots," within the flow of movement, in the performative act of navigation, that mobile "presence" and subjectivity is created. The rather nostalgic phrase by Melville, indeed suggests that the "map" or image could never harbor the subjective, lively presence of being and going. What is lost is the "true" place – of history and change – that is emergent in practice. Mobile technologies are fundamentally embedded in that logic, a logic perhaps also expressed in Emerson's famous words, that life is a journey, not a destination. This perhaps somewhat poetic philosophy, we hold, is underpinned by the fundamentally material semiotic logic of the mobile micro screen.

PART IV

Discussions: Revisiting the Past

Rethinking the Materiality of Technical Media: Friedrich Kittler, *Enfant Terrible* with a Rejuvenating Effect on Parental Discipline – A Dialogue

Geoffrey Winthrop-Young and Annie van den Oever

Friedrich Kittler, Professor of Aesthetics and Media History at Humboldt University, Berlin, who passed away in 2011, is generally considered to be the intellectual father of the relatively new discipline of media archaeology. Most, if not all of his work was written in an academic German one can safely label as complex, dense, and highly idiosyncratic. Moreover, Kittler never hesitated to be provocative or thought-provoking. Unsurprisingly, he was controversial and often misunderstood. In retrospect, however, most media scholars agree that Kittler is one of the most important media theorists of the past thirty years.

A very early reader of Kittler's work, the Vancouver-based Professor of German, Geoffrey Winthrop-Young, having attended Kittler's early career lectures in Germany as a very young student, developed into an insider with expert knowledge of Kittler's texts, sources, shifts, affinities, and Kittler's "supreme media-theoretical trinity," Shannon, Heidegger, and Turing. He was among the first to introduce Kittler's work to the English-speaking world. His *Kittler and the Media* (2011) provides a concise, yet sophisticated and slightly provocative overview of Kittler's works and is the ideal introduction to Kittler's work, according to many. Additionally, he wrote *Friedrich Kittler zur Einführung* (2005) and numerous essays on German media theory, media archaeology, so-called cultural techniques, and systems theory.[1] He co-edited two collections of essays on Kittler and is the co-translator (with Michael Wutz) of Kittler's *Gramophone, Film, Typewriter* (1999). At this point in time, he is working on *Media, Systems, Spheres*, a book on German (media and systems) theory with special emphasis on Kittler and Niklas Luhmann (among others).

A dialogue with Geoffrey Winthrop-Young on Kittler and media archaeology was initiated by me for the very reason that Kittler's work had a profound impact on the international community of film, media, communication, and cultural

studies; a profound assessment of his impact on the fields of film and media studies could not be missed in this book.[2]

As to the format of this dialogue: it will start with some introductory questions regarding the context in which Kittler was working in an early phase of his career and the ways in which Geoffrey Winthrop-Young became acquainted with him and his work as a student in Germany in the early 1980s. Secondly, some provocative and iconoclastic aspects of Kittler's work will be explored. Thirdly, one of Kittler's crucial terms, "*technische Medien*" [technical media], will be analyzed (in relation to Rudolph Arnheim); and the critique of "technodeterminism" regularly being made against him will be addressed. Fourthly, his relation to, and relevance for, the field of film studies will be assessed more elaborately. Lastly, McLuhan's impact on Kittler's work (if any) will be discussed in more detail, as part of a retrospective assessment of his work.

– Annie van den Oever

How It All Started

AvdO: So let me simply start with stating that reading Friedrich Kittler was for very many years the exclusive privilege of a relatively small community of scholars who happened to be able to read German. As all his readers know, reading Kittler is one thing; understanding him within his context is a wholly different chapter. As you wrote in the opening pages of your *Kittler and the Media*, one simply *must* label Kittler *German*, though the term obviously needs some further clarifications.[3] It seems to me that you, being one of his earlier readers yourself, must have felt that his work was badly in need of a proper introduction to the English-speaking world, and then decided to write the book yourself – *Kittler and the Media* – which indeed is extremely relevant and helpful for the wider community of non-German-speaking readers who want to be introduced to Kittler's complexities and idiosyncrasies with sufficient knowledge of the context in which his thinking developed. Now my question is: when did you start to read him yourself and when did you pick up on him as a tremendously interesting source for media studies?

GWY: I started reading him right after our first encounter in Freiburg in the early 1980s. Reading him was preferable to attending his seminars, which I soon stopped doing.[4] Though I must point out that I was 19 at the time: I doubt I fully grasped what he was trying to say. Reading Kittler was often more a matter of attitude than of analysis; his texts were a cool sound experience rather than a source of critical insight. Also, I recall that I started reading him alongside the new breed of science fiction which soon came to be known as cyberpunk – and to this day this cross-reading shapes my view of Kittler. That said, I did sense back

then that he was of singular importance to the future of *literary* studies. But it was only later, when he had completed the intellectual and institutional move from literature to media, that I began to realize how important he was for the latter.

AvdO: Reading Kittler was cool, as you said. Still is cool, I guess. His first circle of readers were students and scholars. They were German mainly, if not, exclusively. Kittler was German, born and raised in the former DDR. He wrote in German. He taught in Germany, first in Freiburg and Bochum, later in Berlin, at Humboldt University. You already met him in Freiburg, in an early phase of his career, when he was in his late thirties. Could you tell us a bit more about this, also about what you then understood as "his singular importance to the future of *literary* studies" as you just labeled it.

GWY: Let's focus on the second part of your second question and talk about national matters of literature. Kittler started out at the University of Freiburg – Heidegger's lair – in 1963. He initially contemplated becoming either a philosopher or a Romanist but ultimately opted for *Germanistik*, the study of German language and literature (not to be confused with "German Studies"). But *Germanistik*, once the uncontested keystone species in the German humanist habitat, was turning into an anxious, unsettled discipline. Its insecurity was fuelled in part by economic downturns that directly affected the job prospects of its numerous graduates in the teaching profession. *Germanistik*, too, suffered its post-Fordist awakening. On a larger scale, however, it was the inevitable result of the demotion of literature as a medium for national self-understanding and collective *Bildung*. Books and letters were losing ground; inevitably, their slippage affected the disciplines that had grown up around them. Of course this is not a uniquely German development, yet I think it is safe to say that it was felt more strongly in Germany than in most other places because *Germanistik* had been so involved in nurturing a national identity that only later took on concrete political shape. And let's be clear on this: No matter how unorthodox or zany Kittler's analysis of literary texts, his treatment of them as decisive moments of cultural inscription does not stray far from their more established treatment as repositories of value and sources of *Bildung*. Their truth content may evaporate, their hermeneutic illusions may be exposed, but their efficacy and representativeness (and thus their status as privileged objects of scholarly inspection) remain unchallenged.

AvdO: Would you say that in this particular phase Kittler was part of the crisis in *Germanistik* being one of the most prominent disciplines in the humanities which were looking for new approaches, new methods as well as new ways to legitimize their academic activities and curriculum at that point in time? Moreover, would you say that he not only was part of the crisis but also of its solution? In other words, did he change the field in ways which were needed at that point in time?

GWY: I like the way you phrase that: Kittler as part of both crisis and solution. He certainly was prone to exaggerate a crisis in order to raise the profile of *his* solution. But no doubt there was a crisis, a crisis within *Germanistik* that incited squabbles about the necessity to modernize the discipline. The debate was further exacerbated by the delayed acceptance of the extent to which the discipline had failed under the Nazis to uphold the values it claimed to convey. Enter Kittler. He wasn't overly concerned with values, politics, or disciplinary history. In *his* student protest days the proletariat took a backseat to Pink Floyd. He had little interest in any socio-emancipatory-oriented overhaul of the discipline. Yet in hindsight it becomes apparent that he was engaged in a similar enterprise. He, too, wanted to modernize the study of literature, but he advocated the archaeology of its discursive and later media-technological layers and protocols. To me, this was no less a bid for relevance than attempts to infuse the study of literature with a more explicit socio-emancipatory agenda. Nobody will ever label Kittler a Marxist (though he could on occasion express a faintly Althusserian approval of the structuralist tendencies of the older, post-Parisian Marx), but his techno-Foucauldian agenda struck me as an equally strident attack on the bourgeois blather of academic routines. And it infused some of those who read and followed him with no less of an anti-establishment feeling.

However, the great irony is that Kittler thereby gave the very discipline he attacked and later abandoned a new lease on life. Before he left the house of books and letters for that of numbers and codes, he shook it up. He broadened the theoretical dimensions of literary studies by introducing so-called French theory; his insistence that literary works must be studied alongside handbooks, diagrams, manuals, and programs extended the range of disciplinary objects; and his technological bent prepared the gradual transformation of parts of German literary studies into *Kulturwissenschaften*. No doubt all of this would have happened without him, but he happened to have been there at the pivotal juncture, so give the man his propers. As we know, academia and the real world operate differently. In real life, troublesome children make their parents age faster; in academia, an *enfant terrible* often has a rejuvenating effect on parental discipline.

AvdO: Would you say that *Germanistik* developed into *Literaturwissenschaft* which was not only broader than *Germanistik* (and *Philologie*) but also different in that it quickly developed a keen focus on theoretical and comparative issues – and then helped to give birth to the newer field of *Medienwissenschaft*?

GWY: Yes, all that applies. And with regard to Kittler there is a peculiar irony. While he contributed his share to the broadening of *Germanistik*, the discipline also imported many of the North American approaches that fall under the blanket heading of "cultural studies" – and which Kittler himself was quite averse to,

and which at times did their share to delay or distort his North American reception.[5]

Kittler as Iconoclast

AvdO: I have been traveling and reading and rereading Kittler, as well as your work on him and temporarily felt paralyzed by a fear to either sound smug or too ironic when addressing one of the main topics – or worries – in a question to you. Nevertheless. As to my worries: the topic of the war and media; his obvious provocations; Kittler and women – his full-fledged misogyny, as many feel. Of course you have already addressed them all in your last chapter of *Kittler and the Media*, and elsewhere.

GWY: ... and while we're ticking off the trouble spots, let's add his views of the achievements (or lack thereof) of certain cultures located to the east and south of ancient Greece...

AvdO: With regard to the gender issue: would you say it has harmed the relevance of his work as a media scholar with a keen interest in power relations to have neglected this one point?

GWY: Yes, but the harm arises from analysis and attitude, not from neglect. The gender issue is all over *Discourse Networks* and related texts. In fact, in this particular context neglect is a charge that should be directed at Kittler's readers rather than at him.

Let's deal with one example: *Discourse Networks* describes the "Discourse Network 1800" as composed of sexually closed data-processing circuits in which women have been relegated to the outside positions. Women inspire men to write texts for and about women that are professionally commented upon by male critics and philosophers and then read by women who are thereby inspired to be women who inspire men to write texts for and about women – and so it goes round and round and round in feedback cycles until the advent of analog media brings about an epochal rupture. But women do not write. They provide input and receive the output, but with very few exceptions (and the only exception Kittler describes in detail, Bettina von Arnim, comes across as a slightly unhinged wild woman, which strikes me as yet another male fantasy) they are excluded from processing and transmission. It's a very elegant construct brimming with all the masculinist techno coolness and bravado that has become a trademark of the Kittler effect. It effectively transforms cultural dynamics into a cybernetic circuit. Yet like all such constructs it entertains a somewhat tenuous relationship with historical reality. Did women really not produce literature? Kittler

concedes that they did so "from time to time," but if you take the trouble to research matters or engage with the type of feminist scholarship Kittler tended to avoid, you'll soon learn that the number of women writing was much higher than this cavalier concession indicates.[6] However, for well over a century nobody talked about them. Kittler too mistakes the *ex post facto* silencing of writing women for their *de facto* absence.

This not only a matter of lacking historical knowledge. The problem is also that the quantitative discrepancy calls into question Kittler's basic description. If, as some of his truly brilliant analyses have it, language acquisition and textual production were gendered to the point of extreme segregation, then how are we to account for the many women who are writing like men? And by the way, what is their social background? And that of the men who wrote? This "Discourse Network 1800" is a very bourgeois affair, and the bourgeoisie is, of course, that part of society that has perfected the skill of never naming itself to ensure that no alternative to it can be named either. But do its practices deserve to mark a total epoch? Kittler is not so much neglecting gender as class. That, however, appears to be a common affliction these days.

And yet. Think about it. We have here, produced in the late 1970s and early 1980s in Germany – that is, before the arrival of *Genderwissenschaften* (an awkward Anglo-German paste job necessary because the German language does not distinguish between sex and gender) a thorough analysis of the discursive construction of gender identity and performance that in many respects was so ahead of its German times it was almost North American. For all its failings and masculinist crankiness, it contained so much that could have been used for further discussions. But just as it takes two to tango, it takes two to break off a dance. Yes, regarding the gender issue Kittler often deserves to be taken out to the woodshed, but the blame also falls on those of his readers who should have known better than to ignore the potential of his arguments.

AvdO: On a more positive note, regarding his productivity and enduring relevance for the humanities: it seems to me that Kittler was utterly important in pushing literary studies into a new realm by addressing the communication media from a new and different perspective, assessing the materiality of the media, analyzing media as *technologies*, studying them with a keen eye on the hardware, thus pushing the field in the direction of a science of the media. Would you agree with this?

GWY: Absolutely. To put it in alliterative shorthand, Kittler was instrumental for the move from content to channel, materialism to materialities, hermeneutics to hardware.

AvdO: As to his study of the hardware, of the media technologies: would you say that thanks to the Kittlerian enterprise perhaps, as you already seem to suggest above, cultural studies should not be confused with German *Kulturwissenschaft*. In a similar way, media studies should not be confused with the Kittlerian and German brands of media *sciences*. There is a profound difference between these fields and approaches, generally speaking. Kittler "*technologizes* and extends Foucault" as you wrote.[7] He gave Foucault's epistemic regimes "a historical footing."[8]

GWY: Let's talk about Foucault. Or rather, Kittler's Foucault – a rare creature different from the flashier Foucaults bred and raised in North America. Not even the English language has enough words to capture the many facets of Kittler's treatment of Foucault: veneration, continuation, revision, implementation, deconstruction, occupation, vindication, sublation, redemption. There's admiration bordering on worship – think of Kittler's obituary of Foucault,[9] in which he describes how he used to await Foucault's next book like the steps of an approaching lover, or how he froze in silence the only time he ever came across Foucault in person. There's respectful updating – there's nothing wrong with Foucault's elegant dismantling of discursive epistemes, Kittler argues, but they must be grounded in a similar dismantling of the materialities of communication and they must be carried passed epochs when people no longer write. And there's a slightly smart-alecky, incipiently parricidal patronizing – he, Kittler, knows what Foucault is *really* about, or what he *really* should have done.

To understand the latter it is important to keep in mind that when Kittler is referencing Foucault, he primarily has in mind the Foucault of *The Order of Things*.[10] (When the older Kittler goes Greek, his references to the older Foucault's take on Greece are decidedly less flattering.) The impact of *The Order of Things* on Kittler is not only due to the book's indisputable qualities, it also has to do with two crucial points that go beyond Foucault. As you know, Foucault describes a sequence of discontinuous epistemes that forestalls the ongoing presence of a central entity around which history evolves. It precludes continuity and thus the emergence of a grand subject. This, of course, brings to mind Heidegger's equally discontinuous *Seinsgeschichte* or history of being. Indeed, especially in his later publications Kittler indulged in ever more explicit claims that Foucault was, as it were, the canniest laborer toiling in Heidegger's vineyard.[11] Second, every episteme has to be analyzed in terms of discursive protocols, orders of speech, conditions for the validity of statements, and so on. This implies among other things that whatever is factually said must be seen against its unsaid possible alternatives. And this – Kittler would now pile on his famous adverbs – is simply, clearly, naturally, obviously, self-evidently a discourse-analytical redescription of one of the basic axioms of information theory. In short, Foucault was great not only because he was Foucault but also because he was a bit like Heidegger and Shannon.

AvdO: And they were the other two gods in Kittler's universe?

GWY: There were so many gods in Kittler's pantheon, and sometimes even a goddess or two... But just as in some strands of Hinduism Brahma, Vishnu, and Shiva reign above the rest, Kittler's supreme media-theoretical trinity is, arguably, composed of Shannon, Heidegger, and Turing. And serious *Medienwissenschaften* should be located between and around those three.

Technē and Technodeterminism

AvdO: I think Kittler's explanation of the crucial difference between *technische Medien* or "technical media" such as photo-, phono-, and cinematographic media, and other communication media, such as language, is highly relevant. In his words: language operates by way of a "symbolic grid" which requires that all data "pass through the bottleneck of the signifier,"[12] whereas *technische Medien* – the analog technological media – process physical effects of the real.[13]

GWY: Yes, he frequently supports this with Arnheim's famous quote which states that with the arrival of new (analog) media "reproductions are not supposed to resemble the object, but rather guarantee this resemblance by being, as it were, a product of the object in question, that is, by being mechanically produced by it."[14]

AvdO: He cited Arnheim's words to point at a crucial quality of the technologies which mediate photographic images, moving images, and sound: mechanically speaking, they produce an object with a resemblance to the object represented within the limits of the technology used. By implication, the technical media need to be understood in relation to art and aesthetic styles in a new and different way. First of all, because the data need not pass through the bottleneck of the signifier. And secondly, because the data contain the inevitable inscription of the technical medium itself. In your shorthand: "Arts give way to media; aesthetical styles are replaced by technical standards."[15] Would you say that these pivotal insights regarding the differences between media and their implications have been made sufficiently productive in the fields of art and media studies so far?

GWY: I am tempted to respond in the negative. It has nothing to do with ignorance, that is, with not understanding the distinction. People are fully aware of the difference between paintings and photos and, by extension, between (artistic) styles and (technical) standards. I hope I am mistaken but I sometimes sense that many theorists are afraid to foreground this distinction because they may end up being charged with technodeterminism, which is a bit like being covered

in cat poo. I hope I'm wrong. But in any case, like any precise insight this one has a precise expiry date: namely, the subsequent arrival of digitally enabled simulation, which makes possible the lifelike rendition of a non-existing tree in ways that are indistinguishable from the reproduction of a real tree.

AvdO: As to technodeterminism, there seems to be something distinctly cyclical about this, meaning that the impact of new "technical media" experienced by many at the moment of introduction (say, television once broadcasting started, or the computer) sets in motion a new cycle of interest in technology (e.g., McLuhan; Kittler) with renewed complaints about technodeterminism. Would you agree there is a cyclical aspect to this, a reoccurrence of certain phenomena both on a technoperceptual as well as on a theoretical level?

GWY: I'm going off on a rant here because I feel very strongly about this. Kittler's texts – and the same applies to McLuhan, Harold Innis, and Vilém Flusser – are like Caravaggio paintings. There is a stark, often perturbing distribution of light and shadow. It is difficult enough to make sense of this chiaroscuro without adding the damn technodeterminist bogeyman. Technodeterminism – to be precise: the *accusation* of technodeterminism – is one of the most pathetic yet unfortunately also one the most handy devices in the vast arsenal of intellectual dishonesty. It is a gratuitous and more often than not misinformed mixture of ideological moralizing (to be a technodeterminist is, somehow, a politico-moral failing) and supercilious laziness (now that I have determined that *X* is technodeterminist, I can happily disregard *X* and go back to sleep). When you hear the T word, remove your gloves.

But back to your point: Historically speaking, technodeterminism is in part a discursive transfer from the realm of economics to that of technology.[16] Especially in the 1920s the arguments aimed at the alleged economic determinism of Marx were redeployed against theories that appear to smack of technocratic engineering, a change of target that both drives and feeds off a flattening of the term *technology*. The logia is dropped, as it were, leaving a very mundane and trivial view of technē as something big and ugly with lots of knobs, levers, and blinking lights.

However, I like your idea that technodeterminism – be it euphoric or apocalyptic – is also an undigested residue of the initial impact with a powerful new technology. What makes your point so pertinent to Kittler in particular is the fact that it is central to the design of *Gramophone, Film, Typewriter*. People tend to overlook that this reputedly arch-technodeterminist manifesto, which begins with the apodictic pronouncement that "[m]edia determine our situation," is heavily invested in literature and the literary construction of media technology. As he states at the outset, Kittler inserts and relays texts from the period of the initial encounter with analog media, when even "obsolete media" like books exhibited a sensitivity

for new technologies "and the terror of their novelty," which we, having grown accustomed to them, have lost.[17] Of course Kittler quickly adds that these stories cannot replace a history of technology. You are not going to gain a technical, medium-specific understanding of phonography by reading Rilke's "Primal Sound" and its speculation on what sounds would emerge if you used a phonograph needle to "play" the coronal suture on a human skull. But we sense what is going on underneath Kittler's procedure. These early literary texts stake out the epistemic and experiential domain of the theory to follow. The flight path Hegel's owl of Minerva follows at dusk was in part explored and plotted at dawn by Apollo's and Aphrodite's twittering sparrows. We need a media theory that in order to break the narcotic spell imposed on us by new media must be commensurate to the sense of fright and wonder we experienced when we first encountered them.

AvdO: Moreover, would you say that Kittler, an active participant in this cycle for some time, chose to push the topic a little by fearlessly and purposefully provoking his opponents as a fierce anti-humanist, a scholar in the humanities who, contrary to most scholars in his field, passionately and polemically wished to focus on *technology*, not humans, when addressing major questions of the humanities regarding communication and representation?

GWY: No doubt about it. There is – especially in Kittler's media-theoretical writings – not a single important concept that is not also a fighting word. In feisty German: *Kittlers Medientheorie ist eine Theorie der Kampfbegriffe* [Kittler's media theory is a theory of fighting terms]. And the supreme fighting word is, of course, *media*. It is so difficult to determine what on earth Kittler means when he uses the term because he has it operate in three different registers. First, it denotes a new *object* of study – say, the typewriter. Second, it denotes a new approach to established objects – the study of literature within a Remington discourse network of mechanical text production. Third, it is a kind of constant accusation which refers less to anything Kittler is saying than to everything others are *not* saying. It polemically highlights what has been overlooked, suppressed, or concealed by "soul," "subject," "man," "spirit" (a.k.a. *Geist*) and all the other nebulous entities at play in the humanities that Kittler loved to preface with his trademark term *sogenannt* ("so-called"). Media occupy the center of the humanist blind spot.

Kittler and Film Studies

AvdO: Would you say that Kittler was a productive thinker also in the field of film studies?

GWY: I doubt it. Isn't the film section the weakest part of *Gramophone, Film, Typewriter*? Kittler himself thought so. *Optical Media* is almost an act of atonement.[18] On a very basic level, Kittler struck me as a man of sound and temporal sequence, not of sight and visual composition. "Hold on," readers will say, "film is every bit as much a temporal sequence as a phonographic recording; it is subject to the same time-axis manipulation that is so central to Kittler's approach to media. Film, too, is an instantiation of machine time." Agreed. But I think it's advisable when tackling the Kittler/film issue to recall Frank Hartmann's diagnosis:[19] There is a moment of almost Kantian distrust of images in Kittler, which may or may not be part of his Lutheran heritage. Some passages in *Optical Media* read like belated contributions to the 17th-century word-based Protestant campaign against the image-based Catholic Counter-Reformation.

AvdO: Kittler as an iconophobiac, that would indeed make sense to me. For one, it would help me to understand why I was so terribly disappointed by Kittler's (online) lecture on "The Relation of Art and Techne," given at the European Graduate School in 2005.[20] I already knew the etymological connections between the two words, art/technē, thank you. So could we proceed beyond that, please. But Kittler did not. Not really. Though the connection between arts and technology does still need some serious attention. For one, I take it that the genealogies of art and technology are intertwined in many ways, moreover that it is symptomatic that, historically speaking, debates on the relation amongst poets, artists, and cultural critics (Baudelaire and Benjamin were once among them) recur every few decades, at the very least. These seem to indicate that new technologies – and optical and visual technologies perhaps even more than the others – may affect viewers in all sorts of interesting ways, creating a different perceptual or aesthetic experience which may have a sudden and strong impact on the imagination, particularly of those who are sensitive to the visual, to images. In other words, should we not simply expect the art world to have responded to technological and particularly optical inventions over the centuries? As the avant-garde artists of the 20th century have shown repeatedly, experimenting with all sorts of ways to transform perceptual experiences, if only temporarily, etc. In other words: I had high expectations of the lecture. When I saw it, though, I was really disappointed. It is cliché in part, unintelligent in part, repetitive and... the provocative remark on Warhol makes Kittler suddenly sound like a petit bourgeois on avant-garde paintings that "my kid could do better"...

GWY: ... and there's the swipe at Locke's "incredibly dull essay on *Human Understanding*, the entry of commercialism into philosophy." Trust Kittler – who nonetheless had an anglophile streak – to resurrect the good old continental view of the English as a nation of shopkeepers whose contributions to philosophy amount to glorified bookkeeping...

AvdO: I always thought this was Kittler on an off day.

GWY: Annie, I am afraid there is a fundamental divide between Kittler and yourself that no deliberation on my part is going to mediate. But you are voicing a discontent many have expressed concerning this particular lecture (and related pieces), so it's worth trying to probe what Kittler is saying. Why he is so dismissive of contemporary techno- and media-artistic endeavors? (Yet before we begin: in fairness to him, he is squeezing material covering two thousand years of history into a 50-minute lecture delivered in his third or fourth language. It is no coincidence that he now and then slips into French. *Il parlait beaucoup mieux le français que l'anglais.*)

This is the big cinemascope narrative: Once upon a time under a bright Aegean sky there was a notation system, the Greek vowel alphabet, which was successively refunctionalized in such a way that it was able to encode linguistic, mathematical, and musical data. This pristine unity fell apart, and the various arts and media formats developed their own notation systems. Speaking dialectically, it is precisely this differentiation that allowed for their progressive mathematization and technologization. At one point, and it first occurred inside Alan Turing's cranium, the ability to unite the various media formats was regained by means of digital computation. Step 1: Unity. Step 2: Differentiation with attendant specialization. Step 3: Unity on a higher level. *E unibus pluram, e pluribus unum.* For all his disavowal of Hegelian teleology, Kittler is telling a story that comes with strong Hegelian residues.

Now, it is this story that provides the algorithm for the distribution of praise and disdain. Worthy of praise are those artists who – like Brunelleschi, Alberti, or Vermeer in the realm of painting – are at the top of their game because they push the mathematization and geometrization of their art. Worthy of praise are those who – like Wagner and his projected *Gesamtkunstwerk* – push the reintegration of media formats. And worthy of praise are those who – like Pink Floyd in "Brain Damage" – use the art form or media format they work in to stage and reveal its current technological underpinning. Given this basis for evaluation, Warhol does not qualify for any praise, on the contrary. From Kittler's point of view, Warhol is adopting a fancy artistic pose by simply sponging off a medial effect with little understanding of its technological conditions. He is doing very little with a lot of attitude. Nowadays any PC can do the same with far less fuss. And computers – to return to the question of images – do not operate on the level of images, they merely use them to stoop to inferior human operating levels.

AvdO: Indeed, though, you make me wonder all over again whether visual art in fact was *not* a thing he understood, he could experience, could take in? Is there a deeper lack of concern with visual art? Perhaps with optical technologies? And also with film, with the cinema?

GWY: It's difficult to diagnose. My suspicion is that on top of the admitted inability to discuss images on the same level as acoustic phenomena, there are two other points. First, remember that Kittler did not invent German media studies. He was not the first to seriously scrutinize non-literary media in an academic setting. *Kommunikationswissenschaften* (communication studies), once known as *Zeitungswissenschaften* (newspaper studies), had been around a long time. And *Filmwissenschaften* (film studies) were already on the go when Kittler headed into media. Indeed, there have been recent attempts to show that German media studies started in and with film studies. Forget Kittler, forget the Frankfurt School, forget communication studies, the real point of origin is said to have been the arrival of the video recorder. Kittler, however, saw the bulk of film studies as nothing but literary studies applied to film. Sure, you could read Christian Metz et al., add a layer of structuralist sophistication and rhapsodize about alternating syntagmata, but for the main part films were treated as texts on celluloid. The accessibility of the image invited elaboration of the content at the expense of more medium-specific issues. This apparent hermeneutical appropriation, I believe, biased his perception of the medium itself. Whether that is a fair assessment of the film studies he encountered is a very different question. Kittler was prone to pontificate in rather one-sided ways on disciplines he disliked. Think of his parochial dismissal of US-style cultural studies.

Second point: Lacan. As you know, Kittler related film to Lacan's imaginary. But the imaginary is a Lacanian register Kittler does not take kindly to. It is no coincidence that he sometimes treats film as the technical implementation of text-based reveries cooked up in the "Discourse Network 1800" – which we cannot simply surrender to.[21] To put it bluntly, in terms of Lacan's tripartite division Kittler's media theory aims to send the imaginary out to pasture in order to secure an undisturbed fruitful intercourse between the real and the symbolic. This bias results in – I hesitate to call it laziness – but a certain reluctance to move beyond the Lacanian playground when dealing with film, that is, the imaginary. He is much better when discussing the real (phonography) and the symbolic (typewriter).

AvdO: Kittler's ideas of film studies and Metz's theorizing in particular were already so outrageous and outdated when he presented them back in the 1990s that it would be unproductive and irrelevant indeed to respond to them in 2013; instead, let me address some remarks on Kittler's perception of film. You label film studies as one of the disciplines Kittler *disliked*. That obviously would be in line with his assumed lack of affinity with images and the imaginary. Interestingly, connecting the two was exactly what Metz tried to do in *Le Signifiant imaginaire* [The Imaginary Signifier].[22] Coming from phenomenology and structuralist linguistics and having already explored the productivity of studying film in terms of a language, a grammar, and a time-based art driven by narration in "La grande

syntagmatique du film narratif" and other works, he then went on to explore how the considerable impact of film images on the viewer's imagination could best be understood.[23] In his apparatus theory, Metz basically explored the productivity of framing the problem in terms of an apparatus (*l'appareil de base*), which could produce and project film images that, under circumstances specific for the cinema *dispositif* (and while concealing the apparatus, which was needed to create these effects), were able to affect and often even captivate the viewer's imagination for the duration of a movie. In other words, Metz addressed some fundamental questions triggered by the medium as he had come to understand it, as an "apparatus," and at the same time he explored the productivity of a new theory of the imaginary for the field of film studies. Now let us say neither images nor the imaginary were Kittler's cup of tea. He was not interested in these aspects of the film medium (or in a dialogue with Metz). Obviously, this was bound to affect his relevance for film studies in the long run. Perhaps we should go even further and say that it affected his relevance for media studies overall, as images and the visual and their impact on viewers form such a substantial part of media history, of media's impact on culture, certainly in the 20th and the 21st centuries. Do you agree?

GWY: I do. But he wouldn't. And the reason is related to a feature of the image we have not yet addressed. Kittler's reluctance to fully engage images and their cultural impact is not only a matter of personal proclivity. It is not only a residue of Lutheran or Kantian *sola scriptura*. Neither is it only a matter of discontent over content-based film studies. It also has to do with the technical fact that in many ways the image, which in your description comes across as an ontological entity, is a surface and/or interface phenomenon. Computers do not communicate images to each other but their digital encoding. In contrast to numbers, images are, as it were, a kiddie language, a primitive vernacular adopted by computers when they stoop to our operating levels. Kittler was so taken by the Dürers, Albertis and Brunelleschis because their grids, veils, and diagrams were earlier ways of generating images from projective geometry or other mathematically oriented cultural techniques. Mediated images are numbers in their Sunday best – impressive, representative, seductive – but they do not reside on the operating levels that media theory has to access.

This directly affects your question whether Kittler's relevance as a media theorist is hampered by the fact that he did not adequately address images and their visual and their impact on people and culture. Your question is based on the premise that such impact studies are central to media theory, but that is not how Kittler saw *Medienwissenschaften*. Regardless of the fact Kittler provided some ingenious insights on how media inscribe people, he would insist that media theory's principal concern is the historically informed study of the ways in which changing media structures or discourse networks store, process, and transmit

data. On a bad day in the early 1990s he would have added: Let sociologists worry about human impact.

AvdO: When we go back to his 1999 Berlin lectures on optical media, we see that Kittler typically approached cinema as a time-based medium.[24] One of his central questions was the impact of film on "the ancient monopoly of writing" and the new ways in which authors (and certainly writers of fiction) were forced to compete with film and cinema, which were to alter the status of books. Kittler was interested in these "media wars." He was interested in the analysis of power relations. In many ways, Foucault was his model, as you already explained. Like Foucault, he was discourse-oriented. Moreover, he successfully inspired a focus on the materiality of media. He helped to lay bare the epistemological structures underpinning studies in the humanities. He helped to open up the field for media studies. How exactly do you assess Kittler's attention for the materiality of the medium with regard to this? I mean to say, the aura of the traditional discipline of archaeology in many ways rests upon the aura of the objects, that is to say, direct empirical contact with all these curious material leftovers of past centuries. Contrary to fieldwork in archaeology as a traditional discipline, which takes a lot of long hours of sweating under the Mediterranean sun on one's knees, Kittler seemed to shy away from field work for months on end, from empirical contact with the objects, perceptual experiments, hands-on research. Nor did he often resort to sharing his knowledge in a dialogue with, say, the Philips or Blaupunkt engineers, who did perceptual experiments with optical devices for five decades. You used the words *reluctant* if not *lazy*... A preference perhaps to fool around in the discursive playgrounds he already knew? Trained as a philologist, he was a man of books, he was effective with words. They did the job. In retrospect, we may conclude that he successfully helped to construct media studies in the humanities. This has changed the field. That critical project as such, as a discursive enterprise, productive as it was, has come to an end. And now? Must we not leave that playground and move on? Include the material objects, as archaeologists do, to construct hypotheses, test theories, substantiate claims. Talk to engineers. Study their experiments. Study the historical leftovers of the *l'appareil de base* in the archive. Endure long hours under the hot sun?

GWY: But in fairness to Kittler, isn't that like taking the speed of supersonic jet planes as the norm for air travel and then dismissing old propeller biplanes for not being fast enough? They were a heck of a lot faster than the hot-air balloons they replaced. Go back to the 1980s and early 1990s, when institutionalized media theory was in its infancy. How many "media theorists" apart from him studied synthesizers, assembled their own switchboards, made an effort to master mathematical information theory, and learned and even taught basic computer programming? No doubt the engineering sections and software experts within

today's media studies (and the fact that they are now *within* this discipline is part of the Kittler effect) can easily expose Kittler's gaffes and reveal his textualist bias, but in his day he was ahead of the curve. He had earned the right to ridicule academics who pontificated about media technology but could not explain the difference between a vacuum tube and a microprocessor – and boy, did he make use of that right.

The irony is that what you recommend for the future of media studies (sensibly, I think) is what others perceive to be one of the most lamentable aspects of Kittler's impact: the tendency to indulge in mind-numbingly tedious artifactualism, in which (let's run alliterative amok) the analysis of algorithms, the diagnosis of diagrams, the exegesis of electronics, the probing of programs, the scrutiny of switchboards, is seen in itself as an inspired act of real media-theoretical critique with God knows what kinds of ramifications. I think he sensed the danger of the increasingly self-enclosed tech-focused sterility he had helped create. The whole late-career shift to love, the Greeks and the protean glory of the multifunctional vowel alphabet, the attempt to show by close reading of the gospels that Jesus was crucified because he was the Linus Torvalds of his age, the philological meticulousness employed to reveal Saint Paul as the Great Apostle of Pneumatic Vowels, not to mention the close reading of the *Odyssey*'s Siren song as a Homeric discourse on discourse channel conditions – isn't all this also a return to a textual critique designed to counterbalance some of the effects of his earlier work? Kittler's oeuvre, like Foucault's, is continuous by reacting against itself.

Kittler, McLuhan, and Estrangement

AvdO: Would you consider Kittler a pupil of McLuhan, and if so, possibly his brightest one, as Thomas Elsaesser once said in a 2011 conference in Montréal hosted by André Gaudreault and Martin Lefebvre?

GWY: I have difficulties with the label "pupil" if it implies the dependence, continuation, and/or indebtedness that constitute pupil/teacher relationships, even if they never shared a room. Derrick de Kerkhove is a pupil of McLuhan's, Kittler is not.

AvdO: To provide a bit more of a context to you: Thomas Elsaesser and I were in fact talking about the branches which sprang from the McLuhan school, and Canada of course saw quite a bit of offspring and followers... And not only Canada. It was within this context that he suggested that the much later work on remediation by Bolter and Grusin springs from that same Canadian tree – but that Kittler was the more brilliant (or most brilliant) scholar to pick up on McLu-

han's work. Who would not agree? If one only allows an evocative and productive thinker as McLuhan to also present some mistakes and underdeveloped thoughts, one must still value his work and acknowledge the revolutionary and evocative force of his thinking, the productivity and relevance of his insights. The pivotal question is not: What smaller mistakes did he make? or Where is his thinking underdeveloped? But rather: Where did he really miss the point? And the same goes for Kittler of course.

GWY: Indebtedness to McLuhan – Kittler's or anyone else's – is a tough topic. It requires that we identify what McLuhan said, which is not an easy task. It also requires that we move beyond the bipolar mood swings that have dictated our evaluation of McLuhan. Historically, McLuhan's ideas were like a highly fertile layer of manure spread across a wide array of approaches and disciplines. We did not like the smell, we did not care for many of the ingredients, so we were happy to forget the fertilizer when harvesting and eating the products. But after decades of disdain some are now approaching the other extreme by turning McLuhan into the fountainhead of all modern media theory. Yet McLuhan himself was a bustling relay station drawing on many sources. The bigger the pedestal we put him on, the more it obscures the view of those behind him, including Innis.

But let's lay the groundwork for Kittler/McLuhan. The main and obvious similarity is the programmatic rejection of message in favor of medium. When Kittler analyzes Pink Floyd's "Brain Damage" as a "discourse on discourse channel conditions," he is saying that the message of the song is its own medium. It's McLuhan's mantra with a Franco-German accent; and both are riffing off the basic information-theoretical tenet that organization is information.

The main dividing line, frequently drawn by Kittler, is anthropocentrism. For McLuhan (to quote the standard objection which is also the famous subtitle) media are "extensions of man." Of course, if you read McLuhan you quickly discover that he has a keen, quasi-Kittlerian eye for feedback processes in the course of which media work over their human creators, as in the famous case of the driver becoming the servomechanism of his car. But regardless of what hybridizations it may lead to, this prosthetic logic has its point of origin in the human body and nervous system. From Kittler's point of view, McLuhan still subscribes to the anthropocentric delusion that man is the measure of all media, even when the latter reshape the former. This has obvious implications for the ways in which the theories handle the media/senses nexus. McLuhan is interested in how media affect the sense ratios of pre-given senses, Kittler is interested in how media and senses mutually emerge and map each other – you only understand the latter in terms of the former. That is one of the red threads of *Gramophone, Film, Typewriter* and the second part of *Discourse Networks*. In short, McLuhan's media theory has the tendency to inch toward a theory of perception; in

Kittler's case, the question of human perception enters as a contingent by-product of media.

So far, so unproductive. But let's push the envelope. One of the great concerns of the older, Greek Kittler was that "media make sense when media make senses." Translated into a discourse accessible to modern mortals: Under the right circumstances (e.g., *Magna Graecia* in Southern Italy, around 400 BCE), using the right epistemic objects (e.g., a cithara) and the right notation system (the Greek vowel alphabet simultaneously acting as a numerical and thus musical notation system), and performed in the right spirit of love, music and numbers, interacting with these media and multifunctional sign systems will allow us to enter a domain – rephrased in Black Forest lingo: will grant a truth event, an unconcealing of being – that we have been missing out on ever since prudish, tone-deaf, and mathematically ignorant Athenian philosophers started to clutter our unfortunate minds with lumbering ontological distinctions like form and matter, soul and body, glowing ideas up there and base things down here. Is there not a basic similarity to McLuhan in the sense that media theory is to break the narcotic spell of mindlessly accepted media environments to open up a richer experiential domain? You're the expert, so I submit to you: Isn't McLuhan's media-theoretical update of the Formalists' *ostranenie* a bit like Kittler's take on Heidegger's *aletheia*?

AvdO: This is a very interesting connection indeed. The point which many media scholars missed in the post-war era is that perception – as in McLuhan's and Kittler's media theories – was also a key issue for the so-called Russian Formalists, who, ironically, were wrongly labeled since "form" was not their concern.

GWY: If I recall matters correctly, we have Trotsky to thank for the label "formalism," which is as misleading as "technodeterminism." Maybe "perceptualism," though equally ugly a term, would have been better.

AvdO: The Russian Perceptualists – that label would indeed have been spot on for the Shklovsky circle. They focused on "ostranenie" (making strange): that interesting phenomenon that foregrounds new techniques (in art, in Shklovsky's case) that turn the normal into the strange; percipient viewers/hearers keenly and readily take in the "strange" in a perceptual process which is notably slowed down, complicated and deepened, as Viktor Shklovsky explained in "Art as Technique."[25] He did not use the words technology or medium since he was inspired by the poetry performances his friend, the poet Vladimir Mayakovsky, provided in the early 1910s. Interestingly, Mayakovsky's model was the new cinema machine, which, as he had been quick to notice, created strong effects in viewers by making everything look strange. Strange and evocative, just as Mayakovsky's own "Futurist" performances would soon become: this tall poet recited with a radish

in his buttonhole, making strange gestures and using lyrical as well as silly words and nonsense; thus, he typically created an "art experience," as Shklovsky already explained in 1913. Similarly, *new* media technologies are able to de-automatize the perceptual process and create a prolonged (art) experience of things "as they are perceived and not as they are known."[26] Automatization and de-automatization of perception, conceptualized by Shklovsky in terms of the art experience, obviously provide a basis for a media theory that helps to explain (media) sensitization and desensitization, moreover, why media effects first are strong, then disappear. Why is all this interesting material for media scholars? Because it helps to understand how we relate to old media. Being desensitized to them means that the initial sensitivity to the medium's technological makeup vanishes as the strangeness effects wear off due to automatization (or *algebraization*, as Shklovsky also called it). This inevitably leads to a decrease of sensitivity to the distorting powers of these once new techniques to the degree that viewers become almost fully insensitive to them. It automatically leads to a point where the presence of techniques in the perceptual process is not noted anymore: a swift shift from medium to mediated may become not only habitual, but even natural or "second nature." Just note how we relate to television. Interestingly, this also suggests that the twin mechanisms of de-automatization and automatization help to constitute the fields of art *and* media respectively, and that the two are inherently connected. Art is made for, and experienced by the senses, whereas media are simply there to be used. A medium is a means that functions only when it steps back, as media phenomenologists keep repeating.[27] Nevertheless, it is a fundamental problem for media studies that media technologies are easily overlooked. In other words, that automatization renders them transparent, thus facilitates a dominant research focus on the "real," not on the medium. That is the realist fallacy in research: desensitized to its effects, realists basically leave the medium understudied. Overlooking the medium is a recurring phenomenon in the humanities. McLuhan always had my sympathy for the very reason that he put perception and the materiality of the medium back on the research agenda after WWII in evocative and provocative ways. As Kittler did some decades after him. There is something cyclical to it, don't you agree? Shklovsky, McLuhan, and Kittler provided (media) theories in the three major new eras that marked the 20th century: film, television, and computers. Their theories forced a focus on the materiality of the medium. All three had to provoke their readers. They had to break (as you wrote) the narcotic spell of the mindlessly accepted (old) media environments they found themselves in. And each of them indeed had a keen interest in the richer experiential domains created by new media technologies and art. But they are relevant for the field in different ways. There are things their theories can, and cannot do. If you had to indicate to your students how these (media) theories can best be made productive, including some clear instructions and warnings and an implementation schedule, as a pharmacist would on a med-

icine label, what would you write on Kittler's label? (I am not so sure you would want to write the McLuhan label...)

GWY: A label? Like on a medical ointment? How about: "Handle with care. Do not only apply to sore spots but also to allegedly healthy parts of your body. Warning: *This product will not cure you of any disease, only of your mistaken belief in the healing power of other ointments.*"

But seriously: your remarks on art, media and estrangement – which deserve a discussion of their own – make me think of a book-length interview from 1996 that was republished on the occasion of Kittler's death.[28] Kittler (we touched upon this in connection with Warhol) was not too fond of discussing video and computer art – a reticence that some of his critics in the academic art scene will neither forget nor forgive. My sense is that he viewed these discussions, if not the art objects themselves, as attempts to recycle under a souped-up technological veneer bygone notions of artistic subjectivity and romantic creativity. But in this particular interview he is pretty talkative. As if to illustrate your point – that is, the refunctionalization of a media technology in order to arrive at new, unexpected, "rejuvenating" performances that let us *re*-experience hitherto somnambulantly accepted media environments – the interviewer mentions scratching. In violation of established technological and artistic presets and standards, turntablist scratching is an abuse, an estrangement of analog recording technologies for the purpose of generating new sonic experiences. Kittler responds by pointing out that the corresponding phenomenon in his generation was the way in which performers like Jimi Hendrix or Syd Barrett took technology out of the hands of the technicians and corporate employees and started to fiddle with amplifiers, controllers, feedback circuits, and so on, and then made this technoexplorative experimentation an integral part of their music. We all know the Kittlerian mantra that rock music is an abuse of army equipment. This would be a case of double estrangement, the mind-altering abuse of an abuse.

But then he moves on to the computer, and things change. Indeed, how do you estrange a universal machine? What new stuff can you do with a machine defined by its ability to simulate and replace all the old ones? Ridiculing some of the more rambunctious instances of computer art, Kittler says that of course you can throw a computer out of the window and hope for a pretty result. But what comes of that? Kittler: "Nothing comes of that, that's simply destruction. Ultimately, it will come down to programming, in the course of which you automatically operate on the level on which the apparatus is constructed."[29] In ways which undermine the liberating, distancing gesture we associate with estrangement, beneficial abuse is already programmed into that which is to be abused. The divide between analog and digital, then, is expressed in terms of differing estrangability (in Brechtian German, *Verfremdbarkeit*). Or, to phrase this the other way round: the potential for estrangement, the very possibility of *ostranenie*, is

radically altered by changing technological environments. In the digital world – and it is imperative to hear the political undertones of this argument – resistance is futile if it is located outside of the machine. In ways that come close to ideas Flusser developed in *Towards a Philosophy of Photography*, resistance involves working *inside* the machine *with* the machine *against* the machine.[30] "With numbers," Kittler wrote, "everything goes."[31] And that, I guess, includes their own estrangement.

Revisiting Christian Metz's "Apparatus Theory" – A Dialogue

Martin Lefebvre and Annie van den Oever

French film theorist and critic Christian Metz (1931-1993) is well-known for his "apparatus" theory, which he developed in the 1970s. His works, in English translation, had a major impact on international film theory: *Language and Cinema* (1971), *Film Language: A Semiotics of Cinema* (1974), and *The Imaginary Signifier: Psychoanalysis and the Cinema* (1977).

Martin Lefebvre is the only researcher to have accessed the entire Metz archive of the Bibliothèque du film (BiFi). He is a Québécois film scholar, editor of *Recherches sémiotiques/Semiotic Inquiry* (RS/SI) as well as Professor and Concordia University Research Chair in Film Studies (Montréal, Canada). As Director of the Advanced Research Team on the History and Epistemology of Moving Image Studies (ARTHEMIS), he is interested in the theoretical and epistemological changes in the field of film and moving image studies over the decades, hence his interest in Metz, who played a crucial role in making film and cinema studies part of the academic curriculum at universities in Paris in the 1970s and 1980s. As he was aware that BiFi housed a Metz archive that had been bequeathed by his son, Michael Metz, after his father's passing in 1993, Lefebvre was given permission to get a glimpse of the archival material in 2008-2009 while he was working on the history of the Filmology movement for a special issue of *Cinémas: Journal of Film Studies* he was editing with François Albera.[1] He knew Filmology had been important for Metz and wanted to see if any traces of it could be found in the Metz archive. Though the archive is difficult to access since it is not yet catalogued due to staff shortages at BiFi, and impossible to photocopy for legal reasons, nonetheless, Lefebvre realized it was a substantial archive and decided to seek legal authorizations and some research funds from the Social Science and Humanities Research Council of Canada thus enabling him to consult the entire archive (close to 45 boxes of materials). Since 2012 Lefebvre has been doing research in the Metz archive as part of his work on the history and the epistemology of film and moving image studies. In an upcoming essay for *October*, co-authored with Dominique Chateau,[2] Lefebvre used Metz's personal notes (e.g., quotations from his study of Mikel Dufrenne's *Phénomenologie de l'expérience esthé-*

tique) to re-evaluate the role phenomenology played in Metz's conception of cinema and in his theoretical work. Furthermore, the archive contains unpublished manuscripts, which Lefebvre intends to edit and make available for public use. One of those, a conference paper from 1971 on the relation between semiology and aesthetics ("Existe-t-il une approche sémiologique de l'esthétique?") will be published in issue no. 70 of *1895*.[3] Lastly, some of Metz's seminars will be edited, annotated, and published in the coming years.

In the context of this book on cinema and media technologies and while reassessing the research done on it, a dialogue with Martin Lefebvre on Metz and "apparatus" theory was initiated by me for three reasons: first, apparatus theory marked Metz's (and the field of film studies') pivotal shift from a linguistically oriented study of film to theorizing the technologies of the cinema and their impact on viewers; second, the archive allows a new assessment of the context from which apparatus theory emerged with the help of materials that were not open to research so far; and third, Metz's theory needs to be revisited and reassessed in terms of the new interest in film and media technologies today, to determine if and how Metz's premises, concepts, and findings could (or perhaps should) be made productive in current research. In other words, there are historical, theoretical, and epistemological arguments to want to revisit Metz's work of the 1970s. As to the format of this dialogue: it will start with some introductory questions regarding the archive and Martin Lefebvre's first impressions of Metz's personal notes. Secondly, Metz's relation to Baudry will be explored as he played a crucial role in the (intellectual and political) context in which the first notes on the apparatus were written. Thirdly, crucial insights from Metz (in part diverting from Baudry's, who seems to have been more ideologically oriented) will be assessed in more detail. Lastly, Metz's relevance for the field today will be discussed.

– Annie van den Oever

The Metz Archive

AvdO: If you allow me, here are some introductory questions regarding Metz's archive before we reassess Metz's "apparatus theory." What made you want to revisit and rethink Christian Metz's work?

ML: Metz's name, as you know, is synonymous today with the rise of modern, truly academic film theory. Metz, of course, was a die-hard structuralist and in the current climate where scholars are starting to historicize film studies and film theory, I thought it important to look at Metz with a fresh pair of eyes. Indeed, there has not been much *historical* work done so far on the structuralist moment in film studies. In a sense, therefore, this is a form of disciplinary inward-looking. However, I also realized, as soon as I opened the first box in the

archive, that this inward-looking was more personal than I thought. You see I initially came to film studies through Metz and semiology and though my work moved on to the philosophical *semeiotic* of C.S. Peirce (I'm still a card-carrying semiotician!), working on Metz, on his archive, was also a way for me to reflect on my own connection with what I do as a film scholar and teacher of film studies and on what got me interested in *film studies* (and not just in films) in the first place.

AvdO: And what are your first overall impressions of his archive?

ML: As we speak, I have not completed reading all the materials I have gathered from the Metz archive. In fact, I've only had a few months to peruse the materials. I can tell you, for instance, that there are hundreds of "film reviews," which are often 1 to 2 page summaries of films Metz had seen. He was indeed an avid moviegoer, seeing several films a week, and all sorts of films: American blockbusters, classical Hollywood and French films, European art cinema, Asian films, etc. In an age before IMDb and the web and before DVDs, these notes obviously served the role of *aides-mémoire*. And yet, one also finds interesting – if short – aesthetic judgments in them.

AvdO: There was a conference on Metz in Zurich in June 2013.[4] Did you present some of Metz's personal notes and "reviews" there?

ML: Indeed, I did – as part of a larger work on Metz and aesthetics – though it's too early to say at this point if one can establish a "Metzian canon" or, better yet, a "Metzian aesthetic" from the notes he kept on the films he saw. Nonetheless. I did notice he was especially attentive to the "worldly" aspect of narrative films, the settings – for instance, the Vienna of Ophuls's films. Moreover, the archive also contains some of Metz's scholarly reading notes. Very copious notes on Sigmund Freud, on Rudolf Arnheim, on Jean Mitry, and several other authors he read. Again, these were principally *aides-mémoire*: the notes tend to follow an author's argument very closely. However, there are occasional critical asides and reflections, e.g., the notes on Mikel Dufrenne's *Phénomenologie de l'expérience esthétique* are especially interesting. Some of the asides in these notes ended up almost verbatim in his first published essay, "Le cinéma: langue ou langage."[5] These and other documents also helped me re-evaluate the role phenomenology played in his conception of cinema and its role in his theorizing. One also finds there the galleys for *Le Signifiant imaginaire* and for his unpublished manuscript *L'esprit et ses mots. Essai sur le Witz* which is a sort of dialogue with Freud's work on *Witz* [the joke] but doesn't concern cinema.

AvdO: Does the archive reflect Metz's position in film studies in Paris back then?

ML: Absolutely. The archive is in itself important as a *document* of the French film studies scene. Because Metz kept every thesis report he ever wrote, it is fascinating to see how at one point the entire milieu of French film studies (and sometimes beyond) gravitated around him. An almost entire generation of scholars was either supervised by him or had him sit as a jury member for their doctoral defense. Same thing when I look at the list of people who either attended or gave presentations at his seminar (Michel Marie, Roger Odin, Michel Colin, Alain Bergala, Raymond Bellour, Dominique Chateau and François Jost, Jean-Paul Simon, Jacques Aumont, Dana Polan, Francesco Casetti, and so many others).[6] For several years he was literally at the center of the field and therefore had a large role in shaping it.

AvdO: In fact, "film theory" as such seems a term disseminated from the 1970s onwards.

ML: The term, of course, originated with Canudo, though Eisenstein used it sparingly. As for Metz, he uses it in the 1960s.

AvdO: As an inspiring theorist who liked dialogue and debate, Metz seems to have been at the center of film studies, which, at the time, was internationally still a young and quickly growing field of studies. His presence was felt in our country too, where he had close friendships with Eric de Kuyper and Emile Poppe, whom he knew from their doctoral studies in Paris; they wrote their doctoral dissertation with Greimas and Metz was part of their jury. After this, De Kuyper and Poppe initiated film and performance studies in our country in the late 1970s. They received Metz regularly at the (now Radboud) University of Nijmegen and devoted a seminar to him and the apparatus theory in 1980.[7] His first visit should in fact have been one he would have made together with Stephen Heath, but Metz had to cancel and was replaced by his assistant Michel Colin. Did he take personal notes of those visits, the debates he took part in, these seminars, the theses he read?

ML: De Kuyper attended Metz's seminar and in *L'Énonciation impresonnelle* Metz mentions his film A Strange Love Affair (co-directed with Paul Verstaten in 1984). However, there are no traces, no summaries of debates in Nijmegen or elsewhere in the archive. I can tell you, nonetheless, that his first visit to Nijmegen was in October 1986, where he gave three talks: "Jokes, after Freud. Some Remarks, Some Examples"; "Photography and Fetish"; and "Questions and Answers about Film Semiology."

Conceptualizing a Theory of the "Apparatus": Baudry and Metz

AvdO: Considering the shift in Metz's work in the 1970s, my impression is that, coming from a background in phenomenology and structuralist linguistics and after having explored the study of film in terms of a language, a grammar, and a time-based art driven by narration (in "La grande syntagmatique du film narratif" and other works),[8] Metz went on to analyze the best ways in which the considerable impact of film images on the viewer's imagination could be understood. From his publications in *Communications* in the 1970s, one gets the impression that Jean-Louis Baudry may have played an important role in Metz's shift from studying film in terms of a grammar to conceptualizing the cinema experience in terms of an apparatus, a *dispositif*. Now my question is two-fold. First of all, what was the impact Baudry had on Metz's theorizing of the cinema in terms of an "apparatus"? Was he in fact a starting point and an inspiration to Metz? Second, was the direction of Metz's thinking in the end not crucially different from Baudry's, in that Metz was far less discourse-oriented, less political, less ideologically oriented than Baudry (and many of their Parisian intellectual contemporaries, for that matter), if only because Metz's primary concern was *not* the analyses of the power relations inscribed in the cinema apparatus but rather the unveiling of the mechanisms and processes working on the cinema viewer's imagination?

ML: Before I answer your question, I think it's important to mention that although Metz was trained as a linguist, he was not formally trained as a philosopher and therefore his interest in phenomenology was not *technical*, say, unlike Husserl and his followers. Also, the move from linguistics to psychoanalysis as a model to think about cinema was not a *break* for Metz. Sure, it opened up new objects and new perspectives, but Metz saw them as complementary with his previous "filmo-linguistic" work. Common to both is a concern for language and the symbolic. And in France at the time, both could be joined under the umbrella of structuralism.

Now, the issue of Metz's relation to Baudry is a complicated one. Baudry was not a "professional" scholar but a novelist who earned his living as a dentist. Of course, he was also a member of the Tel Quel group between 1962 and 1975, along with Julia Kristeva, Philippe Sollers, Marcelin Pleynet, and Jacques Derrida. In reading *The Imaginary Signifier* next to Baudry's essays, I've always had the impression that Metz's overall argument was more subtle than Baudry's. Of course, Metz, who knew Baudry well (theirs was a relatively small intellectual circle), speaks highly of him (in *The Imaginary Signifier* he mentions Baudry's "remarkable analyses" and adds that he sets up the problem of Freud's optical metaphors "very well");[9] and it's obvious that he saw an ally in him (Baudry ended up ded-

icating his book, *L'Effet cinéma*, to Metz in a collection, *Ça cinéma*, edited by an ex-student of Metz's, Joël Farges).[10] Yet, at the same time, there are only five very brief allusions to Baudry in *The Imaginary Signifier* and, more importantly perhaps, they hardly have anything to do with the problem of ideology or power relations *per se*. Baudry, let us recall, worked on two fronts at once, combining, like Althusser, Freudo-Lacanian psychoanalysis and Marxist ideology critique. And it is chiefly around the issue of ideology that, it seems to me, Metz was more careful than Baudry.

In the heated post-'68 context, it was Marcelin Pleynet, who, if I recall correctly, first launched an attack on the *apparatus* (*l'appareil*) – understood here chiefly as the camera – that *determines* cinema. In an interview conducted in the third issue of the very political journal *Cinéthique*, Pleynet explained that before any discussion regarding the political content of a film, or questioning their militancy, filmmakers (and critics) should question the ideology produced by the camera itself: "the cinematographic apparatus is a properly ideological apparatus, it is an apparatus that disseminates bourgeois ideology before disseminating anything else. Before it produces a film, the technical construction of the camera produces bourgeois ideology."[11] The culprit, it seems, is the "perspectival code directly inherited [and] constructed on the model of the Quattrocento's scientific perspective."[12] The camera, is "scrupulously constructed to 'rectify' any perspectival anomaly, to reproduce in its authority the code of specular vision as it is defined by Renaissance humanism."[13] A year and four issues later, *Cinéthique* published Baudry's first essay on cinema: "Effets idéologiques produits par l'appareil de base" [Ideological Effects Produced by the Basic Apparatus].[14]

AvdO: The Parisian post-'68 context – which you label as "heated" – certainly was deeply political, and the critical focus on ideology must in part have sprung from that context. An attack on the camera as an ideological "apparatus" or as part of an ideological "apparatus" as Pleynet articulated must have fitted into that context quite well. Would you say that Marcelin Pleynet was important for Baudry in this phase?

ML: Pleynet is briefly referenced by Baudry, and it is hard to miss the connection between the claims of the two Tel Quelians regarding the camera (*l'appareil*) and its ideological effects, with Baudry adding a key psychoanalytic turn to the argument. Perhaps a terminological note is in order here. The French word "*appareil*" (apparatus) has been in common usage to designate the camera (among other things) since 19th-century photography. However Baudry is, at least at first, somewhat equivocal in his use of the term. In the 1970 article, he includes under it all the "technical" aspects and machinery of filmmaking (indeed his diagram for *l'appareil de base* also includes the script and *découpage*, the film stock, montage, the projector, the screen, as well as the spectator); and yet, throughout the

piece he especially emphasizes the role of the camera. In the second essay of 1975, he tries to clarify the situation by stating: "In a general way, we distinguish the *basic apparatus* (*l'appareil de base*), which concerns the ensemble of the devices and operations required for the production of a film and its projection, from the *dispositive* (*dispositif*) which solely concerns projection and which includes the subject to whom the projection is addressed. Thus the *basic apparatus* comprises the film stock, the camera, film developing, montage considered in its technical aspect, etc., as well as the dispositive of projection."[15]

AvdO: Was Baudry important for Metz in this early phase?

ML: There is no doubt that Baudry's work often overlaps with Metz's own findings, sometimes preceding them as in the case of his discussion of "primary" and "secondary" identifications, of the mirror-stage analogy, of the cinematic construction of a transcendental subject/spectator. And, in turn, it is likely that Metz's early work also had an impact on Baudry: the latter's idea that cinema is a machine that "represses" its film frames (and shots) was stated by Metz, though in non-psychoanalytical terms, as early as "Le cinéma: langue ou langage" and served to some extent to ground the development of the *grande syntagmatique*. Did Metz share his ideas with Baudry while he was working on the essays that make up *The Imaginary Signifier*? According to Raymond Bellour, they saw each other "semi-regularly" in those days, and it is Metz who requested Baudry be invited to submit an article to *Communications* 23. Metz himself published his first two psychoanalytical articles in that same issue. Metz and Baudry tread very common metapsychological ground: analysis of the cinema's impression of reality, of the dream state and regression of the viewer caught in a situation of reduced mobility and heightened visual attention, a critique of idealism or idealist film theory, etc. And yet, beyond the commonalities and points of contact, there are also some real differences. Perhaps this was what Metz had in mind when he mentioned in passing, in *The Imaginary Signifier*, that he was following Baudry "obliquely."

AvdO: Where do Metz's and Baudry's analyses of the apparatus become distinctly different enterprises?

ML: Beyond obvious small variations in theory and beyond the equally obvious fact that Metz's psychoanalytic intervention in film studies is meant to cover much more ground than that of Baudry, there are more distinct differences. When we consider Baudry's two essays, we find him trying to make two separate though related points: 1) the cinema, through its basic apparatus, creates a "phantasmatization of the subject" as transcendental ego by calling on Quattrocento perspective and by repressing what it does technically, i.e., by repressing

the difference between individual film frames and, therefore, enabling narrative continuity. The effect of which is to "transfer" this continuity onto the viewing subject, maintaining it "whole" or "unified" and therefore maintaining the idealism that dominant ideology requires (namely the notion that consciousness is independent from its objects and from social relations); and 2) the idea that the success of this apparatus rests on a specific *desire* whose *assouvissement* requires, within the apparatus, a specific dispositive (*dispositif*), one akin to that described by Plato in his myth of the cave, but also by Freud in the *Traumdeutung*. Baudry describes this to be a regressive desire for an earlier moment in psychic life where perceptions and representations are undifferentiated, a form of wish-fulfillment fantasy that mixes perception and representation: one where real perception paradoxically turns into the perception of representations (rather than offering itself as the perception of reality). This second point, of course, is very close to Metz's own analysis of spectatorship. Now, as I mentioned earlier the key distinction between Baudry and Metz concerns the social sphere (ideology), or better yet, the relation between the "symbolic" and the "social" and Metz's caution with regards to the way they interact and coalesce. But there is also a second important difference which concerns the place of phenomenology in Metz's argument. Let me begin by this second point.

As Dominique Chateau and I have tried to show,[16] Metz spent his entire career finding ways to accommodate phenomenology and semiology, including when semiology merged with psychoanalysis. In an unpublished book manuscript, Metz even referred to *The Imaginary Signifier* as a work of "phenomenological psychoanalysis" – a claim Baudry would certainly *not* have made regarding his own work! Metz's analysis of spectator identification, the analogy with the Lacanian mirror, the study of the scopic drive from Sections III and IV of *The Imaginary Signifier* are in fact a reiteration, through psychoanalysis, of the phenomenological argument first given a decade earlier in his paper on the impression of reality ("A propos de l'impression de réalité au cinéma").[17] The same terms of reference are used: the specificity of cinema as related to its perceptual regime, its uncommon perceptual richness, the fact that it nonetheless gives us shadows instead of "real" objects, the comparison with theater, etc. Like Baudry, Metz claims that the spectator is led to misrecognize himself as the transcendental ego of Husserlian phenomenology. This leads to a critique of the idealist-phenomenological tradition in film studies for being blind to the deception it falls prey to, for failing to recognize the alienated nature of the spectatorial self as subject of pure perception. And yet – and here Metz distances himself considerably from Baudry's analysis – just like the ego (in Lacanian terms) *cannot escape being deluded* in front of the mirror, Metz argues that *without the transformation of the spectator's perceptual consciousness into a "false consciousness" (the latter translating itself phenomenally in the spectator's alienated consciousness as cinema's impression of reality), film would be incomprehensible*. The point, then, is not so much to politically *combat* alienation (the

"mirror effect ") as to explain it, to see its function in the overall experience of cinema (at least narrative fiction film). Perhaps this is also a way to disarm it, but not so much to denounce and oppose it, since this would amount to oppose the pleasure film brings which is the source of Metz's writing. Interestingly, this is how Metz (symptomatically) read Laura Mulvey's famous piece of 1975, "Visual Pleasure and Narrative Cinema."[18] In his undated notes on the essay he writes: "[...] the article speaks very little, barely at all, of the means to be used to destroy the old cinema. Could it be that the article is an alibi to study and love the latter?"

AvdO: And then there is the different attitude toward ideology?

ML: We've just briefly touched on it. The other key point indeed has to do with ideology. The social – which is the domain of study of history, political economy, sociology, anthropology, etc. – is for Metz the *source* of all symbolism, with the latter being the object of study of semiology and psychoanalysis (the one investigating what Freud called the secondary process and the other the primary process). Metz however refuses the vulgar Marxist temptation to look at the symbolic as a superstructure whose only task would be to reproduce the infrastructure from where it arises. In fact, the symbolic for Metz is neither wholly superstructural nor entirely infrastructural: he calls it, following Marxist philosopher Lucien Sève, a *juxtastructure*. That is to say, it is distinct from the social infrastructure and, yet unlike the superstructure, interacts with it at the same level, even *in part* adding itself to it. The example Metz takes from Sève being biology in relation to the social base. This, in fact, is an interesting example if one considers a manuscript I found in the Metz archive at BiFi. These are notes, entitled "Vision binoculaire et vision monoculaire (idéologie et données psycho-physiologiques)" written for his seminar of 1973-1974.[19] The manuscript considers in detail depth perception in mono- and binocular vision, describing the inverse square law of distance, the law of consistency of size and shape and other principles that ensure a good *gestalt*. However, the manuscript concludes by asking, "In what measure and in what way is perspective ideological"? The simple answer is that perspective *is* and *is not* ideological. The key here is to distinguish between the discovery (or invention) of perspective, its functioning and its use (for what ends or purpose?). First, Metz explains, perspective was a discovery (the discovery of certain mechanisms of vision) and an invention (the integration of these mechanisms to the production of a visual stimulus). This means that the code of perspective "contains within it a scientific knowledge," such as the knowledge of the inverse square law, as well as the knowledge that this law, which is active in natural perception, is unknown to its natural "users." Consequently, in the functioning of perspective not everything is a deception. First, the depth we feel (the "impression of depth") isn't simulated (not an illusion or a deception) but is really present: "because it results from the same mechanisms that produce it in

real vision." Indeed, Metz shows that there are several *monocular* factors (masking, movement, axial movements involving the law of inverse square) that play an important role in depth perception in binocular vision. These factors are monocular in that they are optically independent of the fact that both eyes perceive bidimensional images that are slightly different. Secondly, true binocular vision as we experience it with both our eyes is really absent – and really felt to be absent – from bidimensional perspectival representations. We don't mistake perspectival images for 3D stimulus, and though they reconstruct some of the mechanisms of real depth perception they don't pretend to do more than that. However, in the functioning of perspective there are also forms of ideological deception. For one thing, perspective imagery functions on the basis of "hiding" the very code it relies on. The functioning of the code gives the illusion of its absence due to the resemblance or impression of reality it fosters. This is a key Metzian idea: the code, when it "works," always suppresses itself as code. Also ideological is the (psychological) denial that accompanies perspective imagery: the viewer knows that true depth is absent, and yet the presence of an impression of depth due to the monocular factors mentioned above, drives him/her to do *as if* real depth were present. However maximum ideology resides in the *use* that is made of the perspective code, namely in the fact that it is most often used with "the sole end to represent stories (or visual spectacles, as in painting) by endowing them with an air of truth." It's this sort of subtle response to the problem of perspective that ultimately distinguishes Metz's approach from Baudry's notwithstanding all they do share. Furthermore, if I may, Metz was a true cinephile, even though he was fully aware of how the love of film risks short-circuiting theory (he discusses this in the opening pages of *The Imaginary Signifier*). I would go so far as to say that this cinephilia forms the repressed side of *The Imaginary Signifier*. It's "symptoms" are fairly obvious to one who knows his work well. Not so much I think for Baudry (at least in the two essays discussed here), which, paradoxically (perversely perhaps?), may well have been something Metz appreciated in Baudry's work.

AvdO: Interestingly, both Baudry and the love for cinema are mentioned in the opening pages of *The Imaginary Signifier*. It always seemed to me that his reflections on the cinema as an apparatus were triggered by both: Baudry's theorizing; and Metz's wish to determine how the "love for the cinema" affects theorizing. As to his love for cinema: when Metz discusses the different relations to the "equipment of the cinema" in the small chapter on the "The cinema as technique,"[20] he explains that "a partial component of cinematic pleasure is to be carried away by the film (or the fiction, if there is one)," another "to appreciate as such the machinery that is carrying [one] away."[21] The filmic pleasure of *connoisseurs* or *cinephiles* specifically "lodges in the gap between the two": the *appareil de base* (which is concealed or absent) and its effects (which are overwhelmingly

present).[22] This triggers and facilitates the interest for technique in cinephiles. It is not accidental that all sorts of professionals, such as directors and critics, do often "demonstrate a real 'fetishism of technique,'" as Metz argues, adding that he uses the word "fetishism" here in an ordinary sense.[23] A fetish always being material, there is an obvious concern amongst cinephiles with the "cinema in its *physical* state." Furthermore, of all the arts "the cinema is the one that involves the most extensive and complex equipment"; the language of the cinema is greatly dependent on the "hardware."[24] Regarding his concern with theorizing the apparatus of the cinema, it seems to me that Metz's primary objective – slightly different from Baudry's indeed – was to explain the powerful effects created by the cinema, more particularly the mechanisms and processes working in viewers when they go to the cinema, talk about the cinema, love the cinema...; moreover, to lay bare the ways in which these very powerful mechanisms might affect or were affecting the new scholarly enterprise they were all engaged in: introducing the study of film as an academic discipline in Paris's universities in those days. Most of those studying film were cinephiles to begin with. They simply "loved cinema," classical cinema. As opposed to academic scholars in the other arts, the problem was not how to understand film. *Film is difficult to explain because it is easy to understand* – a statement by Metz that always stuck. Studying film was a new and wholly different matter. The complex mechanisms which made film so easy and effective needed explaining, and perhaps those in classical films in the first place. Was one function of his apparatus theory not simply: to point out that the study of film would need to live up to the very specific demands of an art of which "the 'technical' dimension is more obtrusive [...] than elsewhere"?[25] For sure, I see in Metz no love for gadgets as was often apparent in the (then new) study of new media in the early 1990s.

Furthermore, would you argue that his background in phenomenology may in some ways have prepared him well for this new enterprise? I specifically think of Merleau-Ponty and the one observation which is always the focus of interest of phenomenological media theories: the transparency of the medium or the self-denial of the medium; the observation that "media display something without displaying themselves" (Wiesing).[26] The paradigmatic example of a medium being transparent is language: when successfully used, the meaning comes across and the signs are immediately forgotten. "The perfection of language lies in its capacity to pass unnoticed" (Merleau-Ponty).[27] Obviously, it is quite a challenge to try to explain the transparency of an art form which (certainly when compared to languages and literature) is so heavenly loaded with hardware as the cinema is; moreover, the film medium is subject to constant technological innovations which make themselves felt as part of the apparatus of the cinema, and do create medium awareness, if only momentarily. One way to explain the process of rendering the techniques transparent for Metz was in terms of codes which created (restored) the reality effects of film. As you just put forward as a

key Metzian idea: the code, once it "works," always conceals itself. As does the medium.

ML: Firstly, I think technology, *per se*, is not a key concern for Metz even though, materially, the cinematic signifier as he understands it is determined by it. We can come back to the idea of juxtastructure mentioned above. In discussing Merleau-Ponty's notion that cinema is a "phenomenological art," Metz writes the following:

> It can only be so because its objective determinations make it thus. The position of the Ego in cinema does not derive from a miraculous resemblance between cinema and the natural characteristics of all perception; on the contrary, it is anticipated and marked in advance by the institution (equipment, layout of film theatres, mental apparatus [*dispositif*] that interiorizes all of this), and also by the more general characteristics of the mental apparatus (*appareil*) (such as projection, the mirror structure, etc.). which, although less strictly dependent on a period of social history and a technology, by no means express the sovereignty of a "human vocation," but rather inversely, are themselves fashioned by certain particularities of man as an animal (as the only animal that is not an animal): his primitive *Hilflosigkeit*, his dependence for care (long lasting source of the imaginary, of object relations, of the great oral figures of feeding), the motor prematurity of the infant which condemns it to first recognize itself through the sense of sight (and therefore in a way exterior to itself) anticipating a muscular unity that it does not yet possess.
>
> In short, phenomenology may contribute to the knowledge of cinema (and it has done so) insofar as it happens to resemble it, and yet it is cinema *and* phenomenology, in their common illusion of *perceptual mastery* that need be brought to light by the real conditions of society and man.[28]

So part of the institution of cinema is dependent on technology (equipment, layout of film theaters) as a condition of society (in Marxist terms, the infrastructure), but next to it, juxtaposed to it, are psycho-physical determinations. It is the connection, the juxtastructure, between these two determinations that is of interest to Metz in studying the institution of cinema which he defines as the meeting of three "machines": the industrial machine which is "external" (industrial and business practices of filmmaking, film distribution and exhibition, but also film technology, equipment, etc.); the psychology of the spectator, which is an "internal" machine (it interiorizes aspects of the industry – the political economy of cinema – through a libidinal economy in a juxtaposed circuit of exchanges); and finally film criticism as a third machine further juxtaposed to the other two machines. In this scheme, it is true, Marxism and (semio-)psychoanalysis, political economy and libidinal economy are on the side of "science" and "knowledge," as

they independently – or semi-independently – shed light on the determining conditions of the cinema institution. In short, with regards to psychoanalysis, technology is only of interest to Metz in terms of its juxtastructural relation to the psycho-physiological determination of the cinema institution.

In the brief section of *The Imaginary Signifier* you mention, the analogy is between the structure of fetishism and the situation of cinephiles who "know" how much the cinema requires a heavy investment (in both senses of the term: financial/industrial and libidinal) in equipment or technique and yet nonetheless appreciate the (classical) film *as if* it were an immediate transcription of a world that gives itself over to contemplation. The point being that the more one knows about film (not just technique, but everything connected with the enunciative side of filmmaking writ large: contractual details of the production of a film, directorial intentions, etc., but also scholarly knowledge of film history, film aesthetics, and theory), the more one has to disavow this knowledge in order to achieve the kind of "fetishistic" pleasure classical fiction cinema is capable of procuring. Even here, however, the argument isn't a deterministic one: film technology doesn't *necessarily* lead to such psychic structuring as Metz is describing. Take the case of very early spectators. It seems they were interested in the projection equipment almost as much as they were in the images (or "world") it projected. The projector and its exhibition were part of the overall spectacle of motion pictures, along with the projected images even though, one could argue, the projector "faded" from sight (and mind – or at least from attention) as soon as the lights went out and the screen began to register the moving shadows (the projector could still be overheard, however). This said, the coming of encased projection booths in nickelodeons (in part for security reasons) implied that the projector, now conceptually "domesticated," was no longer part of the "show" and could be construed as evidence that it's presence might in fact disturb those attending the spectacle. Its disappearance, if you will, enacting (or helping enact) at an institutional level the sort of disavowal that characterizes the fetishistic structure Metz claims for the spectator and especially the cinephile, the spectator "in the know." For Metz, who is interested in classical cinema's ability to construct a world, interested in what he calls the *romanesque* (the novelistic), the pleasure the film affords is always shaded by some degree of disavowal and therefore by perversion.

In the manuscript I mentioned earlier which will be published in *1895* ("Existe-t-il une approche sémiologique de l'esthétique?," a conference paper from 1971), Metz compares the tasks of semiology and psychoanalysis in trying to answer the question of what sort of cinema, if any, semiology could endorse. He writes:

> Every film effectively engages primary processes (for example, condensation and displacement), but usually they remain ignored (by the filmmaker as

much as by the audience). And this is why (see Lyotard) they can accomplish desire (not *fulfil* it, but accomplish it hallucinatingly)

Now it is obvious that an expanded semiology would be led to pursue to some extent a film that would *take as its subject, as its goal* the analytical exhibition of the way condensation and displacement function. Yet, by the same token this film would be fatally deceptive and mobilize defenses. Desire would find in it its un-accomplishment (except where part of the libidinal economy has genuinely moved over to the side of a desire to unmask, a desire to know, that is to say, in the end, an *assumed voyeurism*, an attitude that would be at once perversion and its opposite. Instituting in each of us such an economy is no simple undertaking).[29]

That same year, 1971, Metz wrote an important essay on special effects ("Trucages et cinéma")[30] where he distinguished clearly between two forms of pleasure in the cinema: pleasure arising from the diegesis (in this case, invisible special effects) and pleasure arising from the "cinema-machine," a form of pleasure which is more closely tied with the film's enunciation (in this case, the pleasure concerns special affects that are recognized as such and therefore function as a feat to be celebrated in that regard). These remarks help explain why Metz came late to the problem of enunciation in the cinema: his pleasure lay on the side of the diegesis which he nonetheless relentlessly and ruthlessly assaulted in seeking to lay bare its mechanisms, its codes. This isn't to say that his work on enunciation is devoid of "cinephilia." Quite the opposite, in fact: it's the book where he cites the most films, almost at times a catalogue, and often offering loving descriptions where adjectives such as "magnifique" (*à propos* URGENCES [1988] by Raymond Depardon), "les belles images" (*à propos* LE TROU [1960] by Jacques Becker) abound. Perhaps the "displacement" of the site of pleasure, from diegesis to enunciation required this new form of writing. At the Zurich conference, Dana Polan showed very convincingly how *L'Énonciation impersonnelle* is a very "loving book" and I agree with him that it "goes against the argument that exposing the apparatus breaks down ideology"[31] as the people at *Screen* had inferred. Indeed, in his unpublished "review" of WHO FRAMED ROGER RABBIT (Zemeckis, 1988) Metz writes: "It is the triumph of the signifier, since the story doesn't matter anymore, and the only thing the cinema does here is to self-exhibit, but this triumph is not what post-'68 materialism would have believed. With the "signifier" it is the money-grubbers (*les marchands de soupe*) who triumph."[32]

Now, to come back to your question, perhaps it was the phenomenologist in him that expressed itself in that pleasure in the diegesis, the pleasure from seeing a world, the cinephilic pleasure – the very pleasure Bazin, among others, expressed in his reviews. However his "attacks" on the normal working of the code, his constant attempts to go beyond or behind perception show the dilemma he was in: his discourse was not to be confused with Bazin's. In the end, and

this is obvious in *The Imaginary Signifier*, phenomenology was essential and valued by Metz, but only as the (required) *negative* side (or dialectical *flip-side* if you prefer) of the semio-psychoanalytical enterprise.

AvdO: In retrospect, how do you assess Metz's work in the 1970s? Put differently, would you agree that apparatus theory contributed to the constitution of *cinema* studies as an object *sui generis*, defined by a number of concepts – the cinema apparatus, the *appareil de base*, the dispositif, etc. – that changed the study of film in that very period? Moreover, do you feel film and media scholars today may still gain interesting insights from Metz's reflections on the apparatus as developed in *The Imaginary Signifier* (taking into account that these essays were written in the heyday of psychoanalysis and that the latter lost much of its aura since)? Or would you rather argue that Metz's (and Baudry's) apparatus theory today is mainly interesting from a historical and epistemological perspective?

ML: In the end, the impact of 1970s apparatus theory was perhaps greater than could've been anticipated at the time, even though much of it is largely pooh-poohed today. For one thing, it gave new vigor to the study of spectatorship within the orbit of film and media studies. Whereas spectator studies had always been marginal forms of sociological and psychological interests in the discipline (from the Payne Fund studies all the way to the Filmology movement), apparatus theory was instrumental in initiating a move away from the film itself (or from cinematographic codes as manifested in films) as sole object of study. And while it was certainly guilty of the very idealism it sought to critique, offering a universalizing conception of *the* spectator, as it was soon pointed out, it nonetheless opened up an new area of study. Furthermore, by offering a target for historicized, local-specific, gendered as well as cognitive accounts of spectatorship – all of which criticized apparatus theory in part or *in toto* – one could say it was also dialectially/negatively valuable and important for our field. Thus, there can be no doubt that it had a profound impact on film and media studies. That's for the historical value of apparatus theory.

AvdO: Agreed, the historical value cannot be denied, but looking from an epistemological perspective, would the apparatus theory still be important to the field of film studies today?

ML: If one looks at the issue epistemologically, then I think one of the questions raised by apparatus theory concerns the good usage of analogy in theory. Let's go back to Baudry for a minute. There is no denying that the canonical ideal of Western film going – a situation we find today in cinémathèques more so than in any suburban multiplex – shares a number of features with Plato's myth of the cave. One question, then, is What are we to make of such (suggestive) likeness?

And more importantly, What are we to make of the differences – what are the "limits" of the analogy? In short, How are we to productively make use of analogies (keeping in mind that this is what they are)? Now to put it simply: Plato's cave is an allegory, film going isn't. What Baudry's analogy was inadvertently doing was turning film going into an allegory, hence the idealistic, universalizing traits that clung to it. What Baudry produced, then, was an *image*. But is this image, in itself, useful? And to what end? One problem with this image, as media archaeologists and historians have shown us through their work, is that it kept hidden important historical facts about various apparatuses, spectatorial situations, different *dispositives* which have played a role in the emergence of cinema. Images show us things, but they can also turn out to hide things away.

I think this is also where Metz is more interesting, in this regard, than Baudry. To be sure, Metz uses analogies – there's nothing intrinsically wrong with that, quite the opposite. But his analogies are properly *structural*. This is always how he worked. If you look at the wonderfully rich essay that ends *The Imaginary Signifier*, the long piece on metaphor and metonymy, you see that he's not really interested in these terms, "metaphor" and "metonymy," *per se*. What interests him is the *deep semantic and logical structure* they stand for, a structure which is independent of their surface manifestation in rhetoric or verbal language. A deep structure that seems to manifest itself also in dreams (according to psychoanalysis) and in films. This is why his isn't an attempt to "map" linguistics or classical rhetoric *onto* film. The point for him, moreover, is always to account for an *impression* film leaves on the viewer, in this case the impression that films mean more than what they show, than what is given to visual perception alone. The same holds true for the other essays of that book, including "The Imaginary Signifier" where a good deal of what is at stake concerns classical cinema's impression of reality and its involvement in the pleasure that films can provide – in good measure due to the machinery of cinema, whereby the world of fiction is doubly imaginary, doubly absent – and the forms of desire they rely on. Metz's work does not "criticize" the cinema (as Baudry does), he offers a *critique* of it (in an almost Kantian sense): studying the (psychic) conditions of possibility for the pleasure it affords and how they merge with or juxtapose technical conditions.

AvdO: Metz's interest in the "conditions of possibility" for providing "pleasure," as you say, was made possible by cinema's technical aspects, its apparatus. Yet in your reflections on Metz's theory, the technological seems to be outweighed by the psychoanalytical...?

ML: If it appears like I'm downplaying the technological, apparatus side of Metz's work in the 1970s, it's because I want to avoid mechanistic/deterministic readings of it which I don't think properly echo his project. The material aspects of the cinematic signifier reflect desire and pleasure as much as they dispense it.

And in as much as pleasure and desire are what is at stake in Metz's psychoanalytic account of the apparatus, I think there are still insights to be gained from it, even today. Indeed, if one avoids reifying it, avoids the implicit (and in, naïvely, an almost Hegelian sense) historical scheme posited by Baudry (from Plato, to Renaissance perspective all the way to cinema, as the only trajectory or lineage for projected moving images), there is no reason why Metz's overall perspective couldn't cross-pollinate with some of the more historical and media archaeological work being done today. Do the same desire and pleasure occur in watching a film on my iPhone or iPad? I think Metz would argue that they do, for the signifier is equally imaginary there as it is when a traditional movie screen and projector are used (I know for a fact that Metz watched a lot of films on television and on videotape!). Of course, the sort of pleasure Metz discusses may be harder to achieve or sustain when the iPhone starts ringing or when emails come in while I'm watching a film – does this mean that we're back to a situation akin, if only in this respect, to that of early film goers likely disturbed by sitting next to the projector? But then again with so many people nowadays using their smartphones in commercial film theaters, achieving and sustaining pleasure may be a difficult project there as well...

AvdO: Is the signifier indeed equally imaginary if the screen size and other elements of the *appareil de base* and the *dispositif* are radically changed? What happens when we remove the traditional movie screen, the projector and its light beam, the dark cinema auditorium? That certainly is a *Metzian* question. Of course such a question was not asked in the heyday of classical cinema. But we may indeed wonder. What about film viewers in a train on a bleak winter day bending over their phones to watch, say THE WIZARD OF OZ? It has struck me many times that viewers when bending over their phones would suddenly put this typical soft smile on their faces, as if seeing something innocent and cute. In art history this type of effect is addressed in relation to miniature art, miniature portrait painting, doll houses, etc. Would miniature artifacts – or IMAX screens, for that matter – exist if they would not affect viewers? Then: Do phones affect the imaginary status of the seen? Do they affect the imagination of viewers in a radically different way? One can argue that, in the end, they do not, that is, when viewers have become users who are used to watching like this, to phrase it tautologically. In other words: the film experience may end up being not all that different in terms of the imagination for viewers who shift screens habitually.

ML: It is obvious that the phenomenal conditions of film watching on, say, a miniature screen are different from those offered by mainstream large-screen film theaters. One could claim that there is a loss of impact in image and sound, for instance (however, one could equally ask whether there are *gains* "elsewhere" in the experience). The counterpoint, of course, is that individuals now have

home theaters built to recover part of that impact. It's difficult to say how Metz would have theorized these changes in the material and perceptual conditions of viewing films and it's unfair to him to speculate what his views would be. However, Metz was not insensitive to technological change in the cinema. In notes that he took on Rudolf Arnheim's *Film as Art*, Metz wrote: "Perhaps, as of 1980, the cinema in its entirety is dead at the benefit of TV and new media." Now Metz was very fond of Arnheim's work and he devoted an entire seminar to him. Further on in his notes, however, he critiques Arnheim for failing to consider cinema's technological evolution:

> The blind spot, the closing of the mind is that he [Arnheim] didn't understand this: that, because it is technological, the cinema is fatally subject to evolution. The latter can only lead to improving cinema's impression of reality, and also render the latter more automatic. It is true that this eliminates the coarse and childish "signifying effects" Arnheim loved (a gigantic shadow used symbolically doesn't fare well in a strongly "realistic" film), but it is also normal (and this Arnheim also rejected) that, when a young art develops signifying effects become *much more subtle*, and, by the same token, compatible with the complete reproduction of reality, such as the true or false alternating and repetition effects in Hitchcock that R. Bellour studied. Arnheim didn't want to see – simply for a biographical reason, that of a self-attachment to his own era – that inseparably linked to the technical progress he abhorred, the anonymous collectivity of filmmakers was becoming ever more clever, ceaselessly recomposing its margins of creativity.[33]

Notice, however, that the argument concerning technology here is an *aesthetic* one. If we come back to the problem of the apparatus, it's important to recognize that Metz's theory of the *dispositif* as *vehicule* of the cinematic signifier is dependent on a number of *principles* (especially the specific regime of absence/presence that the cinematic signifier ensures) that still hold when watching a film on a miniature screen. In short, in Metzian terms, and keeping in mind that the signifier is not the *machine*, the real question one should be asking here is the following: with the proliferation of screens and formats, has the nature of *the cinematic signifier* changed?

PART V

Envisioning the Future

The Future History of a Vanishing Medium

André Gaudreault

Notice

This article began as my contribution to a panel at the 2012 Society for Cinema and Media Studies (SCMS) conference in Boston entitled "The Disciplinary History and the Identity of an Academic Discipline: Historicizing Film History." In his invitation, the panel organizer had explicitly asked me to explore the ideas found in my most recent research into the "digital revolution" and the question of the "death of cinema." The task was to "conclude a panel with some thoughts about the future of film history" by attempting to gauge the possible impact on future film historiography by the promised disappearance of celluloid and the recent changes to the entertainment available in movie theaters, where it is now commonplace to consume work normally intended for the small screen, such as *filmed* operas, stage plays, and ballets.

I quickly realized that it would be quite risky, at an academic conference, to engage in reading the future and to appear, without a safety net, to be making predictions to which could be applied none of the rules for validation to which scholars are accustomed, even in the humanities. And so I opted for a relatively playful approach, that of letting people attending the panel imagine that it was not André Gaudreault speaking to them in the present but rather someone from a brand new generation (Paul-Emmanuel Odin, a young scholar who exists in real life and who I thank for allowing me to give him a fictitious role in my presentation) speaking to them from the future.

Now that the digital turn has shattered to pieces the very idea of cinema as a linear and monolithic medium, we may truly wonder about the future history of this almost boundless medium that is in the process of taking shape and which we still call "cinema." One thing is certain: cinema is in crisis; it is in the process of changing, of mutating even, here and now, in our presence, live, right before our eyes. But it's not just cinema, it's not just media, which is changing and mutating. *We too are also in the midst of a process of mutation.* We

as *film viewers*, but also as active members of the small community of *film studies scholars*. The boundaries of cinema-as-medium are not the only ones constantly shifting; there are also the boundaries of what we call film studies. And, by extension, the boundaries of that discipline within film studies we call film history. What will become of film history if "films" disappear and the movie theater is no longer devoted only to films? What will remain of film history after the "digital revolution"?

The intuition I had when I was asking myself this kind of question was that the *telos* of the new historians would have to rely on the proliferation and hybridity of cinema, its multiple territories, its fragmentation. I came to the conclusion that the paper I would deliver at Boston should tend to show how the historians of the near future would be obliged to pass from a kind of unified history (the history of *the* cinema) to a fully fragmented one (the history, say, of the "variants of cinema" that exist today ("cinema" films but also museum installations, television series, films for smartphones, etc.) – variants that have gained ground since the boundaries became so blurred between genres and media that our center of interest has shifted from a close-up on "classical narrative" cinema, as it is known, to that more overarching and encompassing reality known as "moving images."

In this light, I came up with an approach which threw my audience off guard a little, at the same time as I asked for their cooperation by putting them in a situation in which they would project themselves into the future with me (or rather with my avatar), not to a Society for Cinema and Media Studies (SCMS) conference in Boston in 2012, but to the annual conference of the same association thirty years later (in 2042), after it had once again changed its name (a pure supposition on my part, of course) to become the Society for Moving Image Studies (SMIS).

I ask the reader of the present text for the same sort of cooperation, which requires a kind of intellectual gymnastics which we are not used to encountering in a scholarly presentation. The reader will understand that, while the rules of the game usually require a text derived from a conference paper to erase most of the signs of its verbal origins, I have not followed this rule in the present case, for obvious reasons.

A.G.

Presentation of the Speaker

[Reminder: We are in 2042, four months after the fourth edition of the conference, "The Impact of Technological Innovations on the Historiography and Theory of Cinema"]

> We've just been informed that, thanks to the "*Back to the Future* Vision Device," patented recently by James Cameron, Jr., there has been a last-minute change to the program. We were supposed to hear a paper by André Gaudreault, but he will be ante-retro-replaced by Paul-Emmanuel Odin who, despite his ample years, is something of a junior himself, because he is the son of the father of semio-pragmatics, Roger Odin.
>
> Paul-Emmanuel Odin defended his dissertation (entitled "L'inversion temporelle du cinéma") some thirty-one years ago (in July 2011), at the Université de la Sorbonne Nouvelle. Let us now hear this specialist of retro-temporality, Paul-Emmanuel Odin, who will share with us a paper entitled "From *Cinema* to *Moving Image* and Then to *Post-cinematic Media*."[1]

I would like to begin by pointing out that my paper is a follow-up to one that I gave eleven years ago, in November 2031 [remember: we are supposedly in 2042...], at the third edition of the conference "The Impact of Technological Innovations on the Historiography and Theory of Cinema,"[2] which was held simultaneously in Montreal, Paris, Hollywood, and Mumbai using holo-digital telepresence technology. The title of that paper was "What Remains of [So-Called] Cinema Since the Advent of *Post-Cinematic Media*: A Semio-Pragmatic Approach."

I remind you that at the time we had by then all adopted the expression "moving images" in place of the word "cinema," which had become completely obsolete around the year 2020, and that the "Impact" conference of 2031 was the first time that "post-cinematic media" were conceptualized, having before that date been in their infancy.

I remind you also that the word "cinema," derived from the camera invented by the Lumière brothers, which they had called the "Cinématographe," became current in the 20th century to describe the new art form, often at the expense of that all-American expression "motion pictures." Here is an exemplary case of the word "cinema" being rejected by two major figures in the history of moving images, Orson Welles and Peter Bogdanovich:[3]

> **Peter Bogdanovich**
> Was it true that one director told you not to call them "movies," but "motion pictures"?
>
> **Orson Welles**
> Ah, that was a friend of yours, Peter – that was George Cukor, and remember, he was from the New York stage. That probably had something to do with it. Nowadays, I'm afraid the word is rather chic. It's a good English word, though – "movie." How pompous it is to call them "motion pictures." I don't mind "films," though, do you?

Peter Bogdanovich
No, but I don't like "cinema."[4]

This brief dialogue is a compact overview of some of the names used in the 20th century to describe moving images: "movies," "motion pictures," and "cinema." Between "cinema" and "motion pictures" the industry was always partial to "motion pictures," while scholars often preferred "cinema." Think of the current name of "Academy of Moving Image Arts and Sciences" which, you will recall, was known until 2020 as the "Academy of Motion Picture Arts and Sciences," a name that lasted almost a century after being adopted by the industry in the 1920s.

What the Academy did in 2020 was to give precedence to the concept "moving" over that of "motion," whereas the expression "motion picture" was proposed 107 years earlier precisely because the concept "moving" was rejected. William Paul explained this in an article published in 1997,[5] at a time when journals were still printed on paper:

> In the fall of 1913 *The Moving Pictures News*, a prominent exhibition trade journal that had been recently purchased by its competitor *Exhibitors' Times*, promised among other innovations that it would soon "announce the new name of the merged publications." A couple of weeks later the new name appeared: *The Motion Picture News*![6]

One of the reasons Paul gave for the preference for *motion* over *moving* was the latter's relatively vulgar and popular aspect, and the fact that *motion*...

> [...] help[s] signal the "highest aspiration of *The Motion Picture News* [...] to represent the art and industry of the motion picture in a dignified, honorable and progressive spirit." [...] The change was also possibly a marketing strategy to distinguish itself from its chief competitor, *The Moving Picture World*.[7]

By means of an ironic swing of history's pendulum, we went, then, from *moving* to *motion* in the 1910s and from *motion* to *moving* in the 2010s.

You will recall that it was during the digital revolution in the early part of this 21st century that the expression "moving images" began the discreet invasion that led it to completely dominate what was still known at the time as the field of film studies, or cinema studies. To such an extent that in 2017 the organization hosting this week's conference decided to face the music and, once again, change its name. At the time of the digital revolution, our association was indeed known as the Society for Cinema and Media Studies (SCMS), after having been named in 1969 the Society for Cinema Studies (SCS).

Here is what the Web 4.0 site of our association has to say about this:

> The late 1990s saw the debut of digital media as a growing field of study. During the last decade the number of Scholarly Interest Groups (SIGs) has expanded, reflecting the growth of sub-fields in Cinema and Media Studies, many intermedial and interdisciplinary. In 2002 the "M" for Media was added to SCS to reflect these changes and create the Society for Cinema and Media Studies.[8]

Thus what lay at the source of the change of name in 2002 was the "digital turn" that threw things and people into confusion about the identity of the medium. Nevertheless, 1969 was not the year of the association's Big Bang. Its first version was founded ten years earlier, in 1959, by a gang of visionaries:

> In 1959 the Society of Cinematologists was founded with an initial council consisting of Robert Gessner (New York University), president; Hugh Gray (UCLA), secretary; and Gerald Noxon (Boston University), treasurer.[...] The journal of the organization, which had been started in 1961 as The Journal of the Society of Cinematologists, became Cinema Journal in 1966.[9]

The web site informs us of the French origins of the word "cinematologist," one worthy of the fabulous sixties:

> The first name of the Society was always controversial. The term "Cinematologist" was adapted by founding president Robert Gessner from the French "filmologie," a term coined by Gilbert Cohen-Séat in 1948 [...][10]

What those who took over the Society in 1969 did was make the word "cinematologist" vanish and replace it with "cinema," the same word that fell under the wrecking ball in the 2020s, to be replaced systematically by "moving images" in a manner that the two months of intensive research I have just completed has enabled me to trace.

While it did not succeed in dominating the field for all time, the expression "moving images" that we adopted with such unanimity some twenty years ago was not, of course, unknown in the 20th century.[11] Here, for example, is a brief remark by none other than the very first president of our association, Robert Gessner himself, in an article published in *The Journal of the Society of Cinematologists*, the ancestor of our beloved *Moving Image Journal*, which took over from the journal known as *Cinema Journal* at the time of the SCS and SCMS. Here is what Gessner wrote in 1962:

> For an aesthetic-historical importance, however, LIFE OF AN AMERICAN FIREMAN is entitled to be considered the single most important improver in the history of the Moving Image.[12]

It's astonishing, isn't it, to find here, word for word, the title of courses found today in many of our universities since at least the 2030s: "The History of the Moving Image!" They were visionaries back then, I tell you...

Let's move on to my hypotheses as to why the term "cinema" was rejected in the 2010s in favor of the expression "moving image." We all know it was the fault of the digital revolution, which began in the final years of the 20th century and had an enormous impact on all media, and especially cinema. At least that is what my research has enabled me to ascertain. So much so that that the ensuing paradigm shift pushed "film studies" and "cinema studies" aside in favor of "moving image studies."

The first thing to note is that the digital revolution upset the kinematography apple cart more than is generally acknowledged. This revolution was not just the convergence of media and the multiplication of platforms; it was also a shift in perception that shook the pillars of the temple to such an extent that the social users of media went through an almost chronic period of instability more intense than anything the world of moving images had seen before. The arrival of sound and the advent of television were tempests in a teapot compared to the tsunami of the digital revolution.

Beginning around the year 2000, the media universe began a period of unprecedented turbulence. The classical media lost almost all their bearings, setting each one in search of its identity.

You may have noticed that I am using the word "media" in the plural. I should point out, for younger readers that it was still customary as late as the early 2020s to distinguish media from each other, something more or less inaugurated by the patriarch of what was still known as "media studies," Marshall McLuhan, with his groundbreaking study whose title, *Understanding Media*,[13] used the plural form of the Latin word "medium." This was before total convergence took hold with the release of "Grand Digital HypeMedia" in the year 2025, which changed everything.

The first decade of the 21st century, let me remind you, was a time when the definition of cinema was as uncertain, shifting, elusive, imprecise, unstable, variable, etc., etc., as could be. One of the questions that scholars were constantly asking, believe it or not, was the then already age-old question posed by André Bazin some time earlier, "What is cinema?" This also took various other forms: "When is it cinema?," "Where is cinema headed?," "Is it cinema?," etc., a fact corroborated by the titles of film books being published during this period. Here is a selection of volumes which all share this anxiety over the future of cinema:

Cherchi Usai: *The Death of Cinema*[14]
Cinergon film journal: "Où va le cinéma?"[15]
Rodowick: *The Virtual Life of Film*[16]
Dubois et al.: *Yes, It's Cinema*[17]
Tryon: *Reinventing Cinema*[18]

Fig. 1: Cover page of issue no. 226 of the magazine Paris Match, *dated July 18 to 25, 1953.*[1] *© Paris Match/Scoop.*

Make special note of the more recent one, by Dudley Andrew, who inverts the terms of Bazin's question to proclaim loud and clear: *What Cinema Is!*[19]

On the ground, two camps faced off: some people in the media camp announced the imminent death of cinema, while the others proclaimed on the contrary that cinema was shining brighter than ever and that its future was assured. Those in the former camp are the victims of what Philippe Marion and André Gaudreault called the DEAD CINEMA syndrome.[20]

Many others at the time saw cinema, on the contrary, as expanding and extending widely. So much so that there was a shift from Gene Youngblood's *Expanded Cinema*[21] to the *Extended Cinema* of Philippe Dubois and company.[22] These two seemingly contradictory syndromes co-existed and waged a titanic battle for people's hearts:

> What is remarkable in this title, is not the term "extended"; it is to continue calling new forms like installations, performances with projections, closed-circuit television, the computer processing of images, holography, and all which has happened to the image since the arrival of the computer and the telephone. [...] Cinema is not in the process of declining, of disappearing, or sinking into oblivion, but rather, in the infinite variety of its forms and practices, it is more alive than ever, more multiple, more intense, more omnipresent than it ever has been. [23]

As for the opposite idea of the death of cinema, that is nothing new. It was even a recurring theme throughout the 20th century. In July 1953, the magazine *Paris Match* asked the question "Will cinema disappear?"[24] (Fig. 1). It fingered those responsible: Hollywood's dramatic crisis and the desperate battle between new techniques and television.

The crisis cinema was going through at the turn of the century is not the first it has known. The history of the seventh art has been punctuated fairly regularly by intense moments when the medium has been radically called into question. Before the crisis brought on by the appearance of television, there was the one caused by the transition from silent to sound film. In each case, a few doom and gloom types took the opportunity to announce the death of cinema. And yet cinema did not die: not in 1930, nor in 1950, nor in 2010, even if at the time newspapers sometimes carried apocalyptic stories, as in the particularly over-the-top example shown in Fig. 2.

It's true that between 2010 and 2012 there was reason enough to worry. Those in the "cinema" camp sometimes seemed like chickens with their heads cut off, running around in every direction on the planet "cinema." Cinema, a word increasingly garnished with scare quotes!

Here, in no particular order, are some of the symptoms of the 2010s blues:

- University programs which no longer dared to openly call themselves "cinema" studies programs. It's always "Cinema and this," "Cinema and that," "Cinema and I don't know what all else!" For example, Concordia University, Montreal: "Film and Moving Image Studies"; Université du Québec à Montréal: "Cinéma et images en mouvement"; York University, Toronto, "Cinema and Media"; University of California at Santa Cruz: "Film and Digital Media."
- In other instances, the word "cinema" starts to take a back seat; it becomes a mere adjective. University of Southern California: "Cinematic Arts"; Oakland Community College: "Cinematic Arts Program."
- In some cases, things split open!!! The word "cinema" is abandoned and out and out replaced by "Moving Images." It's the beginning of the end. Georgia State University: "Moving Image Studies."

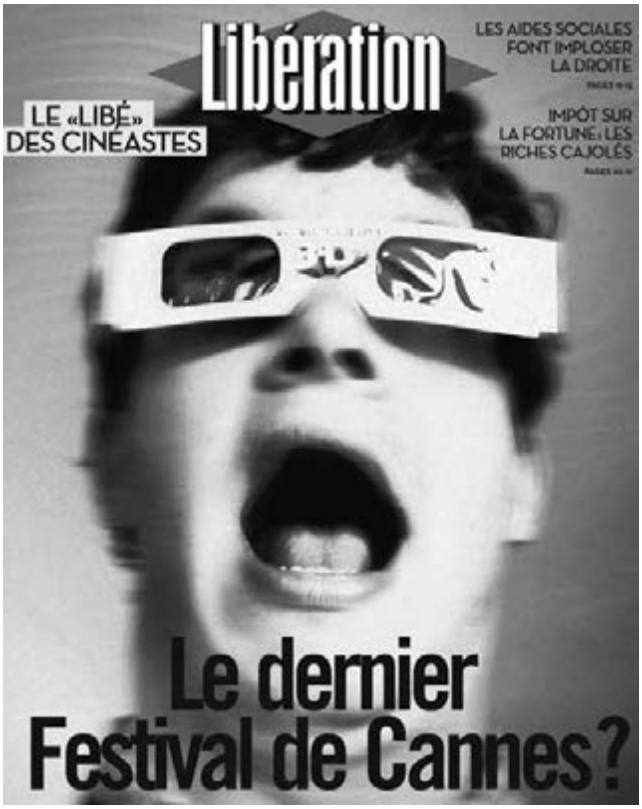

Fig. 2: Cover page of the French daily newspaper Libération*, May 12, 2011.*
© Libération. Photo credit: Benjamin Rondel/Corbis.

- There are also lots of examples of this identity crisis outside of academia. In late 2010 in France, the *Centre national de la cinématographie* got a makeover by changing its name to the Centre national du cinéma et de l'image animée…
- On the other side of the pond, there was also the case of the Cinémathèque québécoise, hitherto known for its exclusive love of cinema. It surreptitiously changed its vocation from that of a "Cinema Museum" to the less specific and less glamorous "Museum of the Moving Image."[25]

To give an idea of the disorientation that reigned in the first decade of the present century, I have chosen a case study, which was documented, in 2010 precisely, by a scholar who had participated, decades before, in the famous Brighton conference, André Gaudreault.

In fact the case documented by Gaudreault concerns the Cinémathèque québécoise, whose management staff, questioned by him, revealed the extent to which they felt confined on planet "cinema" at the time, and how they felt completely

lost and disoriented. Here as evidence is a statement by one of the curators of the institution:

> Over the years we have often discussed various names to describe the Cinémathèque [...] soliciting the opinion of members of the board of directors, the director, the communications department, or of external consultants. To such an extent that I have lost my bearings. [...] Already back in the 1990s we tried the expression "Museum of the Moving Image," then we went back to "Museum of Cinema" and now we have gone back to "Museum of the Moving Image."[26]

And this statement by the executive director:

> I heard [this suggestion] this week: "Museum of Cinematographic Diversities." A little "politically correct," no? For my part, I sometimes talk of film variants, but I would never say "Museum of Film Variants"![27]

We can see how urgent it had become to settle things in people's minds. We also see the lay of the land – mined land – on which "moving image" was soon to take hold in people's minds.

Before concluding, I would like to share with you a final hypothesis. I believe I have found one of the turning points (perhaps *the* turning point...) which, historically, pushed "film studies" to become "moving image studies." I refer to an international conference organized in May 2010 by the ARTHEMIS research group (the "Advanced Research Team on History and Epistemology of *Moving Image* Study"[28]) of Concordia University in Montreal. Headed by Martin Lefebvre, ARTHEMIS is a research infrastructure which, as it defines itself, is "dedicated to the study of the evolution of *film studies* as a discipline," and which exists since 2007.[29] In June 2010, ARTHEMIS organized a major conference (in which the cream of film studies participated[30]) under the title "The ARTHEMIS International Conference – Moving Images Studies: History(ies), Method(s), Discipline (s)."[31] We might say that the die had now been cast: not only did the conference make no mention of "film studies"; it was more concerned with the history, methods, and discipline of "moving image studies."[32] The ARTHEMIS group has thus surreptitiously passed from the study of a phenomenon ("moving image studies") to something that begins to have every appearance of a discipline: "moving image studies."

We can see once again, in a highly emblematic way, the concern that gave rise to the present text: that a group which declares itself to be devoted above all to the study of the evolution of "film studies" has made its focus (according to the title of its conference) not, precisely, "film studies," but what some people might see as a competitor: "moving image studies."[33] With hindsight, at a distance of

32 years, we might think of this as the date when the discipline whose name our association now promotes was born.[34]

I will now conclude in the form of a wish. I believe it is time, today in 2042, to change the name of our association once again, and I hope great numbers of you will support the proposition I have formulated which will be voted on at the General Assembly tomorrow to the effect that the Society for Moving Image Studies (SMIS) henceforth be called the Society for Post-Cinematic Media Studies (SPMS) in order to reflect the compromise that has been worked out over the past ten years between those in favor of a return to the term "cinema" and the members of our association who are firmly opposed, seeing in the term no more than a cheesy Romanticism. At the same time, this name change would confirm the validity of our association's decision, in 2002, to open our community to the media reality and intermedial reality of moving images...

THE END[35]

Translated by Timothy Barnard

Experimental Media Archaeology: A Plea for New Directions

Andreas Fickers and Annie van den Oever

Preamble

The history of media archaeology has been a history of discourse-oriented analysis. Friedrich Kittler, the intellectual father of media archaeology, inspired a focus on the materiality of the medium from the early 1980s onwards to lay bare the epistemological structures underpinning studies in the humanities.[1] While this tradition has produced interesting studies focusing on the discursive construction and symbolic meaning of different media technologies, the materiality of media technologies and the practices of use need more attention.[2] Media are widely acknowledged as utterly important in the formation of knowledge, cultures, and media-saturated everyday life, and urgently in need of further study. While media archaeology positively helped to constitute the field of media studies, and contributed considerably to the broader awareness of how important media are and have been in the past, we feel though that a further step is needed now in terms of studying the materiality of the medium to live up to the expectations raised. Instead of investing our energies in discursive enterprises, we opt for an investment in experimental media archaeology. Experimental media archaeology is inspired by the idea of historical re-enactment, acknowledging the historian's (the experimenter's) role as co-constructor of the epistemic object. Experimental media archaeology is driven by a desire to produce experimental knowledge regarding past media usages, developments, and practices. To do so, it will be practical as well as philosophical, empirical as well as theoretical, conceptual as well as experimental, drawing from psychology as well as sociology, ethnography as well as cultural anthropology, image theory as well as history. Lastly, experimental media archaeology has an archival drive; it aspires to use the immense collections of media apparatuses (*l'appareil de base*)[3] waiting in film and other archives for further research.

Re-Enactment as Heuristic Methodology

Experimental media archaeology is inspired by the idea of historical re-enactment as a heuristic methodology. As such, it is well established in the field of experimental archaeology[4] and in the history of science.[5] The idea of re-enactment as a heuristic concept of historical understanding has been introduced by the historian and philosopher of history R.G. Collingwood in his seminal study "The Idea of History":

> Historical knowledge is the knowledge of what mind has done in the past, and at the same time it is the re-doing of this, the perpetuation of past acts in the present. Its object is therefore not a mere object, something outside the mind which knows it; it is an activity of thought, which can be known only in so far as the knowing mind re-enacts it and knows itself as doing so. To the historian, the activities whose history he is studying are not spectacles to be watched, but experiences to be lived through in his own mind; they are objective, or known to him, only because they are also subjective, or activities of his own.[6]

Acknowledging the informative role of re-enactments in the historian's mind in the construction of her historical imagination, we propose to expand Collingwood's idea of "experiencing history" in doing historical re-enactments in practice not only as "*Gedankenexperimente*."[7] In engaging with the historical artifacts, we aim at stimulating our sensorial appropriation of the past and thereby critically reflecting the (hidden or non-verbalized) tacit knowledge that informs our engagement with media technologies. In doing experimental media archaeology, we want to plead for a hands-on, ears-on, or an integral sensual approach toward media technologies. As the French philosopher Michel Serres argued in *The Five Senses*, we need a "second tongue" in order to grasp the complex meaning of things. Using the example of wine-tasting, Serres shows that our analytical approach toward things – even to such a highly sensitive thing as "wine" – is dominated by our "first tongue": the tongue of language, speech, and words. This first tongue constantly rules out the analytical skills of our "second tongue," the tongue that tastes, that explores, that keeps silent. "Sapidity slumbers beneath the narcosis of speech," Serres writes.[8] This linguistic anaesthesia dispossesses people of their aesthetic sensation. In order to revitalize this aesthetic quality of things, we need our second tongue, that is: all our senses.

Anaesthetics is a word that should be taken seriously in the world of media studies, for at least two reasons. One, a pivotal feature of media usage is that the initial aesthetic effects wear off in the process of use up to a point where the awareness of the materiality of the medium may disappear almost fully. Two, the acquired experience of "transparency" affects media studies in profound ways,

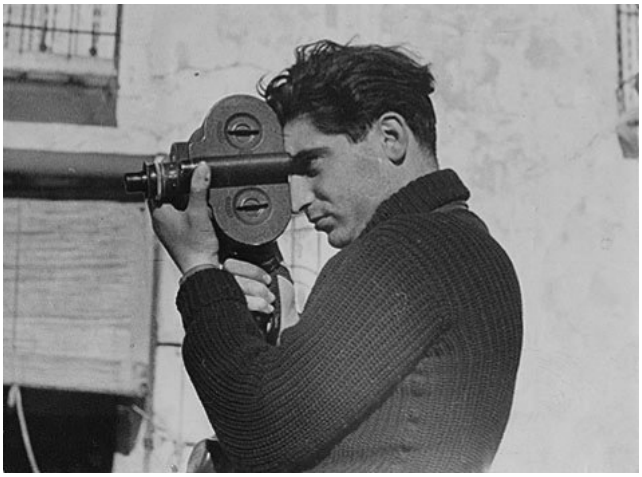

Fig. 1: Robert Capa with a 16mm Bell & Howell Filmo camera. The photo was made by Gerda Taro during the Spanish Civil War, May 1937.

including the ways in which the object of study is defined. The re-sensitization of expert observers is needed to construct the epistemic object; to define what a "medium" is; and to create consensus in the field with regard to it. It has already been noted in a series of studies that the definition of "media" has become so broad that it is now in danger of losing all meaning altogether.[9] Providing a workable definition of its object is nevertheless crucial to any field of studies and perhaps even more so for the field of media studies as it aims at understanding cultural practices which constantly and rapidly change, and media products of which the impact tends to be ephemeral, first sensed and then forgotten, on and off, in an ongoing process of use that automatically and inevitably conceals the traces media technologies initially create in users in terms of sense responses and awareness. In fact, the study of medium-awareness cycles should help to explain why the construction of the epistemic object and an operational definition has been such a challenge to the field.

Re-Sensitizing the Observer

We believe that doing historical re-enactments with old media artifacts is a heuristic approach that will offer new sensorial experiences and reflexive insights into the complex meanings and functionalities of past media technologies and practices. It aims at going beyond the "aesthetics" and "hermeneutics of astonishment" of media archaeology[10] by turning "observers" into "experimenters." In creating such a space for creative exploration and tinkering with either original artifacts or replicas, the researcher will get a first-hand experience of the heuris-

tic difference between studying textual and visual representations of past media technologies and experiencing their performative qualities and limitations in real-life interaction and re-use. In engaging with the material artifacts in a laboratory environment, experimental media archaeologists actively co-construct their epistemic object.[11]

As we have learned from so-called "laboratory studies" in the sociology and anthropology of science, scientific "facts" or "findings" are always the specific result of a combination of concrete temporal, spatial and social factors and radically historical (that means: open to change).

The heuristic value of doing historical re-enactments lies therefore not in the (impossible) reconstruction of an "authentic" historical experience, but in creating a sensorial *and* intellectual experiment that will demonstrate the differences between textual, visual, and performative approaches to the past.[12] In other words, it is not so much the "correctness" of these re-enactments that is at stake, but their productivity; generally speaking, their usefulness in research is what really matters, as Jonathan Crary has passionately pointed out.[13] The hands-on approach, we believe, might help to solve the "observer's dilemma" of classical media archaeology and hopefully create new forms of collaborations between archives, museums, media artists, and media scholars.[14] Moreover, it may help to close the epistemological gap in the research of media that has been left by the explanatory models assuming the transparency of media as explained above.

De-Auratizing Artifacts

One can actually observe a kind of melancholic retrospection of our analog past. This melancholic retrospection might on the one hand be the result of a generation gap or tension between the "analog born" and "digital born." On the other hand, it might be the product of a tension between the loss or stealthy disappearance of the material evidence of analog technologies in our daily lives and the massive resurrection of "analog-born products" in digital technologies and the Internet. While the generation gap between analog and digital is basically a demographic and therefore a temporarily delimited problem, the stealthy disappearance of material evidence of analog technologies constitutes a specific challenge for cultural heritage institutions such as museums and film and media archives.[15] As media scholars we should make sure that the material traces of these artifacts will not disappear from the digital radar of media scholars.[16] While we are enthusiastic about the possibilities of new digital research infrastructures, we are familiar with the "analog born" *and* historically minded enough to be aware of the danger of sacrificing the material cultural heritage of "old" media and memory technologies.

As media historians, media archaeologists, or media scholars in general we need the material traces of analog and digital memory technologies not only as

physical "witnesses" or "proof" of a period gone by, but as objects that can enlighten and educate our own analytical skills when it comes to the study of past usages of media technologies. A pure focus on "mediated memories" (or media texts) bears the danger of a reductionist perspective on media technologies, reducing the historical evidence of things to their textual tradition. Of course we are aware of the fact that the display of physical objects in a museum does not offer a "direct" or "unmediated" access to things. The objects in museums are staged artifacts. The visual gaze offered to a visitor of a museum is often that of a highly aestheticized view, and "things" or "objects" are staged as "master pieces" – even in museums of science and technology.[17] Yet the "aura of the original," which museums and archives try to stage, is of course a faked one.[18] The "aura" – at least in the sense of Walter Benjamin – is destroyed from the very moment an object is detached from its original environment. And it is exactly because of this inevitable "loss" of aura that museums try to create a new narrative framework, aimed at staging a mediated experience of the "aura." This re-auratization of objects in (white cube) museums is in fact a process of black-boxing, turning things into "objects of desire."[19]

Experimental media archaeology aims at opening the black boxes and turning museums and archives into laboratories for experimental research. In order to do so, the apparatuses ("artifacts")[20] have to be taken out of the aestheticized and glass-cased exhibition environments of museums and archives and transferred into the exploratory space of a media-archaeology laboratory. Such a lab creates a research environment needed to substantiate the claims of media studies regarding the impact of media technologies on audiences empirically and experimentally. It helps to close the gap between media research in the humanities and the sciences.

A New Research Agenda

This plea for an experimental approach to media archaeology aims at offering new perspectives to a better historical understanding of past media practices by pleading for "re-enactment" as a new methodological approach in media research. Doing re-enactments with old media technologies in an experimental media-archaeology lab will produce new historical, ethnographic, and empirical knowledge about past user practices and media experiences. It will advance our classical repertoire of sources generally used to study past user generations by the co-production of experimental data and ethnographic observations. Experimental media archaeology goes beyond:

- The discursive re-construction of the "configured user" (as staged in advertisements)

- The literary study of the "expert users" (as found in technical and consumer association journals and professional publications)
- The analysis of "amateur users" (as staged in "how to" manuals, popular journals, amateur club publications)
- The co-construction of "remembered usages" (as in oral history sources or performed in ego-documents)

Historical re-enactment (experimenting with old media technologies)[21] will:

- Provide new insights in the sense of time and temporality inscribed in the materiality of media technologies (e.g., the limited amount of recording time in home movie technology or the extensive exposure time of early photography)
- Enhance awareness of the spatial and topographical information inscribed in media practices (both of production and consumption)
- Enable a better understanding of the "constructivist nature" of media technology products (photographs, films, audio recordings, etc.) as historical sources (e.g., handling them as "staged performances" rather than "snapshot versions of life," that is, questioning the "visual" or "sonic" evidence of audiovisual sources)
- Make scholars of past media technologies "experience" rather than intellectually appropriate the acts of making and screening film as social and cultural practices

In offering these new insights and experiences, experimental media archaeology will inform us about the "tacit knowledge" involved in the use of media technologies and will thereby sensitize us to the role of our senses and our body in the human/machine interaction. This sensorial awareness will re-sensitize the media scholar to the social and cultural inscriptions in the materiality of media technologies beyond the discursive level.[22] Playing and tinkering with the material objects in a research lab will de-auratize the artifacts and help to decode the critical role of design as "mediating interface" between technology and the users.[23] In reconstructing and re-enacting idealized "how to" user scenarios, the experimental media archaeologists will be able to analyze and experience the differences between the social dynamics of media usages ("ensemble play"), and performing practices ("collective viewing"/"hearing"/"commentating") and their idealized discursive narratives and commercial staging. In promoting a hands-on philosophy concerning the collections of film and media archives and museums, experimental media archaeology aims at turning artifacts into research objects and to re-establish the experimental tradition of museums. In short, it aims at turning archives and museums into research laboratories rather than mausoleums of past masterpieces.[24]

In doing so, we would like to initiate a dialogue between the academic community of film and media scholars with engineers, curators, archivists, and the millions of media amateurs, collectors, and other technical experts who – in a steady growing number – wish to share their expertise and knowledge in online platforms and home pages. While this incredible source of information is rarely used and even less appreciated by professional scholars, we envision an interactive and participatory online database which gathers all kind of "information" regarding the development, use, invention, imagination, design, rejection, intellectual appropriation, and resistance of media devices of all times and places.

Media Scholars and Amateurs of All Countries and Disciplines, Hands-on!

Notes

Introduction: Researching Cinema and Media Technologies

1. N.N., "Het succes van de Kinematograaf," *Suriname: koloniaal nieuws- en advertentieblad*, Februari 25, 1898, http://kranten.kb.nl/view/article/id/ddd%3A010340255%3Ampeg21%3Ap003%3Aa0017.
2. As the journalist broadly refers to an anthology of terms published in the (German) journal *Laterna Magica*, it seems most likely that the list of terms cited is taken from this issue: *Laterna Magica* 21, no. 50 (April 1897): 25.
3. Lev Tolstoy's diary entry of April 26, 1895, quoted in: A.N. (Angus) Wilson, *Tolstoy* [1988] (London: Atlantic Books, 2012), 430-431.
4. See "Philosophy of Technology," *Stanford Encyclopedia of Philosophy*, last modified June 22, 2009, http://plato.stanford.edu/entries/technology/.
5. On "cinema" as a young practice and a young institute, see André Gaudreault, "From 'Primitive Cinema' to 'Kine-Attractography,'" in *The Cinema of Attractions Reloaded*, ed. Wanda Strauven (Amsterdam: Amsterdam University Press, 2006), 99.
6. For a further reflection on the etymology of the word, see the chapter on Heidegger in this book; see also the *Stanford Encyclopedia of Philosophy* online: http://plato.stanford.edu/entries/technology/; and "Heidegger's Aesthetics," last modified May 10, 2011, http://plato.stanford.edu/entries/heidegger-aesthetics.

The Philosophy of Technology in the Frame of Film Theory: Walter Benjamin's Contribution

1. Hans Ulrich Gumbrecht and Michael Marrinan, eds, *Mapping Benjamin: The Work of Art in the Digital Age* (Stanford: Stanford California Press, 2003), 19-55. See also: *Walter Benjamin on Art*, ed. Andrew Benjamin (Trowbridge, Wiltshire: Cromwell Press, 2005); W.J. Thomas Mitchell, "The Work of Art in the Age of Biocybernetic Reproduction," *Modernism/Modernity* 10, no. 3 (September 2003).
2. Dominique Chateau, *L'Héritage de l'art* (Paris: L'Harmattan, Ouverture philosophique, 1998), 301-330.
3. Walter Benjamin, *The Work of Art in the Age of Its Technological Reproducibility, and Other Writings on Media*, ed. Michael W. Jennings, Brigid Doherty and Thomas Y. Levin (Cambridge, MA: The Belknap Press of Harvard University Press, 2008), 19-55. Another version of this essay can also be found in Walter Benjamin, "The Work of Art in the Age of Its Technical Reproducibility: Third Version," in *Selected Writings*,

Volume 4: 1938-1940, ed. Howard Eiland and Michael W. Jennings (Cambridge, MA: Harvard University Press, 2003), 251-283.

4. Available on a UCLA website: http://www.marxists.org/reference/subject/philosophy/works/ge/benjamin.htm.
5. Jean-Claude Monoyer, ed., *Écrits français* (Paris: Gallimard, Folio essais, 1991), 147-248; Walter Benjamin, *L'Homme, le Langage et la Culture*, trans. Maurice de Gandillac (Paris: Denoël/Gonthier, Médiations, 1971), 136-181.
6. Benjamin, *The Work of Art...*, 20.
7. *Ibid.*, 42.
8. *Ibid.*, 19.
9. Max Horkheimer and Theodor W. Adorno, "The Culture Industry: Enlightenment as Mass Deception" [1944], in *Media and Culture Studies: Keyworks*, eds, Meenakshi Gigi Durham and Douglas M. Kellner (Malden, Oxford, Victoria: Blaxwell Publishing, 2006), 66.
10. Karl Marx and Frederick Engels, *The German Ideology*, ed. and trans. C.J. Arthur (New York: International Publishers, 1970), 109.
11. Cf. Karl Marx, *A Contribution to the Critique of Political Economy*, trans. S.W. Ryazanskaya (London: Lawrence and Wishart, 1971).
12. "La conquête de l'ubiquité," published for the first time in *De la musique avant toute chose*, texts of Paul Valéry, Henri Massis, Camille Bellaigue, etc. (Paris: Editions du Tambourinaire), 1928.
13. In Paul Valéry, *Aesthetics*, trans. Ralph Manheim, introduction by Herbert Read (London: Routledge and Kegan Paul, 1964), 226.
14. This epigraph does not appear in the version published by The Belknap Press of Harvard University Press, but it can be found on the UCLA website. The italics are mine.
15. Paul Valéry, *Selected Writings*, trans. Malcolm Cowley (New York: New Directions, 1964), 111.
16. Charles S. Peirce, "A Guess at the Riddle" [1890], in *Collected Papers*, ed. Ch. Hartshorne and P. Weiss, vol. 5 (Cambridge, MA: The Belknap Press of Harvard University Press, 1958), 45.
17. Benjamin, *The Work of Art...*, 39.
18. Jean-Louis Leutrat, *L'Homme qui tua Liberty Valance, Étude critique* (Paris: Nathan, Synopsis, 1995), 96.
19. Benjamin, *The Work of Art...*, 53.
20. Paul Valéry, "Discours sur l'esthétique," in *Œuvres*, ed. Jean Hytier, vol. 1 (Paris: Gallimard, Bibliothèque de la Pléiade, 1957), 1311.
21. The word probably comes from the medical vocabulary (and notably that of neurobiology), where esthesia (or aesthesia) refers to any sensation perceived by our sense organs, and the latter's capacity of sensibility.
22. See section 40c of Plato's *Apology of Socrates.*
23. See § 580 of Christian Wolff's *Psychologia empirica* (1732).
24. Immanuel Kant, *The Critique of Pure Reason*, trans. J.M.D. Meiklejohn. Available at http://www.gutenberg.org/files/4280/4280-h/4280-h.htm.

25. Paul Valéry, "L'infini esthétique," in *Œuvres*, ed. Jean Hytier, vol. 2 (Paris: Gallimard, Bibliothèque de la Pléiade, 1960), 1342-1344.
26. Edmond Couchot, *La Technologie dans l'art. De la photographie à la réalité virtuelle* (Nîmes: Jacqueline Chambon, 1998), 8.
27. Benjamin, *The Work of Art...*, 42.
28. *Ibid.*, 23.
29. Marc Bloch, "Avènement et Conquête du Moulin à eau," *Annales d'histoire économique et sociale* (30 November 1935): 545. This text has been inspiring me for quite a while, ever since Pierre Macherey, Professor of Philosophy at the Sorbonne, drew my attention to it. Cf. Dominique Chateau, "La dernière séance?" *Revue d'esthétique. Le Cinéma de l'an 2000*, nouvelle série, no. 6 (1984): 115-116; "Paradigmes théoriques et innovation technologique," conference at the Symposium *The Impact of Technological Innovation* (Montréal, Cinémathèque québécoise, Arthemis/Grafics, 1-6 November 2011).
30. Marc Bloch, "Avènement et Conquête du Moulin à eau," 547.
31. Marc Bloch, "Les 'inventions' médiévales," *Annales d'histoire économique et sociale* (30 November 1935): 641.
32. Benjamin, *The Work of Art...*, 23.
33. *Ibid.*, 39-41.
34. In this case, I prefer the more literal translation of the UCLA website.
35. In the words of the translation on the UCLA website.
36. Benjamin, *The Work of Art...*, 40.
37. *Ibid.*, 41.
38. UCLA version.
39. Benjamin, *The Work of Art...*, 41.
40. "Passage parisiens. Une féérie dialectique" is the title of an article projected by the author in the late nineteen-twenties. Cf. *Paris, Capitale du XIXe siècle. Le livre des passages*, ed. Jean Lacoste et Rolf Tiederman (Paris: Les Éditions du Cerf, 2006).
41. Stendhal, *Racine and Shakespeare* (Oxford: Clarendon Press, 1907). Instead of "*modernité*," he uses the word "*romanticisme*" – derived from the Italian *romanticismo* – which will soon become "*romantisme*," then synonymous of "*modernité*"...
42. Benjamin, *The Work of Art...*, 23.
43. *Ibid.*, 274-298.
44. *Ibid.*, 23.
45. Denis Diderot, and Jean le Rond D'Alembert, *Encyclopedia*. Available at http://quod.lib.umich.edu/d/did/did2222.0000.139/–art.
46. Hari Kunzru, "Postmodernism: From the Cutting Edge to the Museum," *The Guardian*, September 15, 2011. Available at http://www.theguardian.com/artanddesign/2011/sep/15/postmodernism-cutting-edge-to-museum. This article was also published in *Courrier international*, no. 1092 (6-12 October 2011): 46-49, under the title "Requiem pour le postmoderne."
47. Cf. Francesco Casetti, "Beyond Subjectivity: The Film Experience," in *Subjectivity: Filmic Representation and the Spectator's Experience*, ed. Dominique Chateau (Amsterdam: Amsterdam University Press, 2011), 53-65.

48. Guy Debord, *La Société du spectacle* (Paris: Éditions Champ Libre, 1971), § 4; available at http://dumauvaiscote.pagesperso-orange.fr/la_societe_du_spectacle.htm.
49. Benjamin, *The Work of Art...*, 24.
50. *Ibid.*, 44, note 9.
51. *Ibid.*, 36.
52. *Ibid.*, 39.
53. *Ibid.*, 24.
54. Cf. Dominique Chateau, "La dernière séance?," *op. cit.*
55. Benjamin, *The Work of Art...*, 22.
56. *Ibid.*, 28.
57. *Ibid.*, 29-30.
58. *Ibid.*, 35.
59. Benjamin, *Écrits français*, 204.
60. Benjamin, *The Work of Art...*, 35.
61. Benjamin, *Écrits français*, 205.
62. Benjamin, *The Work of Art...*, 35.
63. *Ibid.*, 31.
64. *Ibid.*, 33.
65. *Ibid.*, 30.
66. Benjamin, *L'Homme, le Langage et la Culture*, 156-157, note 1.
67. The translators of *The Work of Art...* do not refer to it as "aestheticization" but as "aestheticizing." Because this choice tends to weaken the concept, I shall follow the example of such critics as Russell A. Berman in *Modern Culture and Critical Theory: Art, Politics and the Legacy of the Frankfurt School* (Madison: University of Wisconsin Press, 1989), chap. 2, "The Aestheticization of Politics: Walter Benjamin on Fascism and the Avant-garde," 27.
68. Benjamin, *The Work of Art...*, 22.
69. *Ibid.*, 21.
70. *Ibid.*, 22.
71. *Ibid.*, 42.
72. *Ibid.*, 41.
73. *Ibid.*
74. *Ibid.*, 54, note 36.
75. "*Communism replies by politicizing art*," *ibid.*, 42. See note 64. "Politicization," better than "politicizing" and in the same way as "aestheticization," gives the word a conceptual status — cf. Berman, *Modern Culture and Critical Theory*, 38.
76. *Ibid.*, 36.
77. In Pierre Daix, *Pour une histoire culturelle de l'art moderne: De David à Cézanne*, vol. 2 (Paris: Odile Jacob, 2000), 250.

Toward an Archaeology of the Cinema/Technology Relation: From Mechanization to "Digital Cinema"

1. This text is a revised version of a paper presented at the conference "Methods, Machines, Dispositives: Perspectives for a New Technological History of the Cin-

ema," organized by the author with Selim Krichane at the University of Lausanne in November 2012.

2. See Terry Ramsaye, *A Million and One Nights: The History of the Motion Picture* (New York: Simon and Schuster, 1926); Paul Rotha, *The Film Till Now: A Survey of the Cinema* (London: Jonathan Cape, 1930); and Robert Brasillach and Maurice Bardèche, *Histoire du cinéma* (Paris: Denoël et Steele, 1935).
3. Henri Poincaré, *Cours de M. H. Poincaré professé pendant l'année 1885-1886. Première partie: Cinématique pure – Mécanismes* (Paris: Association amicale des élèves et anciens élèves de la Faculté des sciences de Paris, 1886), 1 [my translation].
4. See Henri Bergson, *The Two Sources of Morality and Religion*, trans. R. Ashley Audra and Cloudesley Brereton (London: Macmillan, 1935), 229-275 (Chapter IV, Final Remarks: Mechanics and Mysticism).
5. Leo Marx, "*Technology*: The Emergence of a Hazardous Concept," *Technology and Culture* 51, no. 3 (July 2010): 562.
6. *Ibid.*
7. Eric Schatzberg, "*Technik* Comes to America: Changing Meanings of *Technology* before 1930," *Technology and Culture* 47, no. 3 (July 2006): 490.
8. Rick Altman, "Toward a Theory of the History of Representational Technologies," *Iris* 2, no. 2 (1984): 115.
9. *Ibid.*
10. Marc Bloch, "Technique et évolution sociale. De l'histoire de l'attelage, et de celle de l'esclavage," *Revue de synthèse historique* 41 (July 1926): 91 [my translation].
11. *Ibid.* [my translation].
12. *Ibid.* [my translation].
13. Lucien Febvre, "Réflexions sur l'histoire des techniques," *Annales d'histoire économique et sociale* 36, "Les Techniques, l'histoire et la vie" (30 November 1935): 531 [my translation]. Marc Bloch's (beautiful) essay "Avènement et conquêtes du moulin à eau" [Advent and Conquests of the Water Mill], quoted by Dominique Chateau in the previous chapter, appeared in the same issue (538-563), and can be read as, among other things, Bloch's final answer to the cavalry officer: water was another motive force, and the history of the mill interferes with the history of the harness.
14. Marc Bloch, *French Rural History*, trans. Janet Sondheimer (London: Routledge & Kegan Paul, 1966).
15. Marc Bloch, *Caractères originaux de l'histoire rurale française* (Paris: Les Belles Lettres, 1931), 15 [my translation]. The English version (*French Rural History*, trans. Janet Sondheimer [London: Routledge & Kegan Paul, 1966]) is unusable here.
16. Marcel Mauss, "Les Techniques du corps," *Journal de psychologie* 32, no. 3-4 (15 March-15 April 1936).
17. Marcel Mauss, "Techniques of the Body," in *Incorporations*, ed. Jonathan Crary and Sanford Kwinter (New York: Zone, 1994), 458.
18. *Ibid.*, 459.
19. *Ibid.*, 458.
20. *Ibid.*, 461.
21. *Ibid.*
22. *Ibid.*, 462.

23. *Ibid.*
24. *Ibid.*, 457-458.
25. Jacques Lafitte, *Réflexions sur la science des machines* (Paris: Librairie Bloud et Gay, 1932), 11 [my translation].
26. Élie Faure, "Défense et illustration de la machine," *Mercure de France* 839 (1 June 1933): 261 [my translation].
27. Faure, "Défense," 257 [my translation].
28. Gaston Bachelard, *Essai sur la connaissance approchée* [1927] (Paris: Vrin, 1973), 158-159 [my translation].
29. *Ibid.*, 156 [my translation].
30. *Ibid.*, 157 [my translation].
31. *Ibid.* [my translation].
32. *Ibid.*, 164 [my translation].
33. Bergson, *Two Sources*, 265.
34. Georges Canguilhem, "Introduction," in *Études* by Gaston Bachelard (Paris: Vrin, 1970), 8. On the notion of "Phenomenotechnique," see Hans-Jörg Rheinberger, "Gaston Bachelard and the Notion of 'Phenomenotechnique,'" *Perspectives on Science* 13, no. 3 (Fall 2005): 313-328.
35. Gaston Bachelard, "Noumène et microphysique" [1931], in *Études*, 19.
36. *Ibid.*, 34.
37. Georges Canguilhem, "Activité technique et création," *Communications et discussions, Société toulousaine de philosophie* (Toulouse: Faculté des lettres, 1937-1938); in *Écrits philosophiques et politiques 1926-1939. Œuvres complètes*, vol. 1 (Paris: Vrin, 2011), 503 [my translation].
38. Georges Canguilhem, "Descartes et la technique," *ibid.*, 497 [my translation]. See on this aspect Jan Sebestik, "Le Rôle de la technique dans l'œuvre de Georges Canguilhem," in *Georges Canguilhem. Philosophe, historien des sciences. Actes du colloque (6-7-8 décembre 1990)* (Paris: Albin Michel, 1993), 243-250.
39. Julien Pacotte, *La Pensée technique* (Paris: Félix Alcan, 1931).
40. *Ibid.*, 136 [my translation].
41. *Ibid.* [my translation].
42. *Ibid.*, 63 [my translation].
43. Florence Riou, "Le Cinéma à l'Exposition internationale de 1937: un média au service de la recherche scientifique," *1895, Revue d'histoire du cinéma* 58 (October 2009): 31.
44. *Ibid.*, 52.
45. Oswald Spengler, *Der Mensch und die Technik. Beitrag zu einer Philosophie des Lebens* (München: C.H. Beck, 1931).
46. See Aud Sissel Hauel and Ingvild Folkvord, eds, *Ernst Cassirer on Form and Technology* (Houndmills & New York: Palgrave Macmillan, 2012).
47. Ernst Cassirer, "Form und Technik," in *Kunst und Technik*, ed. Leo Kestenberg (Berlin: Wegweiser Vg., 1930), 15-61.
48. E. Panofsky, *Perspective as Symbolic Form* [1927], trans. Christopher Wood (New York: Zone, 1991), 34.
49. *Ibid.*, 154.

50. E. Panofsky, "Original und Faksimilereproduktion," *Der Kreis* 7 (1930): 3-16.
51. E. Panofsky, "On Movies," *Bulletin of the Department of Art and Archaeology of Princeton University* (June 1936): 5-15. On this text, see the important article by Thomas Y. Levin, "Iconology at the Movies: Panofsky's Film Theory," *The Yale Journal of Criticism* 9, no. 1 (1996): 27-55.
52. Walter Benjamin, "L'Œuvre d'art à l'époque de sa reproduction mécanisée," trans. Pierre Klossowski and W. Benjamin, *Zeitschrift für Sozialforschung* 5, no. 1 (1936): 40–66.

Technē and *Poiēsis*: On Heidegger and Film Theory

1. Martin Heidegger, *Discourse on Thinking*, trans. J.M. Anderson and E.H. Freund (New York: Harper & Row 1966), 54.
2. See Tom Rockmore, *Heidegger and French Philosophy: Humanism, Antihumanism, and Being* (London: Routledge, 1995), and *French Interpretations of Heidegger: An Exceptional Reception*, ed. David Pettigrew and François Raffoul (Albany: State University of New York Press, 2008).
3. See Robert Sinnerbrink, "Heidegger and the 'End of Art,'" *Literature and Aesthetics* 14, no. 1 (June 2004): 89-109. One Heidegger scholar, for example, claims that it is hard to imagine Heidegger sitting in the cinema because the cinema's sensational images does not allow for proper "dwelling"; for films immerse us in the dispersed, distracted and inauthentic world of 'das Man' ('the anyone'). Jeff Malpas, *Heidegger and the Thinking of Place: Explorations in the Topology of Being* (Cambridge, MA: MIT Press, 2012), 229.
4. Martin Heidegger, "The Turning," in *The Question Concerning Technology and Other Essays*, trans. William Lovitt (New York: Harper and Row, 1977), 48.
5. Martin Heidegger, "A Dialogue on Language between a Japanese and an Inquirer," in *On the Way to Language*, trans. P.D. Hertz (San Francisco, CA: Harper and Row, 1982), 1-54.
6. Heidegger, *Discourse on Thinking*, 48.
7. See, for example, Wilhelm S. Wurzer, *Film and Judgment: Between Heidegger and Adorno* (Atlantic Highlands, NJ: Humanities Press International, 1990).
8. Stanley Cavell, *The World Viewed: Reflections on the Ontology of Film* (Cambridge, MA: Harvard University Press, 1979), ix-xxv.
9. *Ibid.*, xiv.
10. *Ibid.*, xiv-xv.
11. *Ibid.*, xvi.
12. *Ibid.*, xvi-xvii.
13. *Ibid.*, xv.
14. See Marc Furstenau and Leslie MacAvoy, "Terrence Malick's Heideggerian Cinema: War and the Question of Being in *The Thin Red Line*," in *The Cinema of Terrence Malick: Poetic Visions of America*, ed. Hannah Patterson, 2nd ed. (London: Wallflower Press, 2007), 173-185; Robert Sinnerbrink, "A Heideggerian Cinema? On Terrence Malick's *The Thin Red Line*," *Film-Philosophy* 10, no. 3 (2006): 26-37, available at http:/www.film-philosophy.com/2006v10n3/sinnerbrink.pdf; Martin Woessner,

"What Is Heideggerian Cinema? Film, Philosophy, and Cultural Mobility," *New German Critique* 113, no. 38.2 (Summer 2011): 129-157.

15. A remarkable journey up the Danube river, THE ISTER uncovers the complex layers of history and politics, of time and technics, as revealed by Heidegger and his contemporary interpreters Philippe Lacoue-Labarthe, Jean-Luc Nancy and Bernard Stiegler. Another Heideggerian-inspired documentary, BEING IN THE WORLD (Tao Ruspoli, 2010), explores the phenomena of creativity and skilled performance, accompanied by philosophical discussion and artistic performances, and urges us to rekindle a sense of wonder in our capacity for meaningful and "masterful" being-in-the-world.
16. Martin Heidegger, "The Age of the World-Picture," in *The Question Concerning Technology and Other Essays*, trans. William Lovitt (New York: Harper and Row, 1977), 115-154.
17. Heidegger, "A Dialogue on Language," 15-17.
18. *Ibid.*, 16.
19. *Ibid.*, 17.
20. *Ibid.*
21. *Ibid.*
22. *Ibid.*
23. Count Kuki in the dialogue is actually Baron Kuki Shūzō (1888-1941), a Japanese scholar and student of Heidegger's who introduced Jean-Paul Sartre to Heidegger's work. See Lin Ma, *Heidegger and the East-West Dialogue: Anticipating the Event* (London: Routledge, 2008), 12-13.
24. Heidegger, "A Dialogue on Language," 17.
25. See Heidegger, "The Question Concerning Technology," in *Basic Writings*, ed. David Farrell Krell, 2nd revised and expanded ed. (San Francisco, CA: HarperCollins, 1993), 311-341. I discuss Heidegger's account of modern technics presently.
26. As Julian Young notes, "Kurosawa, who had studied Western painting, literature, and political philosophy, based *Yojimbo* on a Dashiell Hammett novel, *Throne of Blood* on *Macbeth*, and *Ran* on *King Lear*. He never pretended otherwise than that his films were cultural hybrids." Julian Young, *Heidegger's Later Philosophy* (Cambridge: Cambridge University Press, 2001), 149. For a fascinating exploration of both Kurosawa's film and Heidegger's dialogue see Michael B. Naas, "Rashomon and the Sharing of Voices between East and West," in *On Jean-Luc Nancy: The Sense of Philosophy*, ed. Darren Sheppard et al. (London & New York: Routledge, 1997), 63-90.
27. See, for example, Aristotle's *Metaphysics*, especially Book VII.
28. See Martin Heidegger, "Letter on Humanism" in *Basic Writings*, ed. David Farrell Krell, 2nd revised and expanded ed. (San Francisco, CA: HarperCollins, 1993), 217-265.
29. Martin Heidegger, *Being and Time*, trans. Joan Stambaugh (Albany: State University of New York Press, 1996), 2-3.
30. Heidegger, *Being and Time*, 9-12. Heidegger uses the neutral German term *Dasein* (rather than human being, ego, I, consciousness, mind etc.) in order to have a phenomenologically unmarked term to designate our specifically "human" way of

existing without importing various ontological assumptions about the meaning of the "human."

31. Heidegger, "Letter on Humanism," 231.
32. *Ibid.*
33. Heidegger, "The Question Concerning Technology," 311.
34. *Ibid.*, 330.
35. A point well made in Julian Young's *Heidegger's Later Philosophy*, 75-82.
36. Heidegger, "The Question Concerning Technology," 312.
37. *Ibid.*, 317.
38. *Ibid.*
39. *Ibid.*, 320.
40. See Young, *Heidegger's Later Philosophy*, 44ff. for an interpretation of enframing along these lines.
41. Heidegger, "The Question Concerning Technology," 320.
42. *Ibid.*, 321.
43. *Ibid.*, 322.
44. *Ibid.*
45. *Ibid.*
46. *Ibid.*
47. *Ibid.*, 326.
48. *Ibid.*, 325.
49. Heidegger, *Discourse on Thinking*, 50.
50. Heidegger, "The Question Concerning Technology," 332.
51. *Ibid.*, 332.
52. *Ibid.*, 333. Heidegger quotes Holderlin's hymn, "Patmos" (1802): "Nah ist / Und schwer zu fassen der Gott. / Wo aber Gefahr ist, wächst / Das Rettende auch."
53. *Ibid.*, 339-340.
54. See Heidegger, "The Origin of the Work of Art," in *Off the Beaten Track*, trans. Julian Young and Kenneth Haynes (Cambridge: Cambridge University Press, 2002), 1-56.
55. Heidegger, "The Question Concerning Technology," 339.
56. Heidegger, "The Origin of the Work of Art."
57. Heidegger, "The Question Concerning Technology," 339.
58. See Robert Sinnerbrink, "Heidegger and the 'End of Art,'" *Literature and Aesthetics* 14, no. 1 (June 2004): 89-109.
59. *Ibid.*, 339.
60. See Walter Benjamin, "The Work of Art in the Age of Its Technical Reproducibility: Third Version," in *Selected Writings, Volume 4: 1938-1940*, ed. Howard Eiland and Michael W. Jennings (Cambridge, MA: Harvard University Press, 2003), 251-283.
61. Benjamin, "The Work of Art in the Age of Its Technical Reproducibility."
62. Heidegger, "The Question Concerning Technology," 340.
63. *Ibid.*, 339-340.
64. Martin Heidegger, *Identity and Difference*, trans. Joan Stambaugh (New York: Harper and Row, 1969). See also Robert Sinnerbrink, "*Ereignis*, Technology, Art: Poetic Dwelling in the Later Heidegger," *Literature and Aesthetics* 16, no. 1 (July 2006): 81-94.

65. Heidegger, "The Question Concerning Technology," 334.
66. *Ibid.*, 338.
67. *Ibid.*, 337.
68. *Ibid.*, 339.
69. Stanley Cavell's *The World Viewed*; Bernard Stiegler's *Technics and Time 1: The Fault of Epimetheus*, trans. Stephen Barker (Stanford: Stanford University Press, 1994), B. Stiegler, *Technics and Time 2: Disorientation*, trans. Stephen Barker (Stanford: Stanford University Press, 2008); and Stephen Mulhall's *On Film*, 2nd ed. (London & New York: Routledge, 2008), are just a few notable examples of the ways in which Heidegger's thought has made its mark in recent philosophy of cinema.
70. Cf. "I call the comportment which enables us to keep open to the meaning hidden in technology, *openness to the mystery*." Heidegger, *Discourse on Thinking*, 55.

Stiegler's Post-Phenomenological Account of Mediated Experience

1. Bernard Stiegler, "An Organology of Dreams," trans. Daniel Ross, *Screening the Past* 36 (2013): paragraph 18 (references will be to paragraphs for this non-paginated online publication). Available at http://www.screeningthepast.com/2013/06/the-organology-of-dreams-and-arche-cinema/.
2. Steven Shaviro in "Post-Cinematic Affect: On Grace Jones, *Boarding Gate* and *Southland Tales*," *Film-Philosophy Journal* 14, no. 1 (2010), available at http://www.film-philosophy.com/index.php/f-p/issue/view/14, uses this term to characterize certain digital film and video aesthetics and the affects they generate in an essay that revises and updates some of the principal themes of earlier work on postmodernist technocultural and aesthetic transformations. I use it here more to characterize the continuity (and transformations) of the technological conditions of mediation of these industrial media forms that developed in the wake of the cinema's establishing of an audiovisual temporal experience designed to coordinate the attention of spectators/users with its unfolding.
3. On disorientation, see Bernard Stiegler, *Technics and Time 1: The Fault of Epimetheus*, trans. Richard Beardsworth and George Collins (Stanford: Stanford University Press, 1998), 92. See also Stiegler, *Technics and Time 2: Disorientation*, trans. Stephen Barker (Stanford: Stanford University Press, 2009), 1-2.
4. This is not to mention the contribution it makes to what has recently (if somewhat belatedly) been termed the "phenomenological turn" in film studies (see the recent one day symposium held at Queen Mary University, London, with this title, http://filmstudies.sllf.qmul.ac.uk/events/phenomenological-turn). Most of this work has been informed by Maurice Merlau-Ponty's philosophy and to a lesser extent that of Martin Heidegger. In this regard, Stiegler's return to Husserl's efforts to ground a phenomenological inquiry should be approached as a critical rethinking of the nature and stakes of such as "phenomenological turn."
5. Stiegler, *Technics and Time* 1, 177. Stiegler takes the description of the human as "technical life" from Georges Canguilhem, but his principal source for developing this account of the human is the philosophical anthropology of Andre Leroi-Gourhan. Leroi-Gourhan's account of hominization as achieved via the "exteriorization"

of organic, biological functions through the human development of technics is adopted by Stiegler in *Technics and Time 1* and inspires his propositions concerning the human as a being always becoming something else in a permanent dynamic with the developmental dynamic of its exteriorized elements (see pp.134-179).

6. *Ibid*. See Martin Heidegger, *Being and Time*, trans. John Macquarrie and Edward Robinson (Oxford: Basil Blackwell, 1962), 71.
7. Stiegler, *Technics and Time 1*, 177.
8. Stiegler, "An Organology of Dreams," paragraph 15.
9. See André Leroi-Gourhan's account of recurring images and symbols in the earliest rupestral art in Europe in *Gesture and Speech*, trans. Anna Bostock Berger (Cambridge, MA: MIT Press, 1994), 190-200.
10. *Ibid*., 193.
11. *Ibid*., 199ff.
12. Stiegler, "An Organology of Dreams," paragraph 15.
13. Leroi-Gourhan, *Gesture and Speech*, 200-203.
14. See Stiegler, *Technics and Time 2* for an extended discussion of the emergence of orthographic writing and the nature and consequences of its transformation of grammatization (in particular, the first two chapters).
15. It is worth recalling that alphabetic writing is a digital technics, resting on the oppositional discretizing of alternative symbolic elements analyzed by Saussure. See Anthony Wilden's *System and Structure: Essays in Communication and Exchange*, 2nd ed. (London: Tavistock Press, 1980).
16. The Chauvet-Pont-d'Arc cave in the Ardeche river valley in southern France was discovered in 1994. The wall paintings are thought to be amongst the earliest known from the Upper Paleolithic era, dated around 30,000 years ago. Chauvet is subject of the 3D documentary by Werner Herzog, CAVE OF FORGOTTEN DREAMS (2010) and the book (and film) by Marc Azéma, *La Préhistoire du cinema* (The Prehistory of Cinema, 2006), both of which Stiegler cites in connection to his discussion of "Archi-cinema." Azéma, for instance, makes an explicit case for the cinematic character of the Chauvet graphics, how they indicate motion in a manner resembling Muybridge and Marey's proto-cinematic imaging practices, and how the contours of the cave wall, in combination with the "projection" conditions of flickering firelight, appear to have been mobilized in the design of a convincing impression of the movement of figures.
17. There is considerable commentary on the relation between Stiegler's work and that of his mentor, Derrida. See, for instance, essays by Ben Roberts, David Wills, Patrick Crogan, Daniel Ross, and Ian James. In *Technics and Time 1* (and elsewhere) Stiegler positions his account of technics as a dialogue with Derrida's analysis of supplementarity in *Of Grammatology* (136ff). In a more recent interview he draws a more distinct line between his more historical and empirically oriented account of technics and human technicity and the more transcendental leaning of Derrida's "philosophemes" such as "archi-writing" (see Bernard Stiegler, Ben Roberts, Jeremy Gilbert and Mark Hayward, "A Rational Theory of Miracles: On Pharmacology and Transindividuation," trans. Ben Roberts, *New Formations* no. 77 (2012): 164-184 (quotation from p. 165). In an earlier essay on Derrida's work, however, Stiegler

points out that in the Exergue to *Of Grammatology* Derrida sets out to respond to the threat posed by the cybernetic and non-phonetic "dislocation" and subversion of language already underway in modern technoscience with another deconstruction [see Stiegler, "Derrida and Technology: Fidelity at the Limits of Deconstruction and the Prosthesis of Faith," trans. Richard Beardsworth, in *Jacques Derrida and the Humanities: A Critical Reader*, ed. T. Cohen (Cambridge: Cambridge University Press, 2001)]. In a sense Stiegler's activism can be understood as a particular adoption of Derrida's thought that picks up the threads from this situated contextual engagement announced at its beginnings in mid-1960s Cold War Europe.

18. Stiegler, "An Organology of Dreams," paragraph 31. Marc Azéma, *La préhistoire du cinema: Origines paléolithique de la narration graphique et du cinématographe* (Paris: Errance, 2006).
19. Stiegler, "An Organology of Dreams," paragraph 28. The "desiring and dreaming beings that we are" for now at least; there is nothing guaranteeing the permanence of this kind of being given the radically contingent and historical nature of human being as a becoming, one which Stiegler has glossed, in a commentary on discourses of the so-called "post-human" pathways opening up today via biotechnologies and cyborg technics, as one in which the human is always a project(ion) that is never fully realized, and for which there is no *inevitable* realization. See *What Makes Life Worth Living: On Pharmacology*, trans. Daniel Ross (Cambridge: Polity, 2013), 104-106.
20. Stiegler, "An Organology of Dreams," paragraph 1.
21. *Ibid.*, paragraph 36.
22. Edmund Husserl, *On the Phenomenology of the Consciousness of Internal Time (1893-1917)*, trans. John Barnett Brough (Dordrecht: Kluwer Academic Publishers, 1991), 33. Husserl uses the term "temporal object" for such phenomena, noting that while all objects of consciousness are temporal in a general sense, and will change in time, what he designates as "temporal objects" are those such as melody which take time to be perceived in their entirety as a discrete, coherent phenomenon (7).
23. In *États de choc: Bêtise et savoir au XXIe siècle* (Paris: Mille et une nuits, 2012), Stiegler comments that Husserl himself approaches such a revision of his project in his last published work, "The Origin of Geometry," wherein he in effect "accords a *phenomenological* status to the tertiary retention [namely, the annotations of the 'proto-geometers' whose work led to the formulation of the first apodictic, ideal theorems of geometry] he had hitherto relegated to the sphere of the constituted world and to the everyday empiricism that he had termed the 'natural attitude.' It is necessary, however, to put quote marks around the epithet 'phenomenological' accorded to the new status of tertiary retention here, inasmuch as the fundamental principles of phenomenology are put in question through its becoming constitutive of reason" (85, my translation).
24. Stiegler provides a lengthy commentary on Husserl's work on internal time consciousness in the final chapter of *Technics and Time 2*, a commentary which is resumed and provides the platform for the account of cinema and cinematic consciousness in the opening chapters of *Technics and Time 3: Cinematic Time and the Question of Malaise*, trans. Stephen Barker (Stanford: Stanford University Press,

2011). It is beyond the scope of this essay to give a detailed account adequate to the complexities of this commentary. I have elsewhere attempted to address some of these; see, for instance, Patrick Crogan, "'Passing, Swirling, Spinning:' A Brief Note on Stiegler's Post-Phenomenological Account of Mediated Experience," *Technophilia blog*, June 2013, http://technophilia.wordpress.com/2013/07/03/passing-swirling-spinning-a-brief-note-on-stieglers-post-phenomenological-account-of-mediated-experience/.

25. Husserl's philosophical methodology responded to what he (among others such as his contemporary, Henri Bergson) saw as the classic impasse of 19th-century conflicts between idealist and empiricist epistemological frameworks in philosophy and the sciences.
26. Husserl speaks of the "falling away" of present moments, and of their "running off" (*The Internal Consciousness of Time*, 29). See also Stiegler's analysis of retention as modification in *Technics and Time 2*, 212ff, and as reduction which makes the experience of time as what passes possible in *Technics and Time 3*, 19.
27. Husserl, *The Internal Consciousness of Time*, 33.
28. *Ibid.*, 31.
29. This is so even when the note or shot conforms to its protention and is, as one says of a boring work, "absolutely predictable." In this case it demonstrates what Stiegler terms in "An Organology of Dreams" a "stereotypical" conformity to the protention. Alluding to Freud's analysis of trauma in resuming this analysis of Husserl's account of retentional modes in consciousness, Stiegler states that one can class perceptual impressions in a range between "stereotypical" and "traumatypical" depending on the extent to which they conform to the protentions conditioning consciousness's perception. But even the most stereotypical perception has the effect of "impoverishing" the temporal object so that "the attention consciousness has for this object fades away, disindividuating itself by reinforcing these stereotypes."
30. See the section entitled "Passing, Swirling, Spinning" in Stiegler *Technics and Time 2*, 210-214.
31. Stiegler, *Technics and Time 2*, 204-205. The "tone" only becomes a "note" in a melody on condition of consciousness's experience of the melodic and it is this dimension of the constitution of the temporal object that Husserl ignores or avoids in reducing the note to the tone of primary impressional content. Stiegler considers the reading of a poem in a similar way (203-204).
32. I am reminded of the possibly apocryphal but nonetheless instructive anecdote about the "Westernization" of Meiji Restoration Japan: a Japanese diplomatic mission to France are taken to a symphonic concert. Asked about how they enjoyed the concert, the spokesperson advised that they found it interesting, but that the "first part" had been the best part of the performance. He was referring to the sounds of the orchestra as they tuned their instruments before commencing the symphony.
33. Stiegler, *Technics and Time 2*, 210.
34. Stiegler, *Technics and Time 3*, 10-11.

35. Jonathan Beller, *The Cinematic Mode of Production: Attention Economy and the Society of the Spectacle* (Lebanon, NH: Dartmouth University Press, 2006).
36. Stiegler, *Technics and Time 3*, 37-38. In effect Stiegler suggests that had Husserl considered the melody as heard on the phonograph – already in widespread use in his day – he might have had cause to rethink the strict separation of primary and secondary retention and, thereby, the very grounding of phenomenology in such an absolute distinction between perception and imagination, and interiority and exteriority.
37. Both Beller and Stiegler term Hollywood the capital of the 20th century (*The Cinematic Mode of Production*, 193), and of "Industrial Schematism" (*Technics and Time 3*, 37).
38. Stiegler, "An Organology of Dreams," paragraph 49.
39. *Ibid.*
40. Roland Barthes, *Camera Lucida: Reflections on Photography*, trans. Richard Howard (New York: Hill and Wang, 1981), and André Bazin, "The Ontology of the Photographic Image," in *What Is Cinema?*, trans. Hugh Gray, vol. 1 (Berkeley: University of California Press, 1967).
41. D.N. Rodowick, *The Virtual Life of Film* (Cambridge, MA: Harvard University Press, 2007), 64.
42. The key sources for this ideological-psychoanalytic theorization of cinema spectatorship via Althusser's work were texts by Jean-Louis Baudry and Christian Metz, such as Baudry, "Ideological Effects of the Basic Cinematographic Apparatus," in *Narrative, Apparatus, Ideology*, ed. Philip Rosen (New York: Columbia University Press, 1986), and Metz, *Psychoanalysis and Cinema: The Imaginary Signifier*, trans. Celia Britton et al. (London: Macmillan, 1982). Its extension and elaboration was carried on in an anglophone context in journals such as *Screen*, *October* and *Camera Obscura*.
43. In "An Organology of Dreams," Stiegler says "[...] this cinema of caves and theatres is staged by Plato at the beginning of book VII of the *Republic* as a kind of dream: as the dream of that dream that would be the lie of life lived in the cave – that is, in the *pharmakon*. Now, we see that whereas the philosopher wants to leave the cave, the film-lover, the *amateur de cinéma*, would like to get behind the camera or into the screen: what the cinephile loves is the *pharmakon* and the pharmacological condition itself *insofar as it is also the condition of desire*" (paragraph 34).
44. Max Horkheimer and Theodor W. Adorno, *Dialectic of Enlightenment*, trans. E. Jephcott (Stanford: Stanford University Press, 2002), 98.
45. Stiegler, *Technics and Time 3*, 74.
46. Stiegler, "An Organology of Dreams," paragraph 23.
47. Stiegler, "Faire du Cinéma," unpublished keynote address delivered at the Impact of Technological Innovations on the Theory and Historiography of Cinema conference (Montréal, November 2011) and "An Organology of Dreams."
48. Bernard Stiegler, *La Télécratie contre la démocratie: Lettre ouverte aux représentants politiques* (Paris: Flammarion, 2006), 221.
49. See D.N. Rodowick, *The Crisis of Political Modernism: Criticism and Ideology in Contemporary Film Theory* (Berkeley: University of California Press, 1994).

What Are Media?

1. Boris Groys, *Unter Verdacht: Eine Phänomenogie der Medien* (Munich: Hanser, 2000).
2. Maurice Merleau-Ponty, *The Prose of the World*, ed. Claude Lefort, trans. John O'Neill (Evanston, IL: Northwestern University Press, 1973), 9-10.
3. See Maurice Merleau-Ponty, *The Visible and the Invisible*, ed. Claude Lefort, trans. Alphonso Lingis (Evanston, IL: Northwestern University Press, 1968), 30.
4. Christian Bermes, "Medialität – anthropologisches Radikal, oder ontologisches Prinzip? Merleau-Ponty's Ausführung der Phänomenologie" [Mediality – Anthropological Radical or Ontological Principle? Merleau-Ponty's Elaboration of Phenomenology], in *Die Stellung des Menschen in der Kultur: Festschrift für Ernst Wolfgang Orth*, ed. Christian Bermes, Julia Jonas and Karl-Heinz Lembeck (Würzburg: Königshausen und Neumann, 2002), 49.
5. Matthias Vogel, *Medien der Vernunft: Eine Theorie des Geistes und der Rationalität auf Grundlage einer Theorie der Medien* (Frankfurt a.M.: Suhrkamp, 2001), 13, 136, 133.
6. Georg Christoph Tholen, *Die Zäsur der Medien: Kulturphilosophische Konturen* (Frankfurt a.M.: Suhrkamp, 2002), 50, 8, 19.
7. Vogel, *Medien der Vernunft*, 144.
8. Edmund Husserl, *Logical Investigations*, trans. J.N. Findlay, ed. Dermot Moran (London: Routledge, 2001), pt. 1, chap. 8, § 46, 110.
9. *Ibid.*
10. *Ibid.*, 109.
11. *Ibid.*, pt. 1, chap. 7, § 36, 80.
12. [The distinction between *das gleiche* (What is equal, equivalent, or the same) and *dasselbe* (What is the same and identical with itself) can only insufficiently be rendered in English. The example in the next paragraph, however, will clarify the point. – Trans.]
13. Husserl, *Logical Investigations*, pt. 1, chap. 7, § 36, 80.
14. *Ibid.*, pt. 1, chap. 8, § 46, 109.
15. Lorenz Engell and Joseph Vogl, "Vorwort," *in Kursbuch Medienkultur: Die MaBgeblichen Theorien von Brecht bis Baudrillard*, ed. Claus Pias, Joseph Vogl, Lorenz Engell, Oliver Fahle and Britta Neitzel (Stuttgart: DVA, 1999), 8-11, 10.
16. Hans Jonas, "Homo Pictor and the Differentia of Man," *Social Research* 29, no. 2 (Summer 1962): 201-220, 207.
17. Husserl, *Logical Investigations*, pt. 1, 5th Investigation, supplement to §§ 11 and 20, 126 [entirely retranslated].

The "History of Vision"-Debate Revisited

1. See Karl Marx, "Private Property and Communism" [1956], in *Economic and Philosophic Manuscripts of 1844* (Mineola, NY: Dover, 2011); Walter Benjamin, "The Work of Art in the Age of Its Technical Reproducibility: Third Version," in *Selected Writings, Volume 4: 1938-1940*, ed. Howard Eiland and Michael W. Jennings (Cambridge, MA: Harvard University Press, 2003), 251-283; and *The Arcades Project* (Cambridge, MA: Belknap Press, 1999); Georg Simmel, "The Metropolis and Mental Life"

[1903], in *Simmel on Culture: Selected Writings* (London: Sage, 1997), 174-186, and "Sociology of the Senses" [1907], in *Simmel on Culture*, 109-119.

2. Ben Singer, *Melodrama and Modernity: Early Sensational Cinema and Its Contexts* (New York: Columbia University Press, 2001).
3. See e.g., David M. Levin, ed., *Modernity and the Hegemony of Vision* (Berkeley: University of California Press, 1994).
4. See Annemone Ligensa and Klaus Kreimeier, eds, *Film 1900: Technology, Perception, Culture* (New Barnet: Libbey, 2009). This collection is based on a conference of the research project "The Industrialisation of Perception," which was a part of the research center *Medienumbrüche* at the University of Siegen, Germany, between 2002 and 2009. As separate publications of the various members reveal, even within the research project itself there was no consensus regarding the "modernity thesis."
5. For an overview, see, e.g., Singer, *Melodrama and Modernity* and Wanda Strauven, ed., *The Cinema of Attractions Reloaded* (Amsterdam: Amsterdam University Press, 2006).
6. Noël Carroll, "Modernity and the Plasticity of Perception," *Journal of Aesthetics and Art Criticism* 59, no. 1 (2001): 11-17; Frank Kessler, "Viewing Change, Changing Views: The 'History of Vision'-Debate," in *Film 1900: Technology, Perception, Culture*, ed. Annemone Ligensa and Klaus Kreimeier (New Barnet: Libbey, 2009), 23-36.
7. Simmel, "Sociology of the Senses," 118-119.
8. Simmel, "The Metropolis and Mental Life," 175-176.
9. Wolfgang Schivelbusch, *The Railway Journey: Trains and Travel in the 19th Century* (Oxford: Blackwell, 1980). Simmel's "protective organ" is similar to Freud's "stimulus shield," but preceded it; Simmel never mentioned sources, but Freud usually did; he did not refer to Simmel or anyone else in this case, so the genealogy of the idea is unknown.
10. See, e.g., Malcolm MacMillan, *Freud Evaluated: The Completed Arc* (Amsterdam: North Holland, 1991), 528-530.
11. Edward S. Reed, "Seeing through History," *Philosophy of the Social Sciences* 16, no. 2 (June 1986): 242. See also Donald M. Lowe, *History of Bourgeois Perception* (Chicago: University of Chicago Press, 1982).
12. On the general issue of the subject in post-structuralist theory, see, e.g., James Heartfield, *The Death of the Subject Explained* (Sheffield: Sheffield Hallam University Press, 2002). The concept of "media as perception" seems to be particularly popular in Germany, see, e.g., Ralf Schnell, *Medienästhetik: zur Geschichte und Theorie audiovisueller Wahrnehmungsformen* (Stuttgart: Metzler, 2000).
13. Carroll, "Modernity and the Plasticity of Perception." See also Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (Cambridge, MA: MIT Press, 1990), and *Suspensions of Perception: Attention, Spectacle, and Modern Culture* (Cambridge, MA: MIT, 1999).
14. Gernot Böhme, "Technisierung der Wahrnehmung: zur Technik- und Kulturgeschichte der Wahrnehmung," in *Technische Zivilisation: zur Aktualität der Technikreflexion in der gesellschaftlichen Selbstbeschreibung*, ed. Jost Halfmann (Opladen: Leske und Budrich, 1998), 31-47. See also Paul Feyerabend, *Against Method: Outline of an Anarchistic Theory of Knowledge* (London: NLB, 1975).

15. See, e.g., Nouchine Hadjikhani et al., "Early (N170) Activation of Face-Specific Cortex by Face-Like Objects," *Neuroreport* 20, no. 4 (March 2009): 403–407.
16. This is not to be confused with subconscious perception, see, e.g., Philip M. Merikle and Meredyth Daneman, "Psychological Investigations of Unconscious Perception," *Journal of Consciousness Studies* 5 (1998): 5-18.
17. Zenon Pylyshyn, "Is Vision Continuous with Cognition? The Case For Cognitive Impenetrability of Visual Perception," *Behavioral and Brain Sciences* 22, no. 3 (June 1999): 341-365.
18. Ludwig Wittgenstein, *Tractatus Logico-Philosophicus* (London: Kegan Paul, 1922), 90.
19. See, e.g., Michael Schenk, *Medienwirkungsforschung* (Tübingen: Mohr Siebeck, 2012).
20. See, e.g., Arthur De Vany, *Hollywood Economics: How Extreme Uncertainty Shapes the Film Industry* (London: Routledge, 2003).
21. Benjamin, "The Work of Art in the Age of Its Technical Reproducibility: Third Version," 280n42.
22. Singer, *Melodrama and Modernity*.
23. See, e.g., Charles Gilbert, "Neural Plasticity," in *The MIT Encyclopedia of the Cognitive Sciences*, ed. Robert A. Wilson and Frank C. Keil (Cambridge, MA: MIT Press, 1999), 598–601.
24. Torben Kragh Grodal, *Embodied Visions: Evolution, Emotion, Culture, and Film* (Oxford: Oxford University Press, 2009), 17.
25. Singer mostly refers to research conducted with animals, but regarding cognitive skills one might add the observation that general intelligence has increased during the last 100 years, despite the fact that it is influenced by genetic factors. This phenomenon is known as the "Flynn effect," named after its discoverer, who argues that it is not merely due to changes in measurement. See Robert R. Flynn, *What Is Intelligence? Beyond the Flynn Effect* (Cambridge: Cambridge University Press, 2007).
26. Laurent Brondel and Michel Cabanac, "Alliesthesia in Visual and Auditory Sensations from Environmental Signals," *Physiology and Behavior* 91 (2007): 196–201.
27. Henri Bergson, *Creative Evolution* [1907] (New York: Holt, 1911).
28. Michael Chanan has already pointed this out, but his own account of how film creates the impression of motion is not quite accurate; see *The Dream That Kicks: The Prehistory and Early Years of Cinema in Britain* (London: Routledge, 1980).
29. Harro Segeberg, "'Is Everything Relative?' Cinema and the Revolution of Knowledge around 1900," in *Film 1900: Technology, Perception, Culture*, ed. Annemone Ligensa and Klaus Kreimeier (New Barnet: Libbey, 2009), 67.
30. Examples of this kind are David A. Cook, *A History of Narrative Film* (New York: Norton, 2004) and Ralf Schnell, "Medienästhetik," in *Handbuch der Mediengeschichte*, ed. Helmut Schanze (Stuttgart: Kröner, 2001), 72-95.
31. Joseph and Barbara Anderson have already pointed this out, but there is some new research to add. See Joseph Anderson and Barbara Anderson, "The Myth of Persistence of Vision Revisited," *Journal of Film and Video* 45, no. 1 (Spring 1993): 3-12, and Joseph Anderson and Barbara Fisher, "The Myth of Persistence of Vision," *Journal of the University Film Association* 30, no. 4 (Fall 1978): 3-8.

32. See Robert M. Steinman et al., "Phi Is Not Beta, and Why Wertheimer's Discovery Launched the Gestalt Revolution," *Vision Research* 40 (2000): 2257-2264.
33. See Dale Purves et al., "The Wagon Wheel Illusion in Movies and Reality," *Proceedings of the National Academy of Science (USA)* 93 (April 1996): 3693-3697.
34. See, e.g., Oliver Braddick, "The Many Faces of Motion Perception," in *The Artful Eye*, ed. Richard L. Gregory (Oxford: Oxford University Press, 1995), 205-231.
35. See Anderson and Anderson, "The Myth of Persistence of Vision Revisited."
36. Benjamin H. Detenber, "The Effects of Picture Motion on Emotional Responses," *Journal of Broadcasting and Electronic Media* 42, no. 1 (1998): 113-127.
37. See, e.g., Richard L. Gregory, *Eye and Brain: The Psychology of Seeing* (Oxford: Oxford University Press, 1966).
38. See, e.g., Joachim Paech, "Das Sehen von Filmen und filmisches Sehen: Anmerkungen zur Geschichte der filmischen Wahrnehmung im 20. Jahrhundert," in *Sprung im Spiegel: Filmisches Wahrnehmen zwischen Fiktion und Wirklichkeit*, ed. Christa Blümlinger (Vienna: Sonderzahl, 1990), 33-50.
39. See, e.g., Nicholas Pastore, *Selective History of Theories of Visual Perception, 1650-1950* (Oxford: Oxford University Press, 1971).
40. Richard Nisbett, *The Geography of Thought: How Asians and Westerners Think Differently ... and Why* (New York: Free Press, 2003).
41. See, e.g., Timothy Screech, "The Meaning of Western Perspective in Edo Popular Culture," *Archives of Asian Art* 47 (1994): 58-68.
42. See, e.g., Dahlia W. Zaidel, *Neuropsychology of Art: Neurological, Cognitive, and Evolutionary Perspectives* (Hove: Psychology Press, 2005).
43. See, e.g., Gordon L. Patzer, *The Power and Paradox of Physical Attractiveness* (Boca Raton, FL: BrownWalker Press, 2006).
44. For examples see, e.g., Frank Kessler, "What You Get Is What You See: Digital Images and the Claim on the Real," in *Digital Material: Tracing New Media in Everyday Life and Technology*, ed. Marianne van den Boomen et al. (Amsterdam: Amsterdam University Press, 2009), 187-97.
45. See, e.g., Arthur K. Wheelock, *Perspective, Optics and Delft Artists around 1650* (London & New York: Garland, 1973).
46. Carroll, "Modernity and the Plasticity of Perception."
47. See, e.g., Ien Ang, *Desperately Seeking the Audience* (London: Routledge, 1991) or Irmela Schneider, "Zur Archäologie der Mediennutzung: zum Zusammenhang von Wissen, Macht und Medien," in *Kulturindustrie Reviewed: Ansätze zur kritischen Reflexion der Mediengesellschaft*, ed. Barbara Becker and Josef Wehner (Bielefeld: transcript, 2006), 83-102. For example, along the lines of Michel Foucault's critique of knowledge as control, Schneider compares the questionnaire methods of empirical audience research to the Spanish Inquisition.
48. See, e.g., Richard C. Strohman, "The Coming Kuhnian Revolution in Biology," *Nature Biotechnology* 15 (March 1997): 194-199.
49. Reed, "Seeing through History," 244.
50. As John R. Searle argues, mind-body dualism is still a logical and practical necessity even for materialists. See "How to Study Consciousness Scientifically," *Philoso-*

phical Transactions of the Royal Society of London, Part B 353, no. 1377 (1998): 1935-1942.

51. Sherry, "Media Effects Theory and the Nature/Nurture Debate," 92-93.

Will the 3D Revolution Happen? A Brief Perspective on the Long History of Stereoscopy (with special thanks to Eisenstein and Bazin)

1. In his lengthy and well-informed survey of the state of 3D cinema, Thomas Elsaesser records the view that 3D may have been little more than a ploy to finance wholesale digital conversion: Elsaesser, "The 'Return' of 3-D: On Some of the Logics and Genealogies of the Image in the Twenty-First Century," *Critical Inquiry* 39 (Winter 2013): 221-222.
2. Roger Ebert, "Why I Hate 3-D (and You Should Too)," *Newsweek*, May 20, 2010, available at http://www.thedailybeast.com/newsweek/2010/04/30/why-i-hate-3-d-and-you-should-too.html. See also Mark Kermode: "3D exists not to enhance the cinematic experience, but as a pitiful attempt to head off piracy and force audiences to watch films in overpriced, undermanned multiplexes," in "No, Your Eyes Aren't Deceiving You – 3D Really Is a Con," *The Observer*, April 11, 2010, available at http://www.theguardian.com/commentisfree/2010/apr/11/3d-avatar-hollywood.
3. Ebert, "Why I Hate 3-D... "
4. Northern Alliance and Ipsos MediaCT study *Opening Our Eyes: How Film Contributes to the Culture of the UK* (London: UK Film Council/British Film Institute, 2011), available at http://www.bfi.org.uk/about-bfi/policy-strategy/opening-our-eyes-how-film-contributes-culture-uk, 58-61.
5. See T. Troscianko, T.S. Meese, and S. Hinde, "Perception While Watching Movies: Effects of Physical Screen Size and Scene Type," *i-Perception* 3, no. 7 (2012): 414-425; also later unpublished work by Hinde comparing responses to AVATAR in 2D and 3D, which record greater feeling of "presence" with the latter. Kermode claims that "as anyone who has watched AVATAR in both 2D and 3D versions will know, the wow factor of this sci-fi *Smurfahontas* is more the result of adventurous digital landscaping than any forced stereoscopic illusion." *loc cit.*
6. Kermode, "No, Your Eyes Aren't Deceiving You."
7. Elsaesser, "The 'Return' of 3-D...," 318.
8. Editorial "As Is" by Kenneth Macpherson, in: *Close Up* 3, no. 3 (1928): 13.
9. O. Winter, "The Cinematograph," *New Review*, May 1896; reproduced in *Sight & Sound* (Fall 1982): 51-54.
10. See for instance, Rudolf Arnheim, *Film* [1933], partially reproduced in *Film as Art* (London: Faber, 1969), 129.
11. André Bazin, "The Myth of Total Cinema," in *What Is Cinema?* vol. 1, ed. Hugh Gray (Berkeley & Los Angeles: University of California Press, 1967), 20.
12. Relief can be translated as "depth," "relief" (as in raised), or referring to stereoscopy, which was clearly the sense intended by Bazin in this case.

13. Bazin, "The Myth of Total Cinema," 20. This seems to be a miscitation of Georges Potonniée, *Les origines du cinématographe* (Paris: Publications Photographique Paul Montel, 1928).
14. *Ibid.*
15. André Bazin, "Un nouveau stade du cinéma en relief: le relief en equations," *Radio, Cinéma, Télévision*, no. 131 (20 July 1952): 5. I was first alerted to this by Grant Weidenfeld's essay, "Bazin on the Margins of the Seventh Art," in *Opening Bazin: Postwar Film Theory and Its Afterlife*, ed. Dudley Andrew and Hervé Joubert-Laurencin (New York: Oxford University Press, 2011). Norman McLaren's films were AROUND AND AROUND and NOW IS THE TIME TO PUT ON YOUR GLASSES (both 1951, 10 mins), co-produced by the Canadian National Film Board and BFI Experimental Film Fund. For an account of the making of AROUND AND AROUND, see the catalogue, *Norman McLaren* (Edinburgh: Scottish Arts Council, 1977), 26. Also shown at the Festival was a documentary A SOLID EXPLANATION, featuring Raymond Spottiswoode, and filmed at London Zoo, which Peter Wollen recalled in his "An Alphabet of Cinema," in *Paris Hollywood: Writings on Cinema* (London: Verso, 2002), 17.
16. Bazin, "Un nouveau stade," 5. Bazin refers here to L'ARRIVÉE D'UN TRAIN À LA CIOTAT.
17. *Ibid.*
18. By its translator, Catherine de la Roche, "About Stereoscopic Cinema," *Penguin Film Review* 8 (1949): 5. Marie Seton dated this "long article on stereoscopic films" to the period around Eisenstein's 50th birthday on 23 January, *Sergei M. Eisenstein: A Biography* (New York: Grove Press, 1960), 474.
19. Sergei Eisenstein, *Notes of a Film Director* (New York: Dover Publications, 1970), 129-137. This collection is stated to be "a corrected republication of the English translation (by X. Danko) of *Zamyetski Kinoryezhissyora* (compiled and edited by R. Yurenev, originally issued by the Foreign Languages Publishing House, Moscow, n.d. [after 1948]." Richard Griffiths wrote in his foreword that "Eisenstein himself published the present collection, to which its translator has subsequently added three articles written later." However, since Eisenstein died in February 1948, the exact date and provenance of the essay remain unclear.
20. According to some accounts, this film had been completed some years earlier, but its release was presumably delayed by the war.
21. Eisenstein, "Stereoscopic Films,"129.
22. Ivanov's system involved two interlocked 70mm prints projected onto a special beaded screen, whose pattern "is located at a certain distance from the reflecting surface; this permits the perception of two different images by the left and right eyes." *The Great Soviet Encyclopedia*, 3rd ed. (New York: Macmillan; London: Collier Macmillan, 1970-1979). The Ivanov system was demonstrated with short films, such as CONCERT, shown in a specially equipped Moscow cinema in 1941, followed by cinemas in other Soviet cities. See Mark Schubin, "3D: The Next Big Thing?" *The Schubincafe*, December 31, 2011, available at http://www.schubincafe.com/tag/stereo-kino/.
23. Eisenstein, "Stereoscopic Films," 129.

24. *Ibid.*, 135.
25. Louis Chavance, "Au Temps du Centenaire," *Le Magasin du spectacle*, no. 2 (Paris: Robert Laffont, 1946).
26. Eisenstein, "Stereoscopic Films," 137.
27. Sergei Eisenstein, "Purveyors of Spiritual Poison," *Sight and Sound* 16, no. 63 (1947): 103.
28. I have used the French translation of the full text, "Du cinéma en relief," included in *Eisenstein: le movement de l'art*, eds. Naum Kleiman and François Albera (Paris: Editions du Cerf, 1986), 97-158. A new English translation by Sergey Levchin, has appeared in the Canadian journal *Public*, no. 47 (Spring 2013), which I was not able to consult before this publication went to press.
29. For an evolutionary biological approach to cinema, see Torben Grodal, *Embodied Vision: Evolution, Emotion, Culture and Film* (New York: Oxford University Press, 2009). Also Grodal, "Tapping into our Tribal Heritage: LORD OF THE RINGS and Brain Evolution," in *Audiences: Defining and Researching Screen Entertainment Reception*, ed. Ian Christie (Amsterdam: Amsterdam University Press, 2012), 128-142.
30. Bazin, "Du cinéma en relief," 98. Bertolt Brecht had earlier compared sport as a field where spectators are active and informed with the passive audiences for theater. See his essay "Emphasis on Sport" cited in John Willett, ed. and trans., *Brecht on Theatre: The Development of an Aesthetic* (New York: Hill and Wang, 1977), 6.
31. Bazin, "Du cinema en relief," 98.
32. According to Eisenstein, this image was based on Hiroshige's print of a landscape with a bird dominating the foreground, from the *Hundred Views of Edo* (1857).
33. Eisenstein, "Du cinema en relief," 108-109.
34. Eisenstein apparently drew his Siam reference from the experience of the governess Ann Leonowens (mistakenly described as American, although she was in fact Anglo-Indian) made famous by Margaret Landon's fictionalized account in *Anna and the King of Siam* (1944), the basis of the subsequent 1951 musical and later film.
35. Eisenstein, "Du cinema en relief," 147-148.
36. *Ibid.*, 148.
37. Contact with the West was severely reduced before and after World War Two, but the wartime alliance provided temporary access to many films and publications.
38. Eisenstein refers to Elmer Rice's 1945 play *Dream Girl*, which was not filmed until 1951 (by Mitchell Leisen).
39. Eisenstein, "Du cinema en relief," 152
40. *Ibid.*, 153. Aldous Huxley's novel, *Brave New World*, was published in 1932.
41. *Ibid.*, 157.
42. Eisenstein, "Stereoscopic Films," 136.
43. Ivor Montagu, "The Third Dimension – Film of the Future," in *The Cinema*, ed. Roger Manvell (London: Pelican, 1950), 132-139.
44. This is in fact what today's evening audiences at the Cannes Film Festival experience in the Palais des Festivals.
45. Wollen, "An Alphabet of Cinema," 17.
46. Four films were shown in London: the fourth being ROYAL RIVER, a travelogue of the Thames, and the first 3-D travelogue ever to be shot in color. See Raymond

Spottiswoode, "Progress in Three-Dimensional Films at the Festival of Britain," *Journal of the SMPTE* 52 (April 1952): 291-303, available at http://www.archive.org/stream/journalofsociety58socirich#page/n299/mode/2up. "As the Festival of Britain drew to a close, the four films continued to be shown in London together with newsreels. They were also distributed to other European capitals and to the United States. Given the unique requirements for stereoscopic projection, British advisors were dispatched abroad to provide guidance on running the projectors. Charles W. Smith was one such roving technician who went to Paris in 1952." Janet Leigh Foster, "A Three Dimensional Life: Charles W. Smith FBKS FRPS," *Journal of 3-D Imaging* 158 (October 2002). Available at http://www.stereoscopy.com/3dlegends/charlessmith.html. An additional short report in *Radio, Cinéma, Télévision* lists a fifth film shown in Paris, THE BLACK SWAN, a ballet film "which demonstrates the most effective possible use of depth of field at the service of narrative." André Bazin, *Radio, Cinéma, Télévision* no. 131 (20 July 1952): 5.

47. Bazin, "Un nouveau stade," 5.
48. On Wyler in *La Revue du cinema* nos. 10 and 11 (1948); and in *Cahiers du cinéma* no. 1 (1951). These are before the more familiar articles from 1950-1955, composited by Hugh Gray as "The Evolution of the Language of Cinema" in *What Is Cinema?* vol. 1, 23-40. What emerges from this chronological reading of texts from 1948-1952 is a ferment of excitement, in which exaggerated "depth" effects in 2D cinema are discovered, by separate commentators, to anticipate stereoscopic 3D experiments.
49. Bazin, "Un nouveau stade," 5.
50. *Ibid.*
51. André Bazin, "La revolution par le relief n'a pas eu lieu," *Radio, Cinéma, Télévision* 324 (1 April 1956). The title alludes to Jean Giroudoux's 1935 play, *La guerre de Troie n'aura pas lieu* [The Trojan War Will Not Happen], 4.
52. *Ibid.*, 5.
53. *Ibid.*
54. *Ibid.*
55. *Ibid.*
56. Peter Wollen, "Cinema and Technology: A Historical Overview," in *The Cinematic Apparatus*, ed. Teresa de Lauretis and Stephen Heath (London: Macmillan, 1978), 19.
57. *Ibid.* [my italics].
58. Eisenstein noted the importance of stereo sound to accompany stereo film in his 1947 essay, and recalled how he had wanted to add rear speakers at the Bolshoi Theatre for the Ride of the Valkyries in his 1938 production of *Die Walküre*.
59. Terry Ramsaye's, *A Million and One Nights: A History of the Motion Picture through 1925* (New York: Simon & Schuster, 1926), 69. Ramsay's history was heavily influenced, and endorsed, by Edison, and includes many claims about the dating of his and Dickson's early moving picture work which have since been questioned.
60. Louis Lumière, "Stereoscopy on the Screen," *Society for Motion Picture Engineers Journal* 27 (September 1936): 315; "Colored screen for stereoscopic projections," United States Patent 2136303, 1938.

61. Presentations of Lumière 3D films by Thierry Fremaux in Paris, at the Europa Cinema Conference in November 2010, and in Bologna, at Il Cinema Ritrovato in 2010.
62. In a speech to the Technical Branch of the Academy of Motion Picture Arts and Sciences in Los Angeles on September 17, 1930. This was subsequently printed as "The Dynamic Square" in *Close Up* in 1931, and appears in Jay Leyda, ed., *Film Essays and a Lecture* (London: Dobson, 1968); also in Richard Taylor, ed., *Eisenstein: Writings, 1922-1934* (London: British Film Institute, 1988).
63. Eisenstein, "The Dynamic Square," in Taylor, *Eisenstein: Writings*, 215.
64. *Ibid.*, 216.
65. See Richard Collins and Ian Christie, "Interview with Michael Powell," *Monogram* no. 3 (1972): 37.
66. *Ibid.*
67. See Philippe Dubois, "Présentation," in *Oui, c'est du cinema/Yes, It's Cinema* (Pasian di Prato: Campanotto Editore, 2009), 7.
68. Charles Wheatcroft, "Contributions to the Physiology of Vision – Part the First. On Some Remarkable, and Hitherto Unobserved, Phenomena of Binocular Vision," June 21, 1838, available at http://www.stereoscopy.com/library/wheatstone-paper1838.html. Stereo derives from the Greek word στερεός, meaning "solid."
69. A physician, poet and journalist, Holmes (1809-1894) did not patent his stereoscope, enabling many different producers to enter the market with viewers and sets of stereographic cards.
70. Oliver Wendell Holmes, "The Stereoscope and the Stereograph," *The Atlantic*, June 1959, available at http://www.theatlantic.com/magazine/archive/1859/06/the-stereoscope-and-the-stereograph/303361/.
71. Workable stereo projection solutions were proposed by Duboscq, D'Almeida and Pepper, but none was ever widely adopted. See "Stereoscopic Projection," in *Encyclopedia of the Magic Lantern* (Ripon, Yorkshire: Magic Lantern Society, 2001), 293-294.
72. Erkki Huhtamo, "Towards a History of Peep Practice," in *A Companion to Early Cinema*, ed. André Gaudreault et al. (Chichester: Wiley, 2012), 42.
73. David Brewster, *The Stereoscope: Its History, Theory and Construction* (London: John Murray, 1856), 163.
74. Earlier Phonograph parlors, together with automated peepshows such as Alois Polanecky's Glas-Stereogram-Salon and August Fuhrmann's Kaiser-Panorama, served as models for the exhibition of the earliest moving-pictures entertainment machines, Edison's Kinetoscope and the rival Mutoscope. See Huhtamo, "Towards a History of Peep Practice," 43-44.
75. See E. Thomson, "Stereoscopic Roentgen Pictures," *The Electrical Engineer*, March 1896, and many articles by this American X-ray pioneer. See also R. Van Tiggelen, "In Search for the Third Dimension: From Radiostereoscopy to Three-Dimensional imaging," *Belgian Journal of Radiology* 85 (2002): 266-270, available at http://www.radiology-museum.be/Pdf/article_0081.pdf.
76. Van Tiggelen, "In Search for the Third Dimension," 270. See also, Marco Agus et al., "Medical Visualization with New Generation Spatial 3D Displays," presented at the

Eurographics Italian Chapter Conference (2007), accessed at http://www.researchgate.net/publication/221210439_Medical_Visualization_with_New_Generation_Spatial_3D_Displays; and Kyoung Won Nam, et al., "Application of Stereo-Imaging Technology to Medical Field," *Health Inform Res* 18, no. 3 (September 2012): 158–163, available at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3483472/.

77. Industrial Electronic Engineers Inc., available at http://www.ieeinc.com/news/iee-develops-3d-display-handheld-military-applications.
78. Details of this, and its 1940 successor, made in Technicolor, *New Dimensions*, can be found at http://www.rokemneedlearts.com/carsindepth/wordpressblog/?p=8345. On the View-Master, see the Wikipedia entry and its sources, including an essay on the design appeal of the device by Jonathan Glancey, at http://www.theguardian.com/artanddesign/2008/jul/31/viewmaster.design.classic.
79. This claim was made by the project's technical director, Raymond Spottiswoode. Spottiswoode, "Progress in Three-Dimensional Films at the Festival of Britain," 292, available at http://archive.org/stream/journalofsociety58socirich#page/n301/mode/2up/search/spottiswoode.
80. This short film, produced by George Lucas and starring Michael Jackson (and edited by the noted 3D skeptic Walter Murch), offered many Disney parks customers their first encounter with projected 3D, until it was withdrawn due to scandals surrounding Jackson.
81. See Ray Zone, *3D Revolution: The Story of Modern Stereoscopic Cinema* (Lexington: University Press of Kentucky, 2012), 160. According to Suzanne Lloyd Hayes, in addition to her grandfather, who took thousands of 3D slides, fellow-members of the Hollywood Stereoscopic Society in the 1940s included Dick Powell, Art Linklater and Ronald Colman (Lloyd Hayes, *3-D Hollywood: Photographs by Harold Lloyd* [New York: Simon & Schuster, 1992], 10).
82. The artist Zoe Beloff has used the Bolex 16mm system for a series of films, including SHADOW LAND (2000), CHARMING AUGUSTINE (2005) and THE SOMNAMBULISTS (2008), influenced by "media archaeology." See a 2011 interview with her by Jussi Parikka: "'With Each Project I Find Myself Reimagining What Cinema Might Be': An Interview with Zoe Beloff," *Electronic Book Review*, October 24, 2011, accessed at http://www.electronicbookreview.com/thread/imagenarrative/numerous.
83. An announcement that the BBC was discontinuing the 3D service started in 2011 was made in July 2013, citing "disappointing" viewing figures. Iain Thomson, "BBC Abandons 3D TV, Cites 'Disappointing' Results," *The Register*, July 5, 2013, available at http://www.theregister.co.uk/2013/07/05/bbc_cuts_3d_tv_service/.
84. On 20 July 2013, the pioneer German techno band Kraftwerk played at Latitude in Norfolk, accompanied by 3D visuals that required the audience to wear glasses. See "Latitude Festival 2013: Kraftwerk Intrigue with Imaginative 3D Set," *Metro*, July 21, 2013, available at http://metro.co.uk/2013/07/21/latitude-festival-2013-kraftwerk-intrigue-with-imaginative-3d-set-3891558/.
85. Despite this widely voiced view, the box-office data for 3D releases, and the releases planned up to five years ahead, indicate that these are still extremely profitable. See the chart at IMDb's Box Office Mojo, available at http://boxofficemojo.com/genres/chart/?view=main&id=3d.htm&p=.htm.

86. Brian Winston, *Technologies of Seeing: Photography, Cinema and Television* (London: British Film Institute, 1996), 109-118.
87. *Ibid.*, 4-6, 117.
88. *Ibid.*, 109.
89. For instance, SETRED's "Clariti Display and Samurai-3D Medical Imaging Software enable[s] surgeons, radiologists and other medical professionals to view more patient image information at one time than ever before to potentially save time, reduce errors and improve certainty of surgical interventions" ("Clariti: Holographic 3D Visualisation Technology for Medical Applications," brochure, available at http://www.setred.com/setred_clariti.pdf).
90. On the Hewlett-Packard research, see: Damien Gayle, "Get Ready for the iPhone 3D: Radical New Smartphone Display Can Show Three Dimensional Images without Special Glasses," available at http://www.dailymail.co.uk/sciencetech/article-2296463/Revolutionary-3D-display-unveiled-today-used-smartphones-years.html#ixzz2cJjB07hc. On Neil Dodgson's work at the Cambridge University Computing Laboratory on autostereoscopic displays, see http://www.cl.cam.ac.uk/research/rainbow/research/autostereo.html.
91. On the specific challenges of 3D aesthetics, see Barbara Flueckiger's illuminating article, "Aesthetics of Stereoscopic Cinema," *Projections* 6, no. 1 (Summer 2012).
92. On the concept of how films build "worlds" for spectators, see Dan Yacavone, "Toward a Theory of Film Worlds," *Film-Philosophy* 12, no. 2 (September 2008): 83-108.
93. See the review of How the West Was Won by Dave Kehr: "How the West Was Won," *New York Times*, September 8, 2008, available at http://www.nytimes.com/2008/09/09/movies/homevideo/09dvds.html.
94. Richard III has been restored with a 4k scan of original elements and published by Criterion.
95. Comments by Jerzy Hoffman on making his film The Battle of Warsaw 1920 (2011) in 3D, in an interview with Konrad J. Zarębski: "*Battle of Warsaw 1920*: Interview with Director Jerzy Hoffman," *Culture.pl*, July 2011, available at http://www.culture.pl/web/english/resources-film-full-page/-/eo_event_asset_publisher/eAN5/content/battle-of-warsaw-1920-interview-with-director-jerzy-hoffman.
96. Some 6% of total film viewings in the UK took place in cinemas, according to research conducted by Ipsos-MORI for the Northern Alliance and Ipsos MediaCT study *Opening Our Eyes*.
97. Elsaesser, "The 'Return' of 3-D," 221.
98. See Leon Gurevitch's "research provocation," "Virtual Finally Reality? The Media Archaeologies of Immersive 3D and the Oculus Rift," *Stereoscopic Media*, August 19, 2013, accessed at http://www.stereoscopicmedia.org/?p=395.

Television's Many Technologies: Domesticity, Governmentality, Genealogy

1. I wish to thank Ian Christie, Annie van den Oever, Viola ten Hoorn and Florian Duijsens for their feedback and editorial support while writing this article.

2. In recent years, production studies not only paid more attention to technology but also showed that inside television production an intense and partly sophisticated reflection on technology always was in existence.
3. Lorenz Engell, "Tasten, Wählen, Denken. Genese und Funktion einer philosophischen Apparatur," in *Medienphilosophie. Beiträge zur Klärung eines Begriffs*, ed. Stefan Münker, Alexander Roesler and Mike Sandbothe (Frankfurt a.M.: Fischer, 2003), 54f.
4. Evgeny Morozov, *To Save Everything, Click Here: The Folly of Technological Solutionism* (New York: PublicAffairs, 2013), 24.
5. Marshall McLuhan, *Understanding Media: The Extensions of Man* (Cambridge, MA: MIT Press, 1994).
6. Josh Shepperd, "Medien Miss-verstehen. Marshall McLuhan und die National Association of Educational Broadcasters, 1958-1960," *Zeitschrift für Medienwissenschaft* 5 (2011): 25-43.
7. Even if his influence is obvious in prominent books such as: Neil Postman, *Amusing Ourselves to Death* (London: Penguin Books, 1986).
8. Raymond Williams, *Television: Technology and Cultural Form* [1973] (London & New York: Routledge, 1990).
9. See also: Hans Magnus Enzensberger, "Constituents of a Theory of the Media," in *The New Media Reader*, ed. Noah Wardrip-Fruin and Nick Montfort (Cambridge, MA: MIT Press, 2002), 261-275.
10. John Durham Peters, "Two Cheers for Technological Determinism" (presented at the "Media Histories" Conference, New York, 2011), available at http://vimeo.com/25591045.
11. Friedrich Kittler, *Optical Media: Berlin Lectures, 1999* (Cambridge: Polity, 2010), 207-224.
12. McLuhan, *Understanding Media*, 33.
13. *Ibid.*, 313.
14. Theodor W. Adorno, "Prologue to Television," in *Critical Models: Interventions and Catchwords* (New York: Columbia University Press, 2005), 53.
15. David Morley, "Television: Not so Much a Visual Medium, More a Visual Object," in *Visual Culture*, ed. Chris Jenks (London & New York: Routledge, 1995), 176.
16. Roger Silverstone, "From Audiences to Consumers: The Household and the Consumption of Communication and Information Technologies," in *The Audience and Its Landscape*, ed. James Hay, Lawrence Grossberg and Ellen Wartella (Oxford & Boulder: Westview, 1997), 285.
17. Williams, *Television*, 114.
18. *Ibid.*, 105.
19. *Ibid.*, 113.
20. *Ibid.*, 114.
21. David Morley and Roger Silverstone, "Domestic Communication – Technologies and Meanings," *Media, Culture and Society* 12 (1990): 35.
22. For instance: Hermann Bausinger, "Media, Technology and Daily Life," *Media, Culture and Society* 6 (1984): 343-351.

23. Tania Modleski, "The Rhythms of Reception: Daytime Television and Women's Work," in *Regarding Television: Critical Approaches – An Anthology*, ed. E. Ann Kaplan (Los Angeles: American Film Institute, 1983), 67.
24. Teresa de Lauretis, *Technologies of Gender: Essays on Theory, Film and Fiction* (Bloomington & Indianapolis: Indiana University Press, 1987).
25. Arjun Appadurai, *Modernity at Large: Cultural Dimensions of Globalization* (Minneapolis: University of Minnesota Press, 1996), 33.
26. David Morley and Kevin Robins, *Spaces of Identity: Global Media, Electronic Landscapes and Cultural Boundaries* (London & New York: Routledge, 1995).
27. Amanda D. Lotz, ed., *Beyond Prime Time: Television Programming in the Post-Network Era* (New York: Routledge, 2009); Michael Curtin, "Matrix Media," in *Television Studies after TV: Understanding Television in the Post-Broadcast Era*, ed. Graeme Turner and Jinna Tay (London: Routledge, 2009), 9-19.
28. Bausinger, "Media, Technology and Daily Life," 346.
29. Thomas Elsaesser, "The New Film History as Media Archaeology," *Cinémas* 14, no. 2 (2004): 78.
30. John Corner, *Critical Ideas in Television Studies* (Oxford: Clarendon Press, 1999), 5.
31. Jostein Gripsrud, "Broadcast Television: The Chances of Its Survival in a Digital Age," in *Television after TV: Essays on a Medium in Transition*, ed. Lynn Spigel and Jan Olsson (Durham, NC: Duke University Press, 2004), 210-223.
32. John T. Caldwell, *Televisuality: Style, Crisis and Authority in American Television* (New Brunswick, NJ: Rutgers University Press, 1995).
33. *Ibid.*, 73f.
34. *Ibid.*, 9.
35. John T. Caldwell, "Second-Shift Media Aesthetics: Programming, Interactivity, and User Flows," in *New Media: Theories and Practices of Digitextuality*, ed. Anna Everett and John T. Caldwell (London & New York: Routledge, 2003), 136.
36. E.g., David Beer, "Power through the Algorithm? Participatory Web Cultures and the Technological Unconscious," *New Media & Society* 11, no. 6 (2009): 985-1002; Alexander R. Galloway, *Protocol: How Control Exists after Decentralization* (Cambridge, MA: MIT Press, 2004); Richard Rogers, *Digital Methods* (Cambridge, MA: MIT Press, 2013).
37. Bruno Latour, "Technology Is Society Made Durable," in *A Sociology of Monsters: Essays on Power, Technology and Domination*, ed. John Law (London & New York: Routledge, 1991), 103-131.
38. More recently, more explicit connections between television research and actor-network theory have been made. For the example of the remote control see Mike Michael, *Reconnecting Culture, Technology and Nature* (London & New York: Routledge, 2000), and for a production studies-oriented approach see: John T. Caldwell, *Production Culture: Industrial Reflexivity and Critical Practice in Film and Television* (Durham, NC: Duke University Press, 2008); Jan Teurlings, "Unblackboxing Production: What Media Studies Can Learn from Actor-Network Theory," in *After the Break: Television Theory Today*, ed. Jan Teurlings and Marijke de Valck (Amsterdam: Amsterdam University Press, 2013), 101-116.

39. For a systematic comparison of the concepts, see Simon Ganahl, "Ist Foucaults 'dispositif' ein Akteur-Netzwerk?," *Foucault-Blog – UZH – Forschungsstelle Für Sozial- Und Wirtschaftsgeschichte*, April 1, 2013, available at http://www.fsw.uzh.ch/foucault-blog/blog/9/ist-foucaults-dispositif-ein-akteur-netzwerk.
40. In France, where the term is very much an everyday word, television in the 1920s and 1930s was already being described as a dispositif. See for instance the literature referenced in R.W. Burns, *Television: An International History of the Formative Years* (London: IET, 1998), 142-182. The term is still used in French television research: cf. Frank Kessler, "Notes on Dispositif," 2006, available at http://www.let.uu.nl/~Frank.Kessler/personal/notes%20on%20dispositif.PDF. In Germany, the domestic setting of television is amongst others described as a dispositif by Monika Elsner, Thomas Müller, and Peter M. Spangenberg, "Zur Entstehungsgeschichte des Dispositivs Fernsehen in der Bundesrepublik Deutschland der Fünfziger Jahre," in *Institution, Technik und Programm. Rahmenaspekte der Programmgeschichte des Fernsehens*, ed. Knut Hickethier (München: Fink, 1993), 31-66; Knut Hickethier, "Dispositiv Fernsehen. Skizze eines Modells," *Montage/AV* 4 (1995): 63-83.
41. I am here mainly referring to the discussion of the concept in the 1970s and 80s in texts by Jean-Louis Baudry, Jean-Louis Comolli, Stephen Heath and others. Christian Metz's somewhat different conceptualization of the cinematic dispositif also points out the inevitable embedding of the spectator through the technology setup: "the spectator can do no other than identify with the camera" (Christian Metz, *The Imaginary Signifier: Psychoanalysis and the Cinema* [Bloomington: Indiana University Press, 1982], 49). Later on, the concept was also used to distinguish between historically different constellations of cinema – e.g., the early "cinema of attractions" (Frank Kessler, "The Cinema of Attractions as Dispositif," in *The Cinema of Attractions Reloaded*, ed. Wanda Strauven [Amsterdam: Amsterdam University Press, 2006], 57-69).
42. In Baudry's first text on the issue, the term dispositif (in French: "dispositif particulier") is used when describing the film audience as being captured or captivated and comparing this to the suspension of mobility in Plato's cave (Jean-Louis Baudry, "Cinéma: Effets Idéologiques Produits par l'Appareil de Base," *Cinéthique* [1970]: 6).
43. John Ellis, *Visible Fictions: Cinema – Television – Video*, rev. ed. (London & New York: Routledge, 1992).
44. Michel Foucault, *Power/Knowledge: Selected Interviews and Other Writings, 1972-1977*, ed. Colin Gordon (New York: Pantheon, 1980), 194.
45. In *Discipline and Punish*, Foucault describes the panopticon as creating a topology which allows the application of discourses, classifications and hierarchies (it thus does not work purely architecturally or materially). The constant criticism and transformation of the system very much contributed to its functioning (Foucault, *Discipline and Punish: The Birth of the Prison* [New York: Penguin Books, 1991], especially Part 4). Additionally, in his *History of Sexuality* he shows how individualizing practices and strategies of liberation are enabled by and support a dispositif, thereby not only questioning the dominant model of power as only being repressive but

also the too easy equation between practices and resistance (Foucault, *The History of Sexuality: An Introduction, Volume 1* [New York: Vintage Books, 1990]).

46. James Hay offers an insightful comparison between Foucault and Williams: James Hay, "Unaided Virtues: The (Neo-) Liberalization of the Domestic Space," *Television & New Media* 1 (2000): 53-73.
47. Matthias Thiele, "Vom Mediendispositiv zum medialen Kombinat aus Dispositiven," *kultuRRevolution* no. 55/56 (2009): 41-46.
48. Clive Barnett, "Culture, Government and Spatiality: Reassessing the 'Foucault Effect' in Cultural-Policy Studies," *International Journal of Cultural Studies* 2 (1999): 385.
49. Margaret Morse, "An Ontology of Everyday Distraction: The Freeway, the Mall, and Television," in *Logics of Television: Essays in Cultural Criticism*, ed. Patricia Mellencamp (Bloomington & Indianapolis: Indiana University Press, 1990), 51.
    Several technological aspects of television certainly have nevertheless been described in relation to the panopticon, which is also undergoing a comeback in more recent discussions on surveillance culture and social media. See Ien Ang, *Desperately Seeking the Audience* (London & New York: Routledge, 1991), and John Hartley, "Power Viewing: A Glance at Pervasion in the Postmodern Perplex," in *The Audience and Its Landscape*, ed. James Hay, Lawrence Grossberg and Ellen Wartella (Oxford & Boulder: Westview, 1997), 223. For a more recent discussion of the panopticon in relation to online surveillance, see e.g., Taina Bucher, "Want to Be on the Top? Algorithmic Power and the Threat of Invisibility on Facebook," *New Media & Society* 14, no. 7 (2012): 1164-1180, and Mark Andrejevic, "The Discipline of Watching: Detection, Risk, and Lateral Surveillance," *Critical Studies in Media Communication* 23, no. 5 (2006): 391-407.
50. As an example for film studies see: Lee Grieveson, "On Governmentality and Screens," *Screen* 50 (2009): 180-187.
51. Michel Foucault, *Security, Territory, Population: Lectures at the Collège de France, 1977-1978* (Houndmills: Palgrave, 2007), 21.
52. Here, Foucault also makes a helpful distinction between the "history of techniques" (for television those could be the television set, the remote control, a particular form of ratings, and so on) and the "history of technologies," that is, the "much more fuzzy history of the correlations and systems of the dominant feature," taking up, multiplying and redeploying the techniques (Foucault, *Security, Territory, Population*, 8f).
53. Jack Z. Bratich, "'Nothing Is Left Alone for Too Long': Reality Programming and Control Society Subjects," *Journal of Communication Inquiry* 30, no. 1 (2006): 65-83.
54. Laurie Ouellette and James Hay, "Makeover Television, Governmentality and the Good Citizen," *Continuum: Journal of Media & Cultural Studies* 22, no. 4 (2008): 473.
55. Anna McCarthy, *The Citizen Machine: Governing by Television in 1950s America* (New York: The New Press, 2010). For a similar perspective on the introduction of public service television in the United States, see Laurie Ouellette, *Viewers Like You? How Public TV Failed the People* (New York: Columbia University Press, 2002).
56. Markus Stauff, "The Governmentality of Media: Television as 'Problem' and 'Instrument,'" in *Media, Culture, and Mediality: New Insights into the Current State of Re-*

search, ed. Ludwig Jäger, Erika Linz, and Irmela Schneider (Bielefeld: Transcript, 2010), 263-281.

57. Hay, "Unaided Virtues."
58. Neither in Foucault, nor in most media research that goes by the name of media archaeology, is there a clear-cut distinction between archaeology and genealogy. In Foucault's writing, genealogy is introduced later and modifies his archaeological approach – on which it is still based. Nevertheless, I find the two terms useful to mark the difference television research might bring to the more general discussions on the history of media/technologies. While in some older texts, the archaeological approach sometimes is opposed to a conventional (non-Foucauldian) concept of a "genealogical chart" (e.g., Elsaesser, "The New Film History," 86), more recent texts tend toward underlining the interrelation between media archaeology and (Foucauldian) genealogy (e.g., Wanda Strauven, "Media Archaeology: Where Film History, Media Art, and New Media (Can) Meet," in *Preserving and Exhibiting Media Art: Challenges and Perspectives*, ed. Julia Noordegraaf et al. [Amsterdam: Amsterdam University Press, 2013], 59-80; see in particular p. 69).
59. Erkki Huhtamo and Jussi Parikka, eds, *Media Archaeology: Approaches, Applications, and Implications* (Berkeley: University of California Press, 2011), 2.
60. Michel Foucault, *Archaeology of Knowledge* (London: Routledge, 2002), 30. Foucault's archaeological approach also was one of the major inspirations for Kittler's concepts of "Aufschreibesysteme" [Discourse Networks] – he explicitly wanted to add technical media, hardware and software to Foucault's library – and book-based approach (see also the conversation with Geoffrey Winthrop-Young in this book); however, Kittler never intensively discussed the later work of Foucault and its two major concepts "genealogy" and "governmentality" – both of which, in my opinion, are more open and appropriate to include new media and their specific materialities.
61. Bernhard Siegert, "Cacography or Communication? Cultural Techniques in German Media Studies," *Grey Room* no. 29 (2007): 29.
62. Elsaesser, "The New Film History."
63. Lynn Spigel, *Make Room for TV: Television and the Family Ideal in Postwar America* (Chicago: University of Chicago Press, 1992); John Hartley, *Uses of Television* (London & New York: Routledge, 1999), 92-111.
64. Ang, *Desperately Seeking*; Eileen R. Meehan, "Why We Don't Count: The Commodity Audience," in *Logics of Television: Essays in Cultural Criticism*, ed. Patricia Mellencamp (Bloomington/Indianapolis: Indiana University Press, 1990), 117-137.
65. Ouellette, *Viewers Like You?*; McCarthy, *The Citizen Machine*; Hartley, "Power Viewing."
66. Max Dawson, "Home Video and the 'TV Problem': Cultural Critics and Technological Change," *Technology and Culture* 48, no. 3 (2007): 524-549.
67. Dawson and Spigel, "Television and Digital Media," 276.
68. Friedrich Kittler, *Gramophone, Film, Typewriter*, Writing Science (Stanford: Stanford University Press, 1999), 5.
69. Lynn Spigel, "Portable TV: Studies in Domestic Space Travels," in *Allegories of Communication: Intermedial Concerns from Cinema to the Digital*, ed. Jan Olsson and John Fullerton (Rome: John Libbey, 2004), 55-80; Max Dawson, "Defining Mobile Tele-

vision: The Social Construction and Deconstruction of New and Old Media," *Popular Communication* 10, no. 4 (2012): 253-268.

70. Hartmut Winkler, *Docuverse. Zur Medientheorie der Computer* (Regensburg: Boer, 1997), 55-64.
71. Lisa Parks, *Cultures in Orbit: Satellites and the Televisual* (Durham, NC: Duke University Press, 2005), 169.

Postmodern Hi-fi vs. Post-Cool Lo-fi: An Epistemological War

1. One can remember this artistic choice did not wait for the CGI revolution to arise: see battlefields staged by D.W. Griffith or C.B. DeMille in order to allow large-scale shots. Technologies of real crowds management or real pyrotechnics are still technologies.
2. On our polar type of encoding data, see Alain Berthoz, *The Brain's Sense of Movement: Perspectives in Cognitive Neuroscience* (Cambridge, MA: Harvard University Press, 2002), 99-100. On further links between this encoding and movies, see Laurent Jullier, "Should I See What I Believe? Audiovisual Ostranenie and Evolutionary-Cognitive Film Theory," in *Ostrannenie*, ed. Annie van den Oever (Amsterdam: Amsterdam University Press, 2010): 119-140.
3. This style defines itself by hand-held cameras making blurred pans. See David Bordwell, "Unsteadicam Chronicles," August 17, 2007, available at http://www.davidbordwell.net/blog/2007/08/17/unsteadicam-chronicles.
4. Svetlana Alpers, *The Art of Describing: Dutch Art in the Seventeenth Century* (Chicago: University of Chicago Press, 1983): 45, 69. Adjectives derive from German astronomer Johannes Kepler (1571-1630), inventor of a refracting telescope, and Italian humanist Leon Battista Alberti (1404-1472), whose treatise *Della pittura* describes perspective.
5. French philosopher Maurice Merleau-Ponty thought that the paintings of Paul Cezanne could achieve this way of representing things. These paintings of course do not display columns of numbers, nonetheless they stay far from photorealism.
6. The sound categories tend to be blurred too: for instance THX sound system replaces classical semantic boundaries between words, music and noise, by technical-physiological boundaries between low, medium and high frequencies.
7. Roger Odin, "Du spectateur fictionnalisant au nouveau spectateur: approche sémiopragmatique," *Iris* 8 (2nd semester 1988): 121-138.
8. P. Winkielman, N. Schwarz, T. Fazendeiro, and R. Reber, "The Hedonic Marking of Processing Fluency: Implications for Evaluative Judgment," in *The Psychology of Evaluation: Affective Processes in Cognition and Emotion*, ed. J. Musch and K.C. Klauer (Mahwah, NJ: Erlbaum, 2003): 190.
9. P. Winkielman, N. Schwarz, and A. Nowak, "Affect and Processing Dynamics: Perceptual Fluency Enhances Evaluations," in *Emotional Cognition: From Brain to Behaviour*, ed. S. Moore and M. Oaksford (Amsterdam: John Benjamins, 2002): 111.
10. Philippe Lejeune, *On Autobiography*, Vol. 52 of *Theory and History of Literature*, ed. and with a foreword by Paul John Eakin, trans. Katherine Leary (Minneapolis: Univer-

sity of Minnesota Press, 1989): 23 – I transpose to cinema an assertion made for literature (as with notes #15 to #19).

11. Available at http://www.imdb.com/title/tt1084950/reviews.
12. The "post-cool" label includes gore and so-called *gorno* movies. When interviewing gore fans and asking them how they could stay in front of the screen and deal with the disgusting horrors it displayed (I certainly could not), I expected to meet post-modern skeptical dandies, unable to be moved by what they ultimately knew to be pixels. But to my surprise I met people who on the contrary engaged themselves into the diegesis enough to feel shocked and turned down. They valued such a particular "technique of the body" (see this notion later in this essay) in order to know their own connections between flesh and mind better. In France they call themselves "viandards," a slang term for people who enjoy eating meat.
13. On this question, see (in French) Laurent Jullier, "Une rétro-ingénierie du regard. L'exemple des voyages de Scrooge," in *Cinématismes*, ed. J. Nacache and J.-L. Bourget (Berne: Peter Lang, 2012): 73-90.
14. Dorrit Cohn, *The Distinction of Fiction* (Baltimore: Johns Hopkins University Press, 1999): 30.
15. Käte Hamburger, *The Logic of Literature*, trans. Marilynn J. Rose, 2nd ed. (Bloomington: Indiana University Press, 1993): 313.
16. An autobiographical text establishes a pact that "supposes there is identity of name between the author, the narrator of the story and the character who is being talked about" (Philippe Lejeune, *On Autobiography*, 12).
17. Verna Kale, "'A Moveable Feast' or 'a Miserable Time Actually'? Ernest Hemingway, Kay Boyle, and Modernist Memoir," in *Ernest Hemingway and the Geography of Memory*, ed. M. Cirino and M.P. Ott (Kent, OH: Kent University Press, 2010): 131.
18. F. Scott Fitzgerald, *The Great Gatsby* (New York: Charles Scribner's Sons, 1925).
19. Ernest Hemingway, "Old Newsman Writes: A Letter from Cuba," in *By-Line Ernest Hemingway*, ed. W. White (New York: Charles Scribner's Sons, 1967): 184. Originally published in *Esquire* (December 1934).
20. Janet Staiger, *Perverse Spectators: The Practices of Film Reception* (New York: New York University Press, 2000).
21. Laurent Jullier and Jean-Marc Leveratto, "Cinephilia in the Digital Age," in *Audiences*, ed. Ian Christie (Amsterdam: Amsterdam University Press, 2012), 143-154.
22. Thomas Sotinel, "Le clinquant de *Gatsby* pour ouvrir le bal," *Le Monde*, May 13, 2013.
23. Fabrice Montebello, "Joseph Staline et Humphrey Bogart: l'hommage des ouvriers," *Politix* 24 (December 1993): 115-133.
24. John Dewey, *Art as Experience* [1934] (New York: The Berkeley Publishing Group, 2005), 3.
25. Herbert Blumer [Conclusion of] *Movies and Conduct* (New York: Macmillan & Company, 1933), 200, available at http://www.brocku.ca/MeadProject.
26. Marcel Mauss, *Techniques, Technologies and Civilisation* [1935] (New York & Oxford: Durkheim Press/Bergham Books, 2006), 80. For further inquiries, see Laurent Jullier, "Specificity," in *The Routledge Encyclopedia of Film Theory*, ed. W. Buckland and E. Branigan (New York: Routledge, 2013, in press).

27. Noël Carroll reaches the same conclusions (by using different paradigms) when he dismisses what he calls technological essentialism in his *Philosophy of Mass Art* (Oxford: Clarendon Press, 1998).

Marey's Gun: Apparatuses of Capture and the Operational Image

1. On the biopolitics-concept, see Michel Foucault, *The History of Sexuality, vol. 1: The Will to Knowledge*, trans. Robert Hurley (London: Penguin, 1998), 135-145.
2. Nadar [Félix Tournachon], "Le nouveau président de la Société Francaise de Photographie," *Paris-Photographe* 4 (1894): 4, quoted in Marta Braun, *Picturing Time: The Work of Etienne-Jules Marey (1830-1904)* (Chicago: University of Chicago Press, 1992), 5.
3. Étienne-Jules Marey, "Natural History of Organized Bodies," trans. C.A. Alexander, *Annual Report of the Board of Regents of the Smithsonian Institution for 1867* (Washington: Government Printing Office, 1868), 278-304.
4. Étienne-Jules Marey, *Animal Mechanism: A Treatise on Terrestrial and Aerial Locomotion*, 2nd ed. (New York: D. Appleton and Co., 1879), 4.
5. Braun, *Picturing Time*, 16.
6. *Ibid.*, 32-35.
7. Étienne-Jules Marey, "Le fusil photographique," *La Nature* (22 April 1882): 326-330.
8. Jules Janssen, "Présentation du revolver photographique et épreuves obtenues avec cet instrument," *BSFP* 22 (April 1876): 104, quoted in Braun, *Picturing Time*, 55.
9. On the latter, see Georges Didi-Huberman and Laurent Mannoni, *Mouvements de l'air: Etienne-Jules Marey, photographe des fluids* (Paris: Gallimard, 2004).
10. Braun, *Picturing Time*, 136.
11. Marey, *Animal Mechanism*, 27.
12. Roland Barthes, *Camera Lucida: Reflections on Photography*, trans. Richard Howard (New York: Hill and Wang, 1981).
13. Gilles Deleuze and Félix Guattari, *Mille plateaux: Capitalisme et schizophrénie 2* (Paris: Les Editions de Minuit, 1980), 545-560.
14. On Marey and Taylorism, see Braun, *Picturing Time*, 320-348.
15. Michel Foucault, "The Confessions of the Flesh," in *Power/Knowledge: Selected Interviews and Other Writings, 1972-77*, ed. Colin Gordon, trans. Colin Gordon et al. (New York: Pantheon Books, 1980), 194-228.
16. Foucault, "Confessions," 194.
17. Giorgio Agamben, "What Is an Apparatus?," in *What Is an Apparatus? and Other Essays*, trans. David Kishik and Stefan Pedatella (Stanford: Stanford University Press, 2009), 1-24, quotation on p. 14.
18. See Jean-Louis Baudry, "Le dispositif: Approches métapsychologiques de l'impression de réalité," *Communications* 23 (1975): 56-72. For a recent reinterpretation of the concept of *dispositif* in the context of the study of film history, see Frank Kessler, "The Cinema of Attractions as Dispositif," in *The Cinema of Attractions Reloaded*, ed. Wanda Strauven (Amsterdam: Amsterdam University Press, 2006), 57-69. Recently, François Albera and Maria Tortajada have developed the notion of "dispositive," inspired by Foucault's apparatus-concept, in relation to the analysis of view-

ing positions throughout the history of audiovisual media. Dispositive, for them, addresses the "epistemic schemas" that at given historical and technical arrangements determine the coming together of spectators, machinery and representations. See François Albera and Maria Tortajada, eds, *Cinema beyond Film: Media Epistemology in the Modern Era* (Amsterdam: Amsterdam University Press, 2010).

19. I discuss this mode of vision in more detail in *Mapping the Moving Image: Gesture, Thought and Cinema circa 1900* (Amsterdam: Amsterdam University Press, 2010).
20. See Harun Farocki, "Influences transversales," trans. Pierre Rusch, *Trafic* 43 (Autumn 2002): 19-24.

Re-editing as Psychotechnique: Montage and Mediality in Early Soviet Cinema

1. See Yuri Tsivian et al., eds, *Testimoni silenziosi: film russi 1908-1919/Silent Witnesses: Russian Films, 1908-1919* (Pordenone: Edizioni Biblioteca dell'Immagine, 1989).
2. An exception is Walter Benjamin, who mentions Vertov in his Moscow diary of 1927; see Walter Benjamin, "Moskauer Tagebuch," in *Gesammelte Schriften*, vol. 6 (Frankfurt a.M.: Suhrkamp, 1985), 292-409. An admirable overview of Vertov's activities in this time can be found in Yuri Tsivian, ed., *Lines of Resistance: Dziga Vertov and the Twenties* (Sacile: Giornate del Cinema Muto, 2004).
3. On Vertov's travels in Western Europe see Thomas Tode, "Un Soviétique escalade la Tour Eiffel: Dziga Vertov à Paris," *Cinémathèque* 5 (Spring 1994): 68–85, and Thomas Tode, "Ein Russe projiziert in die Planetariumskuppel. Dsiga Wertows Reise nach Deutschland 1929," in *Die ungewöhnlichen Abenteuer des Dr. Mabuse im Lande der Bolschewiki*, ed. Oksana Bulgakowa (Berlin: Freunde der Deutschen Kinemathek, 1995), 143–158.
4. Indeed, the recent fascination for Vertov – ranging all the way from Lev Manovich to John MacKay, from Jonathan Beller to Alexander Horwath – might have to do with how his modular-materialist concatenations can be mobilized as a prefiguration and illustration of the digital (or the post-Fordist).
5. See Malte Hagener, *Moving Forward, Looking Back: The European Avant-garde and the Invention of Film Culture, 1919-1939* (Amsterdam: Amsterdam: Amsterdam University Press, 2007), 171-175.
6. A good account of the re-editing practice for home distribution, but also for export is Yuri Tsivian, "The Wise and Wicked Game: Re-editing and Soviet Film Culture of the 1920s," *Film History* 8, no. 3 (1996): 327–343.
7. On this work see Jekatarina Chochlowa, "Die erste Filmarbeit Sergej Eisensteins. Die Ummontage des 'Dr. Mabuse, der Spieler' von Fritz Lang," in *Eisenstein und Deutschland. Texte – Dokumente – Briefe*, ed. Oksana Bulgakowa (Berlin: Akademie der Künste/Henschel, 1998), 115-122.
8. Tsivian, "The Wise and Wicked Game," 336.
9. For the FEKS-strategies borrowed from popular culture see Oksana Bulgakowa, "Das Phänomen FEKS: 'Boulevardisierung' der Avantgarde," *Montage/AV* 2, no. 1 (1993): 94–115. On FEKS in general see Ian Christie, and John Gillett, *Futurism/Formalism/FEKS: Eccentrism and Soviet Cinema, 1918-1936* (London: British Film Insti-

tute, 1978), Bernadette Poliwoda, *FEKS – Fabrik des exzentrischen Schauspielers. Vom Exzentrismus zur Poetik des Films in der frühen Sowjetkultur* (München: Verlag Otto Sagner, 1994), and Oksana Bulgakowa, *FEKS. Die Fabrik des exzentrischen Schauspielers* (Berlin: Potemkin Press, 1996).

10. For the significance of the music hall for Italian and Russian futurists as well as some relations between classical avant-garde and popular entertainment media see Wanda Strauven, "The Meaning of the Music-hall: From the Italian Futurism to the Soviet Avant-garde," *Cinéma & Cie* 4 (Spring 2004): 119-134.
11. See Annie van den Oever, ed., *Ostrannenie: On "Strangeness" and the Moving Image – The History, Reception, and Relevance of a Concept* (Amsterdam: Amsterdam University Press, 2010).
12. See Denise J. Youngblood, *Movies for the Masses: Popular Cinema and Soviet Society in the 1920s* (Cambridge: Cambridge University Press, 1993), and Ian Christie and Richard Taylor, eds, *Inside the Film Factory: New Approaches to Russian and Soviet Cinema* (London & New York: Routledge, 1991).
13. See for a wider contextualization David Bordwell, "The Idea of Montage in Soviet Art and Film," *Cinema Journal* 11, no. 2 (Spring 1972): 9-17.
14. Jay Leyda, *Kino: A History of the Russian and Soviet Film* (London: George Allen & Unwin, 1960), 175.
15. See the examples in Evgenij Margolit, "Der sowjetische Stummfilm und der frühe Tonfilm," in *Geschichte des sowjetischen und russischen Films*, ed. Christine Engel (Stuttgart & Weimar: Metzler, 1999), 17-67, here 23f.
16. A film like Vsevolod Pudovkin's MYEKHANIKA GOLOVNOGO MOZGA (MECHANICS OF THE BRAIN, 1926) could be seen as a perfect illustration of this intersection.
17. Vance Kepley, Jr., "Building a National Cinema: Soviet Film Education, 1918-1934," *Wide Angle* 9, no. 3 (1987): 14.
18. Mikhail Yampolski, "Reality at Second Hand," *Historical Journal of Film, Radio and Television* 11, no. 2 (1991): 161-171, here 165.
19. See David Bordwell on "techne-centred aesthetics" in his *The Cinema of Eisenstein* (Cambridge, MA: Harvard University Press, 1993), 35-39.
20. See Laura Vichi, *Henri Storck. De l'avant-garde au documentaire social* (Crisnée: Éditions Yellow Now, 2002), 23ff
21. See Günter Agde et al., eds, *Die rote Traumfabrik. Meschrabpom-Film und Prometheus (1921-1936)* (Berlin: Bertz + Fischer 2012).

Technophobia and Italian Film Theory in the Interwar Period

1. *Technophobia*, in *Collins English Dictionary* (London: Harper Collins, 2013), available at http://www.collinsdictionary.com/dictionary/english/technophobia?showCookiePolicy=true.
2. For a extensive account on this debate see Richard Abel, *French Film Theory and Criticism, 1907-1939* (Princeton: Princeton University Press, 1993).

3. For a general framing of these discussions, see Ian Christie and Richard Taylor, eds, *The Film Factory: Russian and Soviet Cinema in Documents, 1896-1939* (London & New York: Routledge, 1988).
4. For a detailed and seminal description of this process see Francesco Casetti, "Nascita della critica," in *Cinema italiano sotto il fascismo*, ed. Riccardo Redi (Padova: Marsilio, 1979), 145-164. See also Gian Piero Brunetta, *Intellettuali, cinema e propaganda tra le due guerre* (Bologna: Patròn, 1972); Gian Piero Brunetta, *Storia del cinema italiano, vol. 1. Il cinema muto: 1895-1929* (Rome: Editori Riuniti, 1993).
5. Some intellectuals explicitly asked for such a theoretical placement. See for instance Alberto Consiglio, "Per un'estetica del cinema," *L'Italia letteraria* 40 (4 October 1931): 5; "Per un'estetica del cinema [2]," *L'Italia letteraria* 41 (11 October 1931): 5; "Per un'estetica del cinema [3]," *L'Italia letteraria* 42 (18 October 1931): 5.
6. See Ruggero Eugeni, "Modelli teorici e critici (1924-1933)," in *Storia del cinema italiano. 1924-1933*, ed. Leonardo Quaresima (Venice: Marsilio, forthcoming), courtesy of the editor.
7. Besides the above mentioned contributions, consider also Fabio Andreazza, *Identificazione di un'arte. Scrittori e cinema nel primo Novecento italiano* (Rome: Bulzoni, 2008); *Bianco e nero* 550/551, special issue *Microteorie: Cinema muto italiano*, eds. Luca Mazzei and Leonardo Quaresima (2004-2005).
8. See the following contributions: James Hay, *Popular Film Culture in Fascist Italy* (Bloomington & Indianapolis: Indiana University Press, 1987); Jacqueline Reich and Piero Garofalo, eds, *Re-viewing Fascism: Italian Cinema, 1922-1943* (Bloomington: Indiana University Press, 2002); Vincenzo Buccheri, *Stile cines: studi sul cinema italiano 1930-1934* (Milan: Vita e Pensiero, 2004); Vito Zagarrio, *Cinema e fascismo. Film, modelli, immaginari* (Venice: Marsilio, 2004); Raffaele De Berti and Massimo Locatelli, eds, *Figure della modernità nel cinema italiano (1900-1940)* (Pisa: ETS, 2008).
9. See Harry Collins and Trevor Pinch, *The Golem: What Everyone Should Know about Science* (Cambridge: Cambridge University Press, 1993).
10. Bruno Latour, *Science in Action* (Cambridge, MA: Harvard University Press, 1987), 2.
11. Rick Altman, "La parola e il silenzio. Teoria e problem generali di storia della tecnica," in *Storia generale del cinema, Teorie, strumenti, memorie*, ed. Gian Piero Brunetta (Turin: Einaudi, 2001), vol. 5, 835 [my translation].
12. See Françoise Bastide, "Essai d'épistémologie à partir d'un texte technique sans prétention: une invention peu connue des frères Lumière," *Fundamenta scientiae* 2 (1985): 127-150.
13. Paolo Fabbri, "Introduzione," in *Una notte con Saturno. Scritti semiotici sul discorso scientifico*, Françoise Bastide, ed. Bruno Latour (Palermo: Meltemi, 2001), 9-23. Fabbri talks about the scientific text in these terms: "The text does not perform a prescribed code. Instead, one proceeds from the code (through dis-implication and re-figuration) to an underlying code's hypothesis. Reading does not happen by merely applying ready-made models, but requires the preliminary definition of an adequate co-text [...], i.e., a pertinent *corpus*" (12-13).
14. See Benedetto Croce, *Logica come scienza del concetto puro* (Bari: Laterza, 1909).
15. See Michel Foucault, *Dits et écrits*, vol. 2., ed. Daniel Defert and François Ewald (Paris: Gallimard, 1994), 54-55.

16. Pietro Rossi, "L'idealismo italiano," in *Storia della filosofia. Il Novecento*, ed. Pietro Rossi and Carlo A. Viano, vol. 1 (Rome & Bari: Laterza, 1999), 130, 132-133.
17. See Alessandra Tarquini, *Il Gentile dei fascisti. Gentiliani e antigentiliani nel regime fascista* (Bologna: Il Mulino, 2009); Alessandra Tarquini, *Storia della cultura fascista* (Bologna: Il Mulino, 2011).
18. See Gabriele Turi, *Lo stato educatore. Politica e intellettuali nell'Italia fascista* (Rome & Bari: Laterza, 2002).
19. See Luigi Freddi, *Il cinema. Il governo dell'immagine* (Rome: C.S.C./Gremese, 1994), 214.
20. See, for instance, Ernesto Cauda, *Il cinema a colori* (Rome: Bianco e nero, 1938); Libero Innamorati and Paolo Uccello, *La registrazione del suono* (Rome: Bianco e nero, 1938); or many contributions appearing in the journal related to Centro Sperimentale di Cinematografia, *Bianco e nero*, from 1937 on.
21. Giovanni Gentile, "Prefazione," in *Cinematografo*, ed. Luigi Chiarini (Rome: Cremonese, 1935), 4-5 [my italics and translation]. The influence of Gentile's philosophy over Chiarini's film theory is described in Ernesto G. Laura, "Luigi Chiarini e il film come assoluta forma," *Bianco e nero* 7-8 (July-August 1962): 18-66. See also Brunetta, *Intellettuali, cinema e propaganda tra le due guerre*.
22. See Altman, "La parola e il silenzio," 839-850. See also Altman's *Silent Film Sound* (New York: Columbia University Press, 2004), 15-23.
23. About this historical building process, see Silvio Alovisio and Luca Mazzei, "'The Star That Never Sets': The Historiographic Canonisation of Silent Italian Cinema," in *Il canone cinematografico/The Film Canon*, ed. Pietro Bianchi, Giulio Bursi and Simone Venturini (Udine: Forum, 2011), 393-404. Just as an example of historical perspective related to technological evolution and style, see Antonio Petrucci, "Cinematografia: dello stile," *Quadrivio* 1 (6 August 1933): 10.
24. For a very detailed and inspiring discussion of Italy's transition to sound, see: Paola Valentini, *Presenze sonore. Il passaggio al sonoro in Italia tra cinema e radio* (Florence: Le Lettere, 2007). For an account focused more specifically on technological issues, see Paola Valentini, "L'ambiente sonoro del film italiano degli anni Trenta. Tecnologia cinematografica e contaminazione del paesaggio mediale," in *Svolte tecnologiche nel cinema italiano. Sonoro e colore, Una felice relazione fratecnica ed estetica*, ed. Sandro Bernardi (Rome: Carocci, 2006), 27-48.
25. A. Nanni, *Tecnica e arte del film. Tra le quinte della cinematografia* (Milan: Vallardi, 1931), 142, 146 [my translation].
26. Besides the volume *40° anniversario della cinematografia (1895-1935)* (Rome: Sottosegretariato di Stato per la Stampa e la Propaganda, 1935), see: Elena Mosconi, "L'invenzione della tradizione. Le celebrazioni per il quarantennale del cinema," in *L'invenzione del film* (Milan: Vita e Pensiero, 2006), 209-226; Luca Mazzei, "Luigi Chiarini alla Mostra e il primato morale, civile e cinematografico degli italiani," *Bianco e nero* 562 (January-April 2009): 9-23.
27. See Alberto Friedemann, "Appendice 1. Brevetti italiani di cinematografia Sonora concessi dal 1900 al 1934," in *Svolte tecnologiche nel cinema italiano*, 181-187; Federico Pierotti, "Appendice 2. Brevetti italiani di cinematografia a colori concessi dal 1930 al 1945," in *Svolte tecnologiche nel cinema italiano*, 188-191. The mentioned volume is

part of a book series, "Cinema/Tecnologia," presenting the results of state-funded research devoted to Italian film technology: "Cinema Technology, Technology in Cinema." Francesco Casetti coordinated the research in the years 2002-2004.

28. Silvio Alovisio, "Lo spoglio delle riviste del cinema muto italiano: il *corpus* e I primi risultati," in *Cinema muto italiano: tecnica e tecnologia. Discorsi, precetti, documenti*, ed. Michele Canosa, Giulia Carluccio and Federica Villa (Rome: Carocci, 2006), 49-57. This book also belongs to the above-mentioned series.
29. Alberto Cecchi, "Cinelandia – Il cantantepazzo," *L'Italialetteraria* 19 (19 May 1930): 5.
30. See, for instance, the brief marginal remarks in Alberto Cecchi, "Cinelandia-Femmine del mare," *L'Italia letteraria* 3 (19 January 1930): 5.
31. Alberto Cecchi, "Cinelandia-Notti di principi," *L'Italia letteraria* 11 (23 March 1930): 5.
32. Eugenio Giovannetti distinguished himself within the national debate for his interest in cinema as a medium itself, radically renewing the production of culture – this peculiar perspective was widely derived from Béla Balázs, whom not many Italian intellectuals knew in the late 1920s.
33. Eugenio Giovannetti, *Il cinema e le arti meccaniche* (Palermo: Sandròn, 1930), 14, 25. An insightful comment on Giovannetti to be found in Francesco Casetti, *Eye of the Century: Film, Experience, Modernity* (New York: Columbia University Press, 2008), 87.
34. Chiarini, *Cinematografo*, 81.
35. See, for instance, Rudolf Arnheim, "Nuovo Laocoonte," *Bianco e nero* 8 (1938): 3-33. Arnheim fled Nazi persecution and went into Italian exile, where he took part in a series of cultural activities concerning cinema. For his Italian activity see Rudolf Arnheim, *I baffi di Charlot. Scritti italiani sul cinema (1932-1938)*, ed. Adriano D'Aloia (Turin: Kaplan, 2009).
36. Luigi Pirandello, "Se il film parlante abolirà il teatro," *Il Corriere della Sera* (16 June 1929); now in Francesco Càllari, *Pirandello e il cinema: con una raccolta completa degli scritti teorici e creativi* (Venice: Marsilio, 1991), 120-125.
37. Anton Giulio Bragaglia, *Film sonoro* (Milan: Corbaccio, 1929), 54 [my translation].
38. See, for instance, Nanni, *Tecnica e arte del film*. Generally speaking, sound was often described as a three-dimensional perception, whereas the image was related to graphics and thus considered bi-dimensional. See Virgilio Lilli, "Problema dell'attor muto e dello spettatore sordo," *L'Italia letteraria* 2 (11 January 1931): 5.
39. Françoise Bastide, "Iconographie des textes scientifiques: principes d'analyse," *Culture technique* 14 (1985): 133-151.
40. One of the few exceptions is Ettore Maria Margadonna, *Cinema ieri e oggi* (Milan: Domus, 1932), which is widely and brightly illustrated. Margadonna, a very lively and eclectic intellectual, was well aware of the European debate, mostly German, and had a specific interest in the film industry itself. He took part in the contemporary theoretical debate by contributing to such highbrow journals such as *Comoedia*, *Il Convegno*, and *Cine-convegno*, but he was not exclusively interested in aesthetically legitimizing cinema. Consider the fact that his book was criticized in Italy as not adequately representing national needs and interests. See Ettore Maria Margadonna, *Letter to Enzo Ferrieri*, unpublished document (28 February 1933 [?]), "Enzo

Ferrieri Archive-Fondazione Arnoldo e Alberto Mondadori," courtesy of the foundation. Therein Margadonna expresses his sorrow for the attacks to his recent publication, and for the fact that *Il Corriere della Sera*'s film critic, Filippo Sacchi, complained about the lack of due attention to Italian cinema.

41. Enzo Ferrieri, *Il cinematografo come fatto estetico*, unpublished and undated lecture [presumably 1933], typescript with hand-made remarks, Class. 1.3, Fasc. 3, "Enzo Ferrieri Archive-Fondazione Arnoldo e Alberto Mondadori," courtesy of the foundation [my translation]. However, Ferrieri was perfectly aware of cinema- and media-induced transformations: as a commentator, as well as a state radio manager, he did not reject such media shifts.
42. For extensive and in-depth research on the topic see, at least: Mario Verdone, *Cinema e letteratura del futurismo* (Rovereto (TN): Manfrini, 1990); Giovanni Lista, *Cinema e letteratura del futurismo* (Milan: Skirà, 2001); Wanda Strauven, *Marinetti e il cinema: tra attrazione e sperimentazione* (Pasian di Prato (UD): Campanotto, 2006); Giovanni Lista, *Il cinema futurista* (Recco (GE): Le Mani, 2010).
43. See Leonardo Quaresima, "Cinéma, rationalisme, modernisation: de la Triennale de Milan à l'E42. Sur deux films de Piero Bottoni et Corrado D'Errico," in *Cinéma, architecture, dispositif*, ed. Elena Biserna and Precious Brown (Pasian di Prato (UD): Campanotto, 2011), 26-35.
44. Luca Mazzei, "Balletto meccanico. Le riviste Cines," *Bianco e nero* 553 (September-December 2005): 81-87.
45. See, for instance, Enzo Ferrieri, "Untitled lecture," unpublished and undated lecture [presumably 1933], typescript with hand-made remarks, Class. 1.3, Fasc. 3, "Enzo Ferrieri Archive-Fondazione Arnoldo e Alberto Mondadori," courtesy of the foundation [my translation].
46. *Ibid.*, 15 [my translation].
47. For Croce's legacy in the debates carried out in film journals, see Andreazza, *Identificazione di un'arte*, 146-152.
48. See Alberto Consiglio, *Introduzione a un'estetica del cinema e altri scritti* (Napels: Guida, 1932), 38. See also Enzo Ferrieri, "Cinema," *Cine-convegno* 1 (25 February 1933): 1-4.
49. Carlo Ludovico Ragghianti, "Cinematografo rigoroso," *Cine-convegno* 4 (25 June 1933): 69-92.
50. Alberto Consiglio, "Estetica generale ed estetica del cinema," *Cine-convegno* 6 (25 October 1933): 102-113. This theoretical controversy was expressly intended to defend idealistic tradition, as a private correspondence between Consiglio and *Il Convegno* and *Cine-convegno*'s head, Enzo Ferrieri, proves. Three letters from Consiglio to Ferrieri, dated September 2, September 29, and October 2, 1933 testify to this. See "Enzo Ferrieri Archive-Fondazione Arnoldo e Alberto Mondadori," courtesy of the foundation.
51. See, for instance, Giacomo Debenedetti, "Risorse del cinema (frammento di una conferenza)," *Il Convegno* 6 (25 June 1931): 321-337; now in Giacomo Debenedetti, *Al cinema*, ed. Lino Micciché (Venice: Marsilio, 1983), 23-42.
52. For instance, intellectuals around the film club that *Il Convegno* organized, were aware of the French debate and of the so-called first wave film productions, as the

documents related to the film club's activities show. See "Enzo Ferrieri Archive-Fondazione Arnoldo e Alberto Mondadori," courtesy of the foundation.

53. Bragaglia, *Film sonoro*, 18 [my translation].
54. *Ibid.*, 20 [my translation].
55. See, for instance, Enzo Ferrieri, "Il film di silhouettes," unpublished and undated lecture [presumably 1933], typescript with hand-made remarks, Class. 1.3, Fasc. 3, "Enzo Ferrieri Archive-Fondazione Arnoldo e Alberto Mondadori," courtesy of the foundation.
56. Ettore Maria Margadonna, "Felix, Mickey, Oswald and Co. (Cioè la cosa cinematografica vera e propria)," *Il Convegno* 3-4 (25 April 1930): 128-136 [my italics]. See also Alberto Cecchi, "Cinelandia-Cartoni animati," *L'Italia letteraria* 12 (30 March 1930): 5.
57. See Tom Gunning, "Moving away from the Index: Cinema and the Impression of Reality," in *Screen Dynamics: Mapping the Borders of Cinema*, ed. Gertrud Koch, Volker Pantenburg and Simon Rothöler (Vienna: Österreichisches Filmmuseum, 2012), 42-59.
58. See Ferrieri, "Il film di silhouettes."

Jean-Luc Godard's Histoire(s) du Cinéma: *Cogito Ergo Video*

1. Time indications are based on the Japanese edition of Godard's film (Imagica, 2001). This may vary slightly from other editions. For the Gaumont edition (2007), 21 or 22 seconds must be added to the time code indicated here.
2. Jean-Luc Godard and Youssef Ishaghpour, *Cinema: The Archaeology of Film and the Memory of a Century*, trans. John Howe (Oxford & New York: Berg, 2005), 36.
3. Ernst Lubitsch, 1942.
4. Cf. Jacques Aumont, *Amnésies. Fictions du cinéma d'après Jean-Luc Godard* (Paris: P.O.L., 1999), 241-242.
5. Élie Faure, *Fonction du cinéma* (Paris: Denoël-Gonthier, Médiations, 1953), 82.
6. "I like objects. In my editing room, there is a notice on the machines: 'Be gentle with us, we are not human beings'" (Jean-Luc Godard, "Editing, Loneliness and Liberty," comments made at a conference on April 26, 1989, available at http://www.directors.ocatch.com/s/Godard/conference_Godard.htm; French version in Godard, "Le montage, la solitude et la liberté," *Jean-Luc Godard par Jean-Luc Godard, Volume 2: 1984-1998*, ed. Alain Bergala [Paris: Cahiers du cinéma-éd. de l'Étoile, 1998], 243).
7. Béla Balázs, *L'Esprit du cinéma*, trans. J.M. Chavy (Paris: Payot, 1977), 234.
8. Chapter 1b, 0'13''.
9. Chapter 1a, 44'55''. Godard's voice is heard pronouncing those words in figure 2.
10. In "Hiroshima, notre amour," *Cahiers du cinéma* 97 (July 1959): 5.
11. 1b [10'11'', 25'14'', 28'03'', 29'05'', 30'02'']; 2b [9'22''- 9'53'', 10'36'', 23'08''].
12. Ernst Lubitsch, 1942.
13. Chapter 1b, 0'14''.
14. Robert Bresson, *Notes on Cinematography*, trans. Jonathan Griffin (New York: Urizen Books, 1977), 45.

15. *Ibid.*, 32.
16. *Ibid.*, 33.
17. *Ibid.*, 30.
18. *Ibid.*, 56.
19. Virgil's *Aeneid* quoted in the first shot of chapter 1a.
20. Robert Bresson, *Notes on Cinematography*, 50.
21. Chapter 3a, 23'37''- 25'50''.
22. Godard and Ishaghpour, *Cinema*, 31-32.
23. IT "information technology."
24. Godard and Ishaghpour, *Cinema*, 31-32.
25. *Ibid.*, 32-33.
26. Denis de Rougemont, *Penser avec les mains* (Paris: Albin Michel, 1936), 14, 146, 147, 163, 171.
27. In La Grande illusion (Renoir, 1937). Chapter 1a, 39'45''.
28. In Two Tickets to Broadway (James V. Kern, 1951).
29. Chapter 1a, 21'21''.
30. Chapter 1a, 23'34''; chapter 3b, 5'17''- 5'37''.
31. Chapter 3a, 6'49''- 6'54''.
32. Chapter 3a, 7'31''.
33. Vidor, 1932.
34. Chapter 1a, 13'44''- 15'40''.
35. Chapter 1a, 13'36''.
36. Chapter 1b, 28'3''.
37. Chapter 1b, 27'38''.
38. Chapter 1b, 30'2''- 31'30''.
39. Chapter 1b, 27'22''- 29'5''.
40. Godard, "Editing, Loneliness and Liberty"; in French: Godard, "Le montage, la solitude et la liberté," 242.

Performativity/Expressivity: The Mobile Micro Screen and Its Subject

1. Bruno Latour, *Pandora's Hope: Essays on the Reality of Science Studies* (Cambridge, MA: Harvard University Press, 1999), 306. About Latour's notion of inscription and his related concept of the immutable mobile in relation to digital cartography for mobile screens, see Sybille Lammes, "Destabilizing Playgrounds: Cartographical Interfaces, Mutability, Risk and Play," in *Playing the System: Subversion of Technoculture*, ed. Daniel Cermak-Sassenrath et al. (Heidelberg: Springer Verlag, 2014, forthcoming).
2. In line with this Latourian perspective and the so-called affordances approach to technology as developed by Donald Norman, we subscribe to the idea that not only do technologies shape our practices, but also practices inscribe technology (Donald Norman, *The Design of Everyday Things* [London: Basic Books, 1988]). As Larissa Hjorth has sketched out, Latour and Norman adhere to what can be called Social Construction of Technology (SCOT) perspective to technology, which include social constructivist and affordances approaches, of which the latter has

been widely picked up in work on human-computer interaction (HCI) and interaction design. Social constructivist approaches to mobile media include ethnographic studies to the use of digital and mobile media technologies. See Larissa Hjorth, "iPersonal: A Case Study of the Politics of the Personal," in *Studying Mobile Media: Cultural Technologies, Mobile Communication, and the iPhone*, ed. Larissa Hjorth, Jean Burgess and Ingrid Richardson (New York & London: Routledge, 2012), 190-212. See also: Ellen and Julia Lupton, "How Objects Explain Themselves," in *Design Your Life: The Pleasures and Perils of Everyday Things* (New York: St. Martin's Press, 2009), 73-79.

3. John L. Austin, *How to Do Things with Words: The William James Lectures Delivered at Harvard University in 1955*, ed. J.O. Urmson, 2nd ed. (Cambridge, MA: Harvard University Press, 1975); Mieke Bal, "Performance and Performativity," in *Traveling Concepts in the Humanities: A Rough Guide* (Toronto: University of Toronto Press, 2002), 147-212; Steve Dixon, *Digital Performance: A History of New Media in Theater, Dance, Performance, and Installation* (Cambridge, MA: MIT Press, 2007). Karen Barad proposes a "posthumanist performative approach" to thinking about the relations between technologies and practices in terms of intra-active becoming. The term "intra-active" makes the point that boundaries that demarcate bodies and things are always in process, that is, dynamic. "Agential Realism: How Material-Discursive Practices Matter," in *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* (Durham, NC: Duke University Press, 2007), 132-185.
4. Jean-Louis Baudry, "Le dispositif: approches métapsychologiques de l'impression de réalité," *Communications* 23 (1975): 56-72; "Ideological Effects of the Basic Cinematographic Apparatus" and "The Apparatus: Metapsychological Approaches to the Impression of Reality in the Cinema," in *Narrative, Apparatus, Ideology*, ed. Philip Rosen (New York: Columbia University Press, 1986), 286-318. See also Christian Metz, *The Imaginary Signifier: Psychoanalysis and the Cinema* (Bloomington: Indiana University Press, 1986). About the genealogy of the concept and its usefulness for film history, see Frank Kessler, "The Cinema of Attractions as Dispositif," in *The Cinema of Attractions Reloaded*, ed. Wanda Strauven (Amsterdam: Amsterdam University Press, 2006), 57-69. Giorgio Agamben has also famously addressed Foucault's notion of dispositif. "What Is an Apparatus?" in *What Is an Apparatus? and Other Essays*, trans. David Kishik and Stephen Pedatella (Stanford: Stanford University Press, 2009), 1-24.
5. About the (mobile) interface as effect, or a zone of practice, rather than strictly a technology, see Alexander Galloway, *The Interface Effect* (Cambridge & Malden, MA: Polity Press, 2012).
6. Brian X. Chen, *Always On: How the iPhone Unlocked the Anything–Anytime–Anywhere Future – and Locked Us In* (Philadelphia: De Capo Press, 2011), 147. Initially coined in 1990 by Boeing researcher Tom Caudell, the term described "a head-mounted digital display that guided workers through assembling electrical wires in aircraft" (148). The device aimed to augment, or engage, a person's perceptions through the intersection of virtual and physical realities by means of a layering or blending of digital visuals and the real world.

7. James Farman, *Mobile Interface Theory: Embodied Space and Locative Media* (London & New York: Routledge, 2012), 39. Lev Manovich has spoken of augmented space – a notion of enhancing "reality" by addition – while Adriana de Souza e Silva prefers to speak of hybridization – the integration of different registers of reality. While we appreciate the inherent conceptualization of relationships between different origins or materialities of data and the hierarchies that the name for the technology augmented reality invokes, we are specifically interested here in how spatial layering by location-aware technologies informs subjective positioning. See Lev Manovich, "The Poetics of Augmented Space," *Visual Communication* 5, no. 2 (2006): 219-240; Adriana De Souza e Silva, "From Cyber to Hybrid: Mobile Technologies as Interfaces of Hybrid Spaces," *Space and Culture* 9, no. 3 (2006): 261-278. About the operation of the mobile screens as a layered interface and the use of AR for archives and museums, see Nanna Verhoeff, *Mobile Screens: The Visual Regime of Navigation* (Amsterdam: Amsterdam University Press, 2012).
8. We remind our readers that Charles Sanders Peirce's triadic theory of the sign distinguishes between icon, index and symbol. For Peirce an icon is representational; it signifies by means of likeness or verisimilitude. In contrast, a symbol conforms to rules and conventions that establish the conditions that make signification possible: there is no "natural" or intuitive relation between, for example, a word and its referent. As for an index, it manifests meaning materially, either as a physical trace (a fingerprint or photograph) or a real-time indication of some event (the wind's direction or a finger's directional pointing). See Charles Sanders Peirce, *Peirce on Signs: Writings on Semiotic by Charles Sanders Peirce*, ed. James Hoopes (Chapel Hill: University of North Carolina Press, 1991); Charles Sanders Peirce, "Lecture Three: The Categories Defended," in *Pragmatism as a Principle and Method of Right Thinking: The 1903 Harvard Lectures on Pragmatism*, ed. Patricia Ann Turrisi (Albany: State University of New York Press, 1997), 167-188; Charles Sanders Peirce, *The Essential Peirce: Selected Philosophical Writings*, vol. 2, ed. Nathan Houser (Bloomington: Indiana University Press, 1998). See also: Cheryl Misak, ed., *The Cambridge Companion to Peirce* (Cambridge: Cambridge University Press, 2004); Cornelis de Waal, *Peirce: A Guide for the Perplexed* (London: Bloomsbury, 2013); Samuel Weber, *Institution and Interpretation* (Minneapolis: University of Minnesota Press, 1987).
9. Mary Ann Doane, "The Indexical and the Concept of Medium Specificity," *Differences: A Journal of Feminist Cultural Studies* 18, no. 1 (2007): 136. While often used in conjunction, indexicality and deixis have a different background, the first in philosophy and the latter in linguistics. About deixis, see Émile Benveniste, *Problems in General Linguistics* (Coral Gables, FL: University of Miami Press, 1971). For an overview of the ins and outs of deixis, see Stephen C. Levinson, "Deixis," in *The Handbook of Pragmatics*, ed. Laurence R. Horn (Oxford: Blackwell Publishing, 2004), 97-121. Levinson sees deixis as coextensive with indexicality, which he considers a larger category of contextual dependency and reserves deixis for linguistic aspects of indexicality (97-98).
10. For this principle we do not need a screen as such. For example, we contend that with the development of Google Glass, which is currently considered a very innovative technology for making the screen "disappear" into the frame of wearable

glasses, the principle of deixis remains the same. Directing one's gaze is the same as pointing, or holding up the screen in a certain direction.

11. Zoltán Dragon, "The Augmented Subject: Technological Interfaces of Subjectivity, Geography and the Moving Image," *Americana: E-Journal of American Studies in Hungary* 9, no. 1 (2013). Available at http://americanaejournal.hu/vol9no1/dragon. About performative cartography in AR and digital screen-based navigation, see Verhoeff, *Mobile Screens. From a critical geography perspective*, Jeremy Crampton has written about performativity in "Cartography: Performative, Participatory, Political," *Progress in Human Geography* 33 (2009): 840-848.
12. The photographic image as indexical trace has long interested film and media studies scholars – especially those whose object of study is documentary. Quintessential, in this regard, is Andre Bazin's claim that the photograph "embalms time." André Bazin, "The Ontology of the Photographic Image," *What Is Cinema?*, trans. Hugh Gray (Berkeley: University of California Press, 1968), 9-16. See also: Elizabeth Cowie, Recording Reality, *Desiring the Real* (Minneapolis: University of Minnesota Press, 2011); Bill Nichols, *Representing the Real: Issue and Concepts in Documentary* (Bloomington: Indiana University Press, 1991); Michael Renov, ed., *Theorizing Documentary* (New York: Routledge, 1993); Philip Rosen, *Change Mummified: Cinema, Historicity, Theory* (Minneapolis: University of Minnesota Press, 2001); Brian Winston, *Claiming the Real: The Documentary Film Revisited* (London: British Film Institute, 1999).
13. See Roland Barthes, *Camera Lucida: Reflections on Photography*, trans. Richard Howard (New York: Hill and Wang, 1981).
14. Heidi Rae Cooley has argued that the deictic gesture is also the site of another mode of expressivity. Expressivity, in this context, refers to the proliferation of texts, mobile-images, updates and posts, etc., all of which circulate streams of data providing a rhythmic (and potentially continuous) account of where a person is and what she is doing. These traces are evidence of every person's spontaneous relationship to her surroundings while having a smartphone, or similar mobile screenic device, in their hand. See Cooley, *Finding Augusta: Habits of Mobility and Governance in the Digital Era* (Hanover, NH: Dartmouth College Press, 2014, forthcoming).
15. Peter Morville, *Ambient Findability: What We Find Changes Who We Become* (Sebastopol, CA: O'Reilly Media, 2005), 9. The same principle informs how credit card companies detect instances of unusual spending and how AR applications know to populate a screen with information overlays appropriate to a particular spot. Important to make clear, however, is that those who are findable are not necessarily visible to those doing the finding, nor do they necessarily see themselves as potentially "found out" (e.g., in the sense of surveillance). Rather, the constant monitoring that makes AR technologies functional registers, or tracks, its participants. See Cooley, Finding Augusta.
16. And because the streams of information that the mobile subject disseminates are signs, they acquire meaning. In which case, findability is an interpretive process, in the Peircean sense, one that renders persons manageable. For more about the political implications of a culture of surveillance based on visibility and tracking based

on connectivity, see Cooley, *Finding Augusta*. It is worth noting other media theorists who consider the relation between [new media] technologies and governance. Addressing fiber optics and coding protocols, respectively, Wendy Chun and Alexander Galloway have focused on how computer technologies participate in relations of power. Lisa Parks has examined how satellite reconnaissance systems and global media platforms, such as Google Earth, articulate visual, military and corporate economies of power. Richard Grusin has discussed how post-9/11 media practices along with governmental techniques have served to manage, in anticipatory fashion, the "public's collective moods and perceptions" and Eugene Thacker has observed a turn to a logic of biodefense as a tactical response to risks (explicitly, bioterrorism and emerging infectious diseases, e.g., swine flu, avian flu and SARS) that have manifested as a consequence of transportation (e.g., air travel) and communications networks (e.g., postal systems). See Wendy Chun, *Control and Freedom: Power and Paranoia in the Age of Fiber Optics* (Cambridge, MA: MIT Press, 2006); Alexander R. Galloway, *Protocol: How Control Exists after Decentralization* (Cambridge, MA: MIT Press, 2004); Richard A. Grusin, *Premediation: Affect and Mediality after 9/11* (Basingstoke & New York: Palgrave Macmillan, 2010); Lisa Parks, "Zeroing In: Overhead Imagery, Infrastructure Ruins, and Datalands in Afghanistan and Iraq," in *Communication Matters: Materialist Approaches to Media, Mobility and Networks*, ed. Jeremy Packer and Stephen B. Crofts Wiley (London: Routledge, 2012); Eugene Thacker, "Nomos, Nosos and Bios," *Culture Machine* 7 (2005), available at http://www.culturemachine.net/index.php/cm/article/view/25/32.

17. The University of South Carolina is the site of one of the most intact "landscapes of slavery" in the United States. What is known today as the "historic Horseshoe" is situated at the heart of the modern campus and is what remains of the original South Carolina College (1801-1865) campus. *Ghosts* is based on the scholarship of nine graduate students enrolled in Robert Weyeneth's spring 2011 public history seminar. See: Allison Baker, Jennifer Betsworth, Rebecca Bush, Sarah Conlon, Evan Kutzler, Justin McIntyre, Elizabeth Oswald, Jamie Wilson and JoAnn Zeise, "Slavery at South Carolina College, 1801-1865: The Foundations of the University of South Carolina" (University of South Carolina, Spring 2011), available at http://library.sc.edu/digital/slaveryscc/index.html. The current design team for *Ghosts* includes Heidi Rae Cooley, Duncan Buell, Richard Walker, Amanda Noll, Celia Galens, Casey Cole and Ananda Frank. A prototype of the *Ghosts* application was presented and demonstrated on December 4, 2012 by undergraduate and graduate students enrolled in a cross-college course called "Critical Interactives." The project has received bridge funding (USC College of Arts and Sciences) and an internal ASPIRE II grant (USC Office of the VP for Research). The University Libraries hosts the server that houses the Ghosts database and website (http://calliope.tcl.sc.edu/). Please see the website to view a short video and a local WIS television segment about the project. See also: Heidi Rae Cooley and Duncan Buell, "Ghosts of the Horseshoe, a Mobile Application: Fostering a New Habit of Thinking about the History of University of South Carolina's Historic Horseshoe," in *Annual Review of Cultural Heritage Informatics* (forthcoming); Duncan Buell and Heidi Rae Cooley, "Critical Interactives: Improving Public Understanding of Institutional Policy," *Bulletin*

of Science, Technology & Society 32 [Special issue on video games] (December 2012): 489-496.

18. The work was commissioned to accompany the book project *Else/Where: Mapping New Cartographies of Networks and Territories*, ed. Janet Abrams and Peter Hall (Minneapolis: University of Minnesota Design Institute, 2006). In the collection, the artist writes about the experience of making the work in "Can't Be Elsewhere When GPS Drawing," (274-275).
19. Tim Ingold, "Against Space: Place, Movement, Knowledge," in *Being Alive: Essays on Movement, Knowledge and Description* (London & New York: Routledge, 2011), 148.

Rethinking the Materiality of Technical Media: Friedrich Kittler, *Enfant Terrible* with a Rejuvenating Effect on Parental Discipline – A Dialogue

1. Recently, he edited the special issue on cultural techniques for *Theory, Culture & Society* (with Ilinca Iurascu and Jussi Parikka), and translated an essay collection by Bernhard Siegert. See also: Geoffrey Winthrop-Young, "Hunting a Whale of a State: Kittler and his Terrorists," *Cultural Politics* 8, no. 3 (2012): 399-412.
2. As to the field of film studies more specifically: some recent publications provide introductions, overviews and analyses of the impact of media archaeology and Kittler's work on the fields of film studies, curating and archival practices, media art, etc. See for example, *Media Archaeology: Approaches, Applications, and Implications*, ed. Erkki Huhtamo and Jussi Parikka (Berkeley: University of California Press, 2012), and Wanda Strauven, "Media Archaeology: Where Film History, Media Art, and New Media (Can) Meet," in *Preserving and Exhibiting Media Art: Challenges and Perspectives*, ed. Julia Noordegraaf et al. (Amsterdam: Amsterdam University Press, 2013), 59-80.
3. Geoffrey Winthrop-Young, *Kittler and the Media* (Cambridge: Polity, 2011), 2.
4. For a more extensive personal account see Geoffrey Winthrop-Young, "'Well, What Socks Is Pynchon Wearing Today?' A Freiburg Scrapbook in Memory of Friedrich Kittler," *Cultural Politics* 8, no. 3 (2012): 361-373.
5. Further see Geoffrey Winthrop-Young, "Krautrock, Heidegger, Bogeyman: Kittler in the Anglosphere," *Thesis Eleven* 107, no. 1 (2011): 6-20.
6. Friedrich Kittler, *Discourse Networks 1800/1900*, trans. Michael Metteer and Chris Cullens, intr. David Wellbery (Stanford: Stanford University Press, 1990), 125.
7. Winthrop-Young, *Kittler and the Media*, 59 [my italics].
8. *Ibid.*, 58.
9. See Friedrich Kittler, "Ein Verwaiser," in *Anschlüsse: Versuche nach Michel Foucault*, ed. Gesa Dane et al. (Tübingen: Diskord, 1986), 141.
10. Michel Foucault, *The Order of Things: Archaeology of the Human Sciences* [1966] (London: Routledge, 2001).
11. E.g., Friedrich Kittler, "Heidegger und die Medien- und Technikgeschichte," in *Heidegger-Handbuch*, ed. D. Thomä (Stuttgart: Metzler, 2003), 500-504; and Kittler, "Zum Geleit," in *Der Foucault-Reader: Diskurs und Medien*, ed. J. Engelmann (Stuttgart: Deutsche Verlags-Anstalt, 1999), 7-9.

12. Friedrich Kittler, *Gramophone, Film, Typewriter*, trans. and intr. Geoffrey Winthrop-Young and Michael Wutz (Stanford: Stanford University Press, 1999), 4.
13. Winthrop-Young, *Kittler and the Media*, 59.
14. Arnheim quoted in Kittler, *Gramophone, Film, Typewriter*, 11-12.
15. Winthrop-Young, *Kittler and the Media*, 60.
16. Further see Eric Schatzberg, "*Technik* Comes to America: Changing Meanings of Technology before 1930," *Technology and Culture* 47, no. 3 (2006): 486-512.
17. Kittler, *Gramophone, Film, Typewriter*, xl.
18. Friedrich Kittler, *Optical Media*, trans. Anthony Enns (Cambridge: Polity, 2009).
19. See Frank Hartmann, "Vom Sündenfall der Software. Medientheorie mit Entlarvungsgestus: Friedrich Kittler," available at http://www.heise.de/tp/artikel/6/6345/1.html.
20. See the lecture online at http://www.egs.edu/faculty/friedrich-kittler/videos/the-relation-of-art-and-techne/.
21. Kittler, *Discourse Networks 1800/1900*.
22. See the dialogue on Christian Metz and apparatus theory in this book. Christian Metz, *The Imaginary Signifier: Psychoanalysis and the Cinema* (Bloomington: Indiana University Press, 1977).
23. Christian Metz, "La grande syntagmatique du film narratif," in *Essais sur la signification au cinema*, vol. 1 (Paris: Klincksieck, 1968).
24. These lectures are assembled and translated [by Anthony Enns] under the title *Optical Media*.
25. Viktor Shklovsky, "Art as Technique," in *Russian Formalist Criticism: Four Essays* [1917], trans. Lee T. Lemon and Marion J. Reis (Lincoln & London: University of Nebraska Press, 1965), 3-57.
26. Shklovsky, "Art as Technique," 12.
27. See Lambert Wiesing, "What Are Media?" in this book.
28. Friedrich Kittler, *Platz der Luftbrücke. Ein Gespräch mit Stefan Banz* (Nürnberg: Verlag für moderne Kunst, 2011). For the following see pp. 41-46.
29. Kittler, *Platz der Luftbrücke*, 44.
30. On this point further see Kittler, *Gramophone, Film, Typewriter*, 108; Geoffrey Winthrop-Young, "Drill and Distraction in the Yellow Submarine: The Dominance of War in Friedrich Kittler's Media Theory," *Critical Inquiry* 28, no. 4 (2002): 825-854; Vilém Flusser, *Towards a Philosophy of Photography* (London: Reaktion Books, 2000).
31. Kittler, *Gramophone, Film, Typewriter*, 2.

Revisiting Christian Metz's "Apparatus Theory" – A Dialogue

1. Martin Lefebvre and François Albera, eds. "La filmologie de nouveau," *Cinémas: Journal of Film Studies* 19, no. 2-3 (2009).
2. Dominique Chateau and Martin Lefebvre, "Dance and Fetish: Metz' Epistemological Shift," *October* (forthcoming). Parts of this article were presented as a paper in a panel on Christian Metz at the Film Philosophy Conference in London in September 2012.

3. Martin Lefebvre, "Existe-t-il une approche sémiologique de l'esthétique?" *1895*, no. 70 (forthcoming). Please note that all quotations from Metz's manuscript have been translated from the French by Martin Lefebvre, unless indicated otherwise.
4. "The semiological paradigm and Christian Metz's 'cinematographic' thought" [Le paradigme sémiologique et la pensée, 'cinématographique' de Christian Metz], (conference organized by the University of Zurich, Film Studies Department, 12-14 June, 2013).
5. Christian Metz, "Le cinéma: langue ou langage," *Communications* 4 (1964).
6. See online: http://www.reseau-cinema.ch/fileadmin/files/images/00_news/E-Flyer-DGZ.pdf.
7. [Eric de Kuyper and Emile Poppe, eds], *Seminar semiotiek van de film. Over Christian Metz. Sunschrift* 159 (Nijmegen: SUN, 1980). Sunschrift 158 was devoted to a partial translation in Dutch of Metz's *The Imaginary Signifier*. Moreover, many of Metz's articles were translated by and published in *Versus*, the academic film journal De Kuyper and Poppe founded and edited until late 1992. For an integral digital presentation, see http://filmarchief.ub.rug.nl/root/Sub-collecties/Papierenarchief/Filmtijdschriften/.
8. Christian Metz, "La grande syntagmatique du film narratif," in *Essais sur la signification au cinema*, vol. 1 (Paris: Klincksieck, 1968).
9. Christian Metz, *Le Signifiant imaginaire* (Paris: UGE, coll. 10/18, 1977), 12, 329n14.
10. Jean-Louis Baudry, *L'Effet cinéma* (Paris: Editions Albatros, coll. Ça cinéma, 1978).
11. Marcelin Pleynet, "Économique, idéologique, formel," *Cinéthique* no. 3 (1969): 10.
12. *Ibid.*
13. *ibid.*
14. Jean-Louis Baudry, "Effets idéologiques produits par l'appareil de base," *Cinéthique*, no. 7-8 (1970).
15. Jean-Louis Baudry, *L'Effet cinéma*, 31n1.
16. See Chateau and Lefebvre, "Dance and Fetish."
17. The text was originally published in *Cahiers du cinéma* and Metz refers to it in the opening pages of *Le Signifiant Imaginaire*/The Imaginary Signifier. Christian Metz, "A propos de l'impression de réalité au cinéma," *Cahiers du cinéma*, no. 166-167 (1965).
18. Laura Mulvey, "Visual Pleasure and Narrative Cinema," *Screen* 16, no. 3 (1975).
19. Christian Metz, "Vision binoculaire et vision monoculaire (idéologie et données psycho-physiologiques," (unpublished manuscript, Metz archive at Bibliothèque du film (BiFi), Paris, 1973-1974). Subsequent quotes are all taken from this manuscript.
20. Christian Metz, *The Imaginary Signifier: Psychoanalysis and the Cinema* [1977], trans. Celia Britton et al. (London: Macmillan, 1983), 74-76.
21. *Ibid.*
22. *Ibid.*
23. *Ibid.*
24. *Ibid.*
25. *Ibid.*
26. For a concise reflection on phenomenological media theories and Merleau-Ponty see Lambert Wiesing, "What Are Media?" in this book.

27. For the whole quote, see "What Are Media?" in this book.
28. Metz, *Le Signifiant imaginaire*, 75.
29. Christian Metz, "Existe-t-il une approche sémiologique de l'esthétique?" (unpublished manuscript of a conference paper, Metz archive at Bibliothèque du film (BiFi), Paris, 1971). The paper will be published in *1895*, no. 70 (forthcoming).
30. Christian Metz, "Trucages et cinéma," in *Essais sur la signification au cinéma*, vol. 2 (Paris: Klincksieck, 1972).
31. In a private email.
32. Christian Metz, (unpublished review, Metz archive at Bibliothèque du film (BiFi).
33. Christian Metz, from notes on Rudolf Arnheim's *Film as Art* (unpublished notes, Metz archive at Bibliothèque du film [BiFi], Paris).

The Future History of a Vanishing Medium

1. Notice: some footnotes are from the present (by the author of the text, André Gaudreault), others are supposedly from the future (by the avatar of the author of the text, Paul-Emmanuel Odin). This will be indicated by one of the two following tags: [Note by the author] and [Note by the avatar of the author].
2. [Note by the author] Only the first edition of this conference has taken place, in November 2011 at the Cinémathéque québécoise in Montreal, organized jointly by André Gaudreault (Université de Montréal) and Martin Lefebvre (Concordia University). See the conference report by Daniel Fairfax in *Cinema Journal* 52, no. 1 (Fall 2012): 127-131, available at http://muse.jhu.edu/login?auth=0&type=summary&url=/journals/cinema_journal/v052/52.1.fairfax.html.
3. [Note by the avatar of the author] Peter Bogdanovich and Orson Welles, *This Is Orson Welles*, ed. Jonathan Rosenbaum (New York: Da Capo, 1998), 23. It should be noted that Welles and Bogdanovich are not much fonder, it seems, of the expression "motion pictures" than they are of "cinema."
4. [Note by the author] *Ibid*. My thanks to Timothy Barnard for bringing this quotation to my attention.
5. [Note by the avatar of the author] William Paul, "Uncanny Theater: The Twin Inheritances of the Movies," *Paradoxa* 3, no. 3-4 (1997): 321-347.
6. Paul, "Uncanny Theater...," 231 [in note]. The "Announcement" was originally published in *The Moving Picture News*, September 27, 1913, vol. 8, 13, 15.
7. *Ibid*., "An Acknowledgment," originally published in *The Motion Picture News*, October 25, 1913, vol. 8, 16, 14.
8. [Note by the author] This quotation is in fact drawn from the present-day website: http://www.cmstudies.org/?page=org_history.
9. [Note by the author] *Ibid*.
10. [Note by the author] *Ibid*.
11. [Note by the avatar of the author] See in particular, as early as 1996, the title of two books by Noël Carroll: *Theorizing the Moving Image* (Cambridge: Cambridge University Press, 1996) and *Interpreting the Moving Image* (Cambridge: Cambridge University Press, 1998).

12. [Note by the avatar of the author] Robert Gessner, "Porter and the Creation of Cinematic Motion: An Analysis of 'The Life of an American Fireman,'" *The Journal of the Society of Cinematologists* 2 (1962): 1-13.
13. Marshall McLuhan, *Understanding Media: The Extensions of Man* (London & New York: McGraw-Hill, 1964).
14. [Note by the avatar of the author] Paolo Cherchi Usai, *The Death of Cinema: History, Cultural Memory, and the Digital Dark Age* (London: BFI, 2001).
15. [Note by the avatar of the author] "Où va le cinéma?" *Cinergon* 15 (2003).
16. [Note by the avatar of the author] David Norman Rodowick, *The Virtual Life of Film* (Cambridge, MA: Harvard University Press, 2007).
17. [Note by the avatar of the author] Alessandro Bordina, Philippe Dubois and Lucia Ramos Monteiros, eds, *Oui, c'est du cinéma: Formes et espaces de l'image en mouvement/ Yes, It's Cinema: Forms and Spaces of the Moving Image* (Pasian di Prato: Campanotto Editore, 2009).
18. [Note by the avatar of the author] Chuck Tryon, *Reinventing Cinema: Movies in the Age of Media Convergence* (New Brunswick, NJ: Rutgers University Press, 2009).
19. [Note by the avatar of the author] Dudley Andrew, *What Cinema Is!* (Malden: Wiley-Blackwell, 2010).
20. [Note by the avatar of the author] See André Gaudreault and Philippe Marion, *The Kinematic Turn: Film in the Digital Era and Its Ten Problems*, trans. Timothy Barnard (Montreal: Caboose, 2012). See also Gaudreault and Marion, "Measuring the 'Double Birth' Model against the Digital Age," *Early Popular Visual Culture* 11, no. 2 (May 2013).
21. [Note by the avatar of the author] Gene Youngblood, *Expanded Cinema* (New York: Dutton, 1970).
22. [Note by the avatar of the author] Philippe Dubois, Frédéric Monvoisin and Elena Biserna, eds, *Extended Cinema/Le cinéma gagne du terrain* (Pasian di Prato: Campanotto Editore, 2010).
23. [Note by the avatar of the author] *Ibid.*, back cover.
24. [Note by the avatar of the author] *Paris Match* 226 (18-25 July 1953).
25. [Note by the avatar of the author] All reference to the "Musée de l'image en mouvement" has now disappeared from the website of the Cinémathèque québécoise (http://www.cinematheque.qc.ca/fr). Until quite recently, one could find the following statement there: "Devoted to the past and headed for the future, the Cinémathèque québécoise is Montreal's museum of the moving image."
26. [Note by the author] Pierre Jutras, then program director and curator of international cinema, television and new media, in an email to the author on May 27, 2010.
27. [Note by the author] Yolande Racine, then executive director of the Cinémathèque québécoise, in an email to the author on October 15, 2010.
28. [Note by the author] Research group headed by Martin Lefebvre, Concordia University, Montreal. See: http://arthemis-cinema.ca/. [my italics].
29. [Note by the author] [my italics].
30. [Note by the avatar of the author] In particular Noël Carroll, Francesco Casetti, Dominique Chateau, Tom Gunning, Laurent Jullier, D.N. Rodowick and others.

31. [Note by the avatar of the author] See: http://arthemis-cinema.ca/en/news/596. The author of the present text participated in this conference, where he gave the Martin Walsh Memorial Lecture (Association canadienne d'études cinématographiques/ Film Studies Association of Canada, at the annual Congress of the Humanities and Social Sciences) entitled "*Home cinema* et agora-télé: deux oxymores de notre modernité médiatique" (unpublished).
32. [Note by the avatar of the author] In order to maintain uniformity in the present text, even though the word "image" is plural in the title of the conference ("Moving *Images* Studies"), I speak here of "moving *image* studies."
33. [Note by the author] In an email exchange on January 4, 2013, Martin Lefebvre explained to me that, in the beginning (around 2007-2008), *film studies* was the subject of the group's research. The initial name of ARTHEMIS was "Groupe de recherche sur l'histoire et l'épistémologie des études cinématographiques" (there was no corresponding English name). Lefebvre added: "In the meantime, I began work on a doctoral program [A.G.: Which began in the fall of 2008] and it was clear that its name was not going to be limited to Film Studies [A.G.: As I mentioned above, it is called 'Ph.D. in Film and Moving Image Studies']. [At the same] time, we were looking for an acronym for the research group. [...] As the Ph.D. was lining up to be Moving Image Studies, we began to play with different acronyms and we ended up with ARTHEMIS. [...] To the extent that ARTHEMIS's mandate concerns 'Moving Images' we are, in principle, opening research up to something other than cinema in a 'strict' sense of the term (meaning a certain agreed-upon meaning that has been more or less 'stable' in the language since the 'classical' period, before the issues raised by the arrival of new media)." On the question of the paradox that I raise, Lefebvre adds: "[I]t is only a residue of the previous version of the group, the pre-ARTHEMIS version. It is thus not really a paradox. [...] It's a leftover, no more and no less." The fact that the expression "film studies" owes the fact that it has been present on the home page of the group from 2007 to the present day to a slip-up speaks volumes, it seems to me, about the new realities facing film studies. Lefebvre acknowledges this, and writes: "[I]n the end, if we neglected to revise the description of our research objectives and distinguish between 'Film Studies' and 'Moving Image Studies,' it's because the theoretical unconscious didn't see any urgency, especially given that 'Film Studies,' from a certain point of view, can constitute a sub-set or province of 'Moving Image Studies.'" To which I would add: there is no doubt that such a slip, if it was one, is a demonstration (thank you, Freud!) of the return of the repressed.
34. [Note by the avatar of the author] There already existed, for at least a decade, a field known as "moving image studies," in which cognitive studies dominated (see the journal called *The Journal of Moving Image Studies* [see http://www.avila.edu/journal/index1.htm] and the "Society for Cognitive Studies of the Moving Image" – SCSMI [see http://scsmi-online.org/]) but there was no pretention at the time amongst their promoters to replace "film studies."
35. [Note by the author] All the websites referred to in this article were consulted a final time on February 27, 2013, the date my manuscript was submitted.

Experimental Media Archaeology: A Plea for New Directions

1. For a reflection on the work of Friedrich Kittler and his impact on the humanities, see the dialogue with Geoffrey Winthrop-Young in this book.
2. As to the field of film studies, these are some recent signs that a shift may take place in the direction of having more attention for the materiality of the medium; see Jane Gaines, "What Happened to the Philosophy of Film History?" *Film History* 25, no. 1-2 (2013): 70-80. Outside media archaeology, the digitization of film triggered a great many reflections regarding the past and future of the cinema and film archives too, though "very few of those publications have shed light on the consequences of this media transition on our perception of the filmic past," as Barbara Flueckiger argues in "Material Properties of Historical Film in the Digital Age," published in *Necsus European Journal of Media Studies* 2 (Fall 2012). Flueckiger refers to *From Grain to Pixel: The Archival Life of Film in Transition*, in which Giovanna Fossati "identifies a lack of exchange between archives and academic institutions." Fossati, she indicates, "establishes some very useful frameworks to investigate the topic by combining archival practices with a film studies perspective"; see http://www.necsus-ejms.org/material-properties-of-historical-film-in-the-digital-age/.
3. For a reflection on the terms *l'appareil de base* and *dispositif*, referring to the technological devices of film production and projection and the viewing situation respectively, see the chapter on Christian Metz and the apparatus theory in this book.
4. Jeffrey Ferguson, ed., *Designing Research in Archaeology: Examining Technology through Production and Use* (Boulder: University of Colorado Press, 2010).
5. Olaf Breidbach, Peter Heering, Matthias Müller, and Heiko Weber, eds., *Experimentelle Wissenschaftgeschichte* (München: Fink Verlag, 2010).
6. R.G. Collingwood, *The Idea of History* (Oxford: Oxford University Press, 1946), 218.
7. Ulrich Kühne, *Die Methode des Gedankenexperiments* (Berlin: Suhrkamp Verlag, 2005).
8. Michel Serres, *The Five Senses: A Philosophy of Mingled Bodies* (London: Continuum, 2008), 153.
9. For an overview, see "What Are Media?" by Lambert Wiesing in this book.
10. See Thomas Elsaesser, "The New Film History as Media Archaeology," *Cinémas: Revue d'Études Cinématographiques* 14, no. 2-3 (2004): 75-117.
11. Hans-Jörg Rheinberger, *Historische Epistemologie zur Einführung* (Hamburg: Junius-Verlag, 2007).
12. Otto Sibum, "Experimentelle Wissenschaftsgeschichte," in *Instrument – Experiment. Historische Studien*, ed. Christoph Meinel (Berlin: GNT-Verlag, 2000), 61-73. See also Bruno Latour and Adam Lowe, "The Migration of the Aura or How to Explore the Original through Its Facsimiles," in *Switching Codes: Thinking through Digital Technology in the Humanities and the Arts*, ed. Thomas Bartscherer and Roderick Coover (Chicago: University of Chicago Press, 2010), available at http://www.bruno-latour.fr/sites/default/files/108-ADAM-FACSIMILES-GB.pdf.
13. Jonathan Crary, *Techniques of the Observer* (Cambridge, MA: MIT Press, 1990), 7.
14. Wanda Strauven, "The Observer's Dilemma: To Touch or Not to Touch," in *Media Archaeology: Approaches, Applications, and Implications*, ed. Erkki Huhtamo and Jussi Parikka (Berkeley: University of California Press, 2011), 148-163.

15. See notes on Film as UNESCO World Heritage: http://www.imago.org/index.php?new=604. See also the highly interesting reflections by filmmaker Tacita Dean in "Film," *FIAF Journal* 86 (April 2012): 11-21, available at http://www.fiafnet.org/pdf/JFP/86.pdf.
16. Google being the most powerful of these radars nowadays; see Eli Pariser, *The Filter Bubble* (London: Viking Press, 2001).
17. Tony Bennett, "Speaking to the Eyes: Museums, Legibility and the Social Order," in *Politics of Display: Museums, Science, Culture*, ed. Sharon Macdonald (London: Routledge, 1998), 29.
18. Sharon Macdonald, "Exhibitions of Power and Power of Exhibition," in *The Politics of Display: Museums, Science, Culture*, ed. Sharon Macdonald (London: Routledge, 1998), 2.
19. On the loss of aura, see: Walter Benjamin, "The Work of Art in the Age of Its Technical Reproducibility: Third Version," in *Selected Writings, Volume 4: 1938-1940*, ed. Howard Eiland and Michael W. Jennings (Cambridge, MA: Harvard University Press, 2003), 251-283. On the different "dispositifs" created by (classical) cinemas and museums, see Raymond Bellour, *La Querelle des dispositifs. Cinéma – installations, expositions* (Paris: P.O.L. [Collection traffic], 2012). For a reflection on the media experience as an art experience, see Annie van den Oever, "The Medium-Sensitive Experience and the Paradigmatic Experience of the Grotesque, 'Unnatural' or 'Monstrous,'" in *Leonardo* 46, no. 1 (February 2013): 88-89.
20. We fully acknowledge the distinction between the film artifact (as a conceptual rather than material thing) and the apparatus artifact (as a material rather than a conceptual thing) as discussed by Fossati in *From Grain to Pixel*, pointing out that the tension between material and conceptual artifact is typical of film; see first and last chapters of her book. Note that we suggest that the apparatus in a strictly material sense, as *appareil de base*, is used for re-enactment, e.g., to tease out its performative qualities, inviting research on the artifact as a conceptual thing.
21. Some interesting notes on re-newing the experience of old media technologies are provided by Tom Gunning, "Re-Newing Old Technologies: Astonishment, Second Nature, and the Uncanny in Technology from the Previous Turn-of -the-Century," in *Rethinking Media Change: The Aesthetics of Transition*, ed. David Thorburn and Henry Jenkins (Cambridge, MA: MIT Press 2003), 39-59.
22. See the work of Madeleine Akrich and Bruno Latour on descriptions and inscriptions in *Shaping Technology, Building Society*, ed. W. Bijker and J. Law (Cambridge, MA: MIT Press, 1992).
23. See Andreas Fickers, "Design als 'mediating interface.' Zur Zeugen- und Zeichenhaftigkeit des Radioapparats," *Berichte zur Wissenschaftsgeschichte* 30, no. 3 (2007): 199-213.
24. The shift from archive to research laboratory was discussed in the one-day symposium "The Film Archive as a Research Laboratory," organized by the University of Groningen in close collaboration with EYE Film Institute The Netherlands, with Ian Christie, Eef Masson, Sabine Lenk, Frank Kessler, Roger Odin, Susan Aasman, Andreas Fickers, Heide Schlüpmann and Jan Holmberg; the symposium was hosted by Giovanna Fossati and Annie van den Oever, who will present the results of the

discussion in an anthology to be published in the *Framing Film Series* in 2014. See http://homemoviesproject.wordpress.com/events/symposium-the-film-archive-as-a-research-laboratory/.

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