TECHNICS

**Nicholas Baer and
Annie van den Oever (eds.)**

10

Technics

The Key Debates

Mutations and Appropriations in European Film Studies

Series Editors
Anna Backman Rogers, Nicholas Baer, Ian Christie, Dominique Chateau, Sarah Leperchey, José Moure, Annie van den Oever

Technics

Media in the Digital Age

Edited by
Nicholas Baer and
Annie van den Oever

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Editorial

The *Key Debates* series was launched in 2010 with the aim of revisiting "the central issues that continue to animate thinking about film and audiovisual media," which we have now done across ten volumes. All of these have followed a pattern of reexamining foundational texts and issues, while also investigating new lines of transmission and interpretation.

Our book series' dual interest in foundations and novel lines of inquiry is demonstrated by the prior two collections, *Post-Cinema* (2020) and *Spaces* (2024). In the editorial of *Post-Cinema*, we foresaw that the shutdown of communal cultural activity during the pandemic was likely to change the status of film and cinema in the contemporary mediascape – which it undoubtedly has done – accelerating the shift to an increasingly post-cinematic environment. As the volume indicated, however, post-cinema is less a radical caesura than a new set of relations between cinema's varied pasts and emerging futures. *Spaces* engaged with enduring texts and issues in media representation and reception while also further exploring the post-cinematic ecology, including chapters on lockdown as a mental space of communication and on new technologies such as drones and immersive virtual reality.

Questions of technology assume a central position in our tenth volume, *Technics*, as they did in our fourth volume from 2014, *Technē/Technology*. Addressing issues that have gained urgency over the intervening decade – from algorithms and artificial intelligence to digital infrastructures and geoengineering – the present volume features global perspectives from a variety of fields, including film and media studies, philosophy of technology, media theory, science and technology studies, media archaeology, and the digital humanities. This capacious approach is deliberate on our part: although European film studies remains core to our book series, crises such as the pandemic and climate change transcend European boundaries, and the post-cinematic ecology compels us to broaden our purview beyond film.

With the support of our institutions in five countries (France, the Netherlands, Sweden, the UK, and the US), and of our valued publisher, Amsterdam University Press, we provide a platform to revisit key debates, while also insisting that global film and media studies must be accorded a critical position in contemporary intellectual and cultural life.

Groningen / Amsterdam / Gothenburg / Berkeley / London / Paris
Annie van den Oever, Anna Backman Rogers, Nicholas Baer, Ian Christie, Dominique Chateau, Sarah Leperchey, José Moure

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PART I

Questions Concerning Technics

1. Technics: An Introduction

Nicholas Baer and Annie van den Oever

Abstract

This introduction argues that contemporary developments in the digital age (e.g., algorithmic media, generative artificial intelligence) are fundamentally reconfiguring the relations between key terms in the study of technology: technē, technique, technology, and technics. Returning to Martin Heidegger and other thinkers who have formatively shaped our conceptual understandings of technology, editors Nicholas Baer and Annie van den Oever offer a renewed exploration of the semantic field and preview the essays, statements, dialogues, and roundtable discussions featured in the volume.

Keywords: technē, technique, technology, film and digital media, philosophy of technology, Martin Heidegger

When Martin Heidegger pondered whether "modern technology is something incomparably different from all earlier technologies," he had in mind a technological landscape that may itself seem incomparably different from our own (Heidegger [1954] 1977, 14). Heidegger's "The Question Concerning Technology" ("Die Frage nach der Technik") juxtaposed machine-powered technology with traditional handicraft: the radar station versus the weather vane, mechanized agriculture versus conventional grain-sowing methods, the hydroelectric plant on the River Rhine versus the sawmill in a remote Black Forest valley. These juxtapositions are now seventy years old and we are thus compelled to raise a similar question as Heidegger: What is the mode of revealing of technology in today's digital world? And, if digital technology is incomparably different from all earlier technologies, the follow-up one inevitably is: Has Heidegger's essay, alongside other foundational writings on technology, reached its expiry date?

We are not the first to pose such questions or to feel tempted to believe that Heidegger maintained an allegiance to the older technologies rather

than the newer ones. Yet this assumption comes at a high price, as we will show – namely, a misassessment of his essay's ongoing relevance and a misinterpretation of its central term, technics (*Technik*). In *Technē/Technology* (2014), volume 4 of our *Key Debate*s series, Robert Sinnerbrink argued that, although Heidegger's penchant for huts and *Holzwege* may have suggested a stance of nostalgia or even neo-Luddism, it would be wrong to assume that the philosopher simply dismissed new technologies: "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.' 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" (Sinnerbrink 2014, 70).

For Heidegger, a free relationship involves opening our existence to technology's essence. "The Question Concerning Technology" shows the untenability of common definitions of technology as an instrumental means or human activity, and instead identifies the fundamental characteristic of technology as revealing. For Heidegger, modern technology's mode of revealing is a setting-upon or challenging based on the extraction and storage of energies, reducing nature to a mere standing-reserve. His essay ultimately arrives at enframing (*Ge-stell*) as the mode of revealing in which the essence of modern technology lies: "Enframing means the gathering together of that setting-upon which sets upon man, i.e., challenges him forth, to reveal the real, in the mode of ordering, as standing-reserve" (Heidegger [1954] 1977, 20). In Heidegger's view, enframing conceals not only a prior mode of revealing, *poiēsis* or bringing-forth, but also its own fundamental characteristic of revealing – and, with it, the appearance of truth.

Animated by both ontological and ethical concerns, Heidegger's essay offers numerous examples of the prevailing ordering of the real as a standing-reserve of potential resources – among them natural elements (e.g., coal, ore, uranium), human beings ("human resources"), and socio-technological creations, such as the airplane on the runway that ensures the possibility of transportation: "it must be in its whole structure and in every one of its constituent parts, on call for duty, i.e., ready for takeoff" (Heidegger [1954] 1977, 17). Updating Heidegger's examples for our own time, we would also need to consider the digital media technologies that place us permanently "on call" and define us as algorithmic ensembles of information, quantifiable desires, and instrumental actions; artificial intelligence (AI) as a new form of predictive coding and data mining; and, not least, the ongoing climate catastrophe driven by the literal extraction and exploitation of natural resources, rendering the planet increasingly

uninhabitable. In light of these examples, it is easy to see why Heidegger's essay is still relevant today.

At once pervasive and invasive, technological developments such as algorithmic media and generative AI are transforming our very mode of existence, raising a whole host of pressing issues explored by the twenty-eight contributors to this volume: ableism, access, agency, automation, geoengineering, infrastructure, knowledge production, racial and gender bias and discrimination, surveillance, and warfare, among countless others. Far from marginal or obsolete, the Heideggerian question concerning technology – and especially the potential for a liberatory rather than oppressive relationship to technology – has gained great urgency. The argument of this volume is that the contemporary digital age is fundamentally reconfiguring the relations between technē, technique, technology, and technics. It is thus a crucial moment to reexamine the ideas of Heidegger and further thinkers who have shaped, challenged, and extended our conceptual understandings of technology, including Walter Benjamin, Ursula Le Guin, Bernhard Siegert, Gilbert Simondon, Bernard Stiegler, and Sylvia Wynter.

Media in the Digital Age: A Semantic Void

Returning to key terms in the study of media – technē, technique, technology, and technics – this volume offers a renewed exploration of the semantic field, clearing what Gregory Bateson called the "conceptual fog" created by hazily defined explanatory notions (Bateson 1972, xx). Already in *Technē/Technology* (2014), Benoît Turquety cautioned against the unreflective use of terms that had distinct meanings in the mechanical era, which is epistemologically different from the digital one. Where technology was once considered within a conceptual realm that often centered on the mechanical art of cinema, the digital age has shifted the general understanding of technology in the cultural sphere: "digital techniques – machineries and processes, apparatuses and workflows – are perceived as belonging to a slightly different conceptual structure than mechanics" (Turquety 2014, 63-64).

Etymologically derived from the Greek root *technē* (art, craft, skill, know-how) and the suffix *-ology* (branch of knowledge), the term "technology" entered the English language in the seventeenth century but did not gain broad currency until after the Second Industrial Revolution (ca. 1870–1914). Leo Marx attributes the term's popularization to the prevailing ideology of progress and to changes in the organizational and material matrix

(large-scale, complex sociotechnological systems), which together created "a semantic void, that is, a set of social circumstances for which no adequate concept was yet available" (Marx 1997, 967). The widespread adoption of the abstract, even indefinable concept of technology thus had a symptomatic value: it marked the inaptness of prior terms (e.g., machine, invention, improvement, the mechanic arts) in relation to the ambiguous developments in nineteenth- and early-twentieth-century society and culture.

With its vague and often contradictory meanings in both popular and academic discourse, the concept of technology comes with many hazards. Integrating a critique of capitalism lacking from Heidegger's analysis, Marx warns that technology has become a reified term, "used as if it referred to a tangible, determinate entity – a kind of thing" (1997, 981). Ascribed an objective, autonomous agency, technology is seen as an external threat to the humans who created it, leading to mystification and a sense of fatalistic passivity. Moreover, inasmuch as the concept is commonly projected backward to encapsulate the full history of tools, it elides the social conditions for which technology once served as a historical marker. Where Marx ultimately doubts whether the concept allows for cogent, analytical thinking, we might also consider whether technology is still the best referent for the novel formations that characterize the reconfigured landscape of our own digital age.

In interrogating the concept of technology amid the semantic void in our own time, questions of cultural-linguistic context and intellectual genealogy become salient. For, if the term "technology" is shrouded in ambiguity and reified understandings today, this is also due to the peculiarities of its English usage. Where many European languages distinguish between *technique* (the object of study; the mechanic arts) and *technology* (the field of study; the *logos* or science of techniques), the English word "technology" has generally referred to the former since the turn of the twentieth century (with the notable exception of schools such as the Massachusetts Institute of Technology, established in 1861). Crucial distinctions are thereby lost in translation, particularly as cognates of both *technique* (*die Technik* in German, *la technique* in French) and *technology* (*die Technologie*, *la technologie*) can be rendered in English as "technology" (Schatzberg 2018, 8-13; see also Altman 1984).

In the first decades of the twentieth century, American social scientists such as Thorstein Veblen transposed German discussions of *Technik* into English deliberations on "technology." Lewis Mumford, by contrast, rendered *Technik* as "technics" in his *Technics and Civilization* (1934), dividing the development of machine civilization into "eotechnic," "paleotechnic," and

"neotechnic" phases, yet his terminological efforts ran against the dominant trend. It was Don Ihde who would later re-embrace and popularize the word "technics" for its dual connotations of action and artifact. In his introduction to *Existential Technics*, Ihde wrote: "Technics stands in between the too abstract 'technique' which can refer to any set action with or without a material object, and the sometimes too narrow sense of technology as a collection of tools or machinery. Central to my understanding and use of technics is the sense of human action engaged with, through, among concrete artifacts or material entities" (1983, 1).

While, as Ihde noted, North American thinkers had rarely focused on the role of technology in human life, European intellectuals had a more extensive tradition of the philosophy of technology, including Marxist, phenomenological, and existential schools. Ihde nonetheless wrote at a moment of heightened Anglophone interest in Continental philosophy – interest that has continued to be piqued by the publication of texts such as Michel Foucault's *Technologies of the Self* (1988), Ernst Kapp's *Elements of a Philosophy of Technology* (*Grundlinien einer Philosophie der Technik*, [1877] 2018), Bernhard Siegert's essay collection *Cultural Techniques*: *Grids, Filters, Doors, and Other Articulations of the Real* (2015), Gilbert Simondon's *On the Mode of Existence of Technical Objects* (*Du mode d'existence des objets techniques*, [1958] 2016), and Bernard Stiegler's three-volume series *Technics and Time* (*La technique et le temps*, [1994, 1996, 2001] 1998, 2009, 2011). In the process, the English term "technics" has gained greater currency alongside the familiar "technique" and "technology."

Translations of the past years have also underscored the often-ambiguous range of meanings of terms such as *Technik*. In an overview of German media theory, Bernard Dionysius Geoghegan notes that *Kulturtechniken* – which might be translated as "cultural techniques," "cultural technologies," "cultural technics," or "culturing techniques" – was in fact a nineteenth-century term for agricultural engineering (2013, 67). Given this semantic history, it is no coincidence that Heidegger juxtaposed modern and traditional technics in the form of the mechanized food industry and older grain-sowing methods. Where Heidegger's "Die Frage nach der Technik" has commonly been translated as "The Question Concerning Technology," this title obscures the essay's major themes and stakes, as Geoghegan contends: far from rejecting technology out of hand, Heidegger seeks to reunify technique, technology, and culture under the ancient Greek *technē* (2013, 74).

Advocating for a more differentiated set of terms, our volume not only heralds a shift from technology to technics, or from "The Question Concerning Technology" to "The Question Concerning Technics." We also emphasize

the plurality of questions concerning technics today. Such questions, we insist, demand diverse theoretical, historiographical, and methodological approaches, as well as a global, intermedial, and multidisciplinary scope – including film and media studies, media theory, media archaeology, media infrastructures, science and technology studies, digital humanities, critical race theory, postcolonialism, feminism, critical disability studies, and the environmental humanities. In pursuing multiple lines of inquiry, our volume embraces a mix of textual forms, from essays and statements to dialogues and roundtable discussions. Exploratory in nature, the chapters in our volume map out the conceptual relations that, as we argue, are being fundamentally reconfigured by the digital era.

About the Book

We open the volume with a survey of the current field of thinking about media and technology through ten statements by scholars and artists: André Brock, Dominique Chateau, Beth Coleman, Shane Denson, Amanda Egbe, Yuriko Furuhata, Tom Gunning, Jeffrey West Kirkwood, Laura Mulvey, and Jean-Christophe Plantin. This multidisciplinary and multigenerational group reflects on their past work, while also sharing their latest thoughts on issues such as algorithmic media, digital infrastructures, generative AI, and geoengineering. Additional topics of discussion include key thinkers, concepts, and approaches and the (geo)political stakes of contemporary inquiries into media devices and practices. These lines of inquiry are further pursued in subsequent chapters of the volume.

Part II focuses on philosophies of technology in the modern era. Allaying present-day anxieties regarding human displacement via automation and AI, Gertrud Koch argues for a more dialectical understanding of human-machine interrelation, which she elaborates via an intellectual trajectory extending from Karl Marx and Friedrich Nietzsche, through Max Weber and Ernst Cassirer, up to Friedrich Kittler and Jean-Louis Comolli. Amid ongoing concerns over technological warfare, Astrid Deuber-Mankowsky draws a sustained comparison with Kantian philosophy in examining Walter Benjamin's diagnosis of the crisis of perception (*Anschauung*) and experience wrought by the First World War. Much as Koch posits the aesthetic sphere as one of playful experimentation with technology, Deuber-Mankowsky contends that Benjamin's "To the Planetarium" sought to help construct a "room-for-play" (*Spielraum*) – one in which technology recalibrates the

relationship between humanity and nature, rather than serving as an instrument of domination and destruction.

The following two chapters spotlight thinkers who have gained prominence in the Anglophone world thanks to recent translations. Engaging with Gilbert Simondon, Benoît Turquety locates the instructional manual at the interface between human and machine, viewing the user's guide as a manifestation of the technicity of media devices such as Bolex cameras. Ranjodh Singh Dhaliwal stages a conversation with Bernhard Siegert, who has elaborated the aforementioned concept of cultural techniques (*Kulturtechniken*). Delineating the terms technē, technique, and technology, Dhaliwal and Siegert discuss issues of etymology and semantic change, of historicism and anachronism, and further address the relations between mediation and techniques, and between cultural techniques and institutions.

Part III features novel interventions in the field of media theory. Where Francesco Casetti conceives of media as forms of protection against external dangers, allowing humans to reconnect with the world on more secure terms, Yijun Sun and Bernard Dionysius Geoghegan draw from Ursula Le Guin to advance a carrier bag theory of media, which they exemplify through the vacuum tube. Interweaving their scholarly trajectories and embodied experiences, Neta Alexander and Jonathan Sterne reflect on technology through a disability-informed lens and emphasize the persistence of ableism in media studies. All three chapters challenge Marshall McLuhan's famous understanding of media as "extensions of man" – whether for overlooking the sheltering function of media, perpetuating masculinist and phallocentric ideologies, or assuming able-bodiedness and treating prosthesis solely as a metaphor.

Media archaeology moves to the fore in Part IV. With her hands-on, material, and playfully experimental approach to media archaeology (recalling Benjamin's "room-for-play"), Wanda Strauven explores the emergence of the smartphone and its varied terminology across European languages, with anecdotes from her family life and excursuses into the history of candies, plastics, emojis, and games. Similarly focused on children's media, Doron Galili studies the contemporary case of the "Makrentz'ik," a toy magic lantern marketed to the Jewish ultra-Orthodox (Haredi) community. Inasmuch as the magic lantern is often regarded as obsolete, the Makrentz'ik's coexistence with digital devices complicates established narratives about old versus new media technologies. Strauven's and Galili's chapters illustrate the nonlinear temporalities of media archaeology – known for its deep time, palimpsestic layers, cyclically recurring topoi, and Foucauldian ruptures

and discontinuities – while also extending the field to a more personal domain and to underexamined contexts of media practice.

Revisiting film against the backdrop of today's rapidly changing media environment, Part V investigates the specific techniques of framing, split screen, and montage. Ariel Rogers contributes to debates about "immersive" media such as 3D cinema and virtual reality, tracing a genealogy of theories of the frame and framing in cinema – from classical film theory up to recent work on race as technology. Likewise transhistorical in their scope, Catherine Grant, Malte Hagener, and Katharina Loew discuss the varied uses of split screen in film and media history, including examples from the nineteenth century (e.g., picture postcards, lantern slides) and the present-day mediascape (e.g., video essays, multichannel art installations). Kartik Nair considers the affordances of digital editing software programs such as Adobe Premiere Pro, arguing that the verse jumping in Everything Everywhere All at Once (Daniel Kwan and Daniel Scheinert, 2022) lends allegorical expression to the shifting terrain of editorial labor.

As the volume's chapters indicate, digital technologies have inaugurated a paradigm shift in film and media culture. In Part VI, Malte Hagener focuses on the ramifications of digitization for film studies, engaging with recent scholarship on infrastructures and reflecting on questions of access, metadata, and method. With a similar attention to the political economy of digital knowledge infrastructures and institutions, Annie van den Oever leads a conversation with Andreas Fickers on epistemic virtues in the digital humanities. Structured around Italo Calvino's *Six Memos for the Next Millennium* (1988), their conversation covers the latest topics of debate in the digital humanities, including the geopolitics of knowledge and the problems of epistemic inequality and injustice. Much as Hagener lays out individual, collective, and political spheres of action, Fickers ultimately calls for a new "style of reasoning" characterized by epistemic, political, and ethical virtues. Taken together, the chapters in this volume thus pursue crucial questions concerning technics, providing cutting-edge reflections on media and technology for the contemporary digital age.

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Annie van den Oever is a Professor of Film at the University of Groningen; an Extraordinary Professor of Film at the University of the Free State (until January 2024); and a Senior Research Associate at the University of Johannesburg (since March 2024). Recent books: *Doing Experimental Media Archaeology. Theory* (De Gruyter, 2022, with Andreas Fickers); and *Digital Distortions and the Grotesque as a Dominant Format Today* (AUP, 2024).

2.   Ten Statements on Technics

André Brock, Dominique Chateau, Beth Coleman, Shane Denson, Amanda Egbe, Yuriko Furuhata, Tom Gunning, Jeffrey West Kirkwood, Laura Mulvey, and Jean-Christophe Plantin

Abstract

To understand how preeminent scholars and creative practitioners approach the topic of technology today, Nicholas Baer and Annie van den Oever invited them to reflect on a series of questions: What drew them to technology as a matter of inquiry, and how have developments of the past decade extended, shifted, or even challenged their thinking? What is a recent media-technological development that bears on their work, and how does the contemporary mediascape realign the relations between technē, technique, and technology? Which theoretical, historiographical, and methodological approaches are especially generative, and which texts warrant further attention? Finally, how does their work think through (geo)political issues such as power, access, and accountability; participation, engagement, and activism; and racial, social, and environmental justice?

Keywords: film and media studies, philosophy of technology, science and technology studies (STS), media infrastructures, environmental media, artificial intelligence (AI)

André Brock:
When I started studying the internet in the early 2000s, the accepted wisdom was that the default internet user was white, male, middle class, Protestant, and straight. The trouble with accepted wisdoms, however, is that few people attempt to interrogate them. Moreover, the newness of internet use meant that we (I'm including myself in this) treated it as if it were a new form of human-machine sociality, where we could identify humanity as a (insert platform/app here) "user." That left little room for interrogating how those

users were always already embedded in sociocultural contexts before ever touching a keyboard or mouse.

The phenomenon I've invested my career in is this: Black people have always used information technologies/the internet. Thanks to accepted wisdom and digital divide scholarship, I was often asked "how do you even know they're Black?" So it was only when Black digital practice became hypervisible thanks to Twitter affordances – specifically, the hashtag – that people began to understand that race could be a salient indicator of digital practice and even expertise. These affordances have lost much of their glamour as the furores over George Floyd and COVID have receded to become an infrastructural hum of disquiet. But if I had told you in 2003 that the humble octothorp would become a vital organizing tool for digital information and for social justice ... would you have believed me? The hashtag helped to cement the recognition that race is inherently an aspect of technoculture.

Dominique Chateau:
Technique and technology are the topic of numerous debates that presuppose or make explicit a hypothetical mythology of the original – and this comes with philosophical implications, among them the existence of a pre-philosophical time that philosophy would aspire to rediscover; and film-theoretical implications, among them a film ideal for which pre-technical reality provides the model. While it is pertinent to rediscover archaic aspects in the invention of cinema, as Edgar Morin ([1956] 2005) does, these philosophical and theoretical perspectives come with a huge disadvantage for the field of film and media studies. Because they are associated with the denial of representation (as a case of presence, of being, etc.), they do not allow us to understand how and under what conditions a technological device can function as a medium of representation of reality. In other words, these perspectives overlook the crucial function of the technological devices under scrutiny (for instance, in film and media studies) as media which mediate reality in specific ways. As for film: the primary and most important *medium-specific* element of its technological mediation is motion or movement, which, when rendered on screen, produces an effect of presence. (Christian Metz [1991] is right, not Gilles Deleuze [1986, 1989], when it comes to the effect of presence created by the *movies*.) In other words, presence as an effect created by the movies is not unique, mysterious, or ontological; it is constitutive of filmic technology. Presence is the raison d'être of a medium which, even before any narrative situation is represented, constitutes as present what it represents.

While presence is the first and most important factor brought about by film's medium-specific technological mediation, the second factor is the modalities of perception brought about by film or digital technology – see Walter Benjamin's excellent formula: "sense perception altered by technology" (Benjamin 2002, 122). The transformational power of the medium has notable ontological implications. Following Benjamin, we could argue that human ontology is transformed by technology. This second factor has been at the heart of a fierce debate by critics, among them Benjamin himself, who were ambivalent about the effect on perception brought about by technology, and hesitant to frame it along the lines of two familiar themes: either the loss of aura or the gain of cinema as a popular art. Regardless of the outcome of such debates, we may conclude on the basis of the reflections on the two factors examined so far (there are others, of course) that the effect of presence and the shock of the image, montage, and visual effects conspired to define the new medium as an ontological and psychological transformation of the world.

It is from the perspective of such a theoretical approach to the mediation of reality provided by film techniques that we can grasp the practical effectiveness of film. As Gaston Bachelard ([1940] 1968, 119) suggests, this involves accessing a concept of film that represents it as a *superobject* (in French, *surobjet*). For the philosopher, the concept of the superobject implies (entails) the history of concept formation, exemplified by the concept of the atom in theoretical physics. In light of a technological history as in the sciences, the analysis of film understood as a superobject (an object beyond the semantic atoms manipulated in ordinary discussion) opens up a complex parametric interplay: as the phenomenon itself is defined, the basic atom cracks, disseminates, and explodes:

1) first, within the triad of device/medium/apparatus, used to specify the social dimensions of film, and to stress that the medium is the pivot; and that mediation moves from one screen device to another, from IMAX to the smartphone, and from one dispositif to another, from the cinema hall to the living room; and

2) second, within a whole host of terms and concepts – parameters, if you wish – whose consideration directs our attention toward a further decomposition of the superobject in terms of its traits, such as fixed/nomadic, dedicated hall/domestic setting, projection/backlighting, integral medium/hybridization, optical distance/haptic possibility, and so on. In short, the technological superobject called film is the product of critical reflections, not in the negative sense of denial or denigration, but in the positive sense of that human faculty Bachelard calls "polemical reason" ([1938] 2002, 22).

The latter, when it leads to a multiparametric vision, enables us to understand the full richness of technique and technology (particularly in the manner of Gilbert Simondon [2017]). The antinomy of technique and ontology (known as realism) presupposes a pure state of the world or of knowledge, as origin or ideal, obviously without technique. But humanity started off as a social species in which, from the outset, technology was an integral part (see agriculture). Technology is humanity! It is an integral part of human history. There is no dichotomy between humanity and the specific knowledge (techno-logos) that constitutes it: because technique and technology, with their specificity, have never ceased to be decisive for humanity.

Beth Coleman:
My genealogy of technē would be Greeks>Heidegger>Stiegler>Glissant. The term and critical praxis around it have been a point of obsession for me from the beginning of thinking and doing with technology. If one sticks with the awkward translation of "know-how," then the situation of actor-material is foregrounded. The phenomenal aspect of technē is central to the worlds it produces. Yes, already "worlds," as I cannot resist the possibility of liberation technologies. This is clear in my writings, from "Race as Technology" (2009) to "Technology of the Surround" (2021). Within this context, I make the jump from technē to technology as the thing that does a thing. I am not sure I have a conviction or commitment to technique other than as a pale specter between the two beloved, vexing terms.

Feel free to make fun, but ChatGPT is the technological phenomenon that has my attention. And, if we attend to the AI engineering literature, attention is everything. It (ChatGPT) is not *an account* of technē, as the current AI chatbots do not demonstrate "know-how." In fact, the ways they don't know or hallucinate or genuflect are amazing theater but not the ability of technē. I am interested – perhaps we all are interested – as it is the first public demonstration of turning on an AI "lightbulb" or watching the AI gilded Digesting Duck. Equal parts new technology and legerdemain.

Perhaps I was dropped on my head as a baby, but technical apparatuses have always been interesting to me. I am interested in the architecture of how a thing works in relation to the social world of how it works. Obviously, that is the sociotechnological. But the thing that floors me is that thinking those things together continues to be entirely alien on account of disciplinary silos. Machine-learning people duck when the word "social" shows up, and media studies often struggles to move beyond systems of signs (not sure if we have the Frankfurt School to blame for that). I began my graduate

studies in philosophy of technology (a.k.a. comparative literature) while running an art studio, SoundLab, where we made new technologies for the internet age. In my early work on avatars, I was interested in the social world of virtual agency. So, for me, inquiry has continuously been tethered to that obscure object of desire, technology.

As discussed above, I primarily move between technē and technology in my work. I see technique as a secondary aspect. And yet, the contemporary mediascape realigns the semantic forcefield, as one has been surrounded by technology that fails to acknowledge technique. The frequent violence that is the state of social media might have been better acknowledged, if not better managed, if there were industry accountability for technique. It seems the necessity of precise conceptual distinctions of media technologies is even more pressing now. If we think of the advanced automation turn as a "general purpose technology," like electricity or the internet, then the importance of distinguishing military from civic from public is pronounced. And yet, we are distinctly in a state of catch-all panic that only supports a particular narrative of techno-determinism. Film can inhabit the amphibian state of technique and technology without being culturally disruptive, as it is known in temporal, narrative, and dimensional form. The contemporary phase shift of advanced automation is environmental immersive technologies that surround although often invisible. These are a different beast.

I think it is a great time for many more of us to attend to Sylvia Wynter's work, on "After Humanism" (1984). Whether we think of Bruno Latour and actor-network theory (2005) or Geoffrey C. Bowker and Susan Leigh Star's sorting of things (1999), it is crucial to remember where we are on sorting systems, sorting humans, sorting things and the world. In terms of recent changes in technology-shaping research methods, I see a clear shift toward working collaboratively with machine-learning researchers, as well as working hands-on with generative tools. It means my publications are looking like multi-authored papers at ACM (Association for Computing Machinery) conferences as opposed to traditional humanities/STS. It won't stay like that forever, but I am interested to see how critical frameworks and computer science/engineering technē can better cross-pollinate. My creative practice mirrors the scholarly one in the sense that I often take on new tools and work with them in a way that is against the cultural grain. For example, in the project and book *Reality Was Whatever Happened: Octavia Butler AI and Other Possible Worlds* (2023), I train a generative adversarial network (GAN) AI, away from the photo real and human likeness.

On a good day, my work thinks through geopolitical issues in a relational way: power can't be thought without shades of access and accountability.

At this point, participation ends up being a bit of a creepy word for me, as the last two decades of social media have been directed at "participation" in a way that forecloses on consent. In the face of the institutional legacy of hegemony, engagement and activism are mission critical. If we do not speak out against the forecasting of the past as the future, we won't have a future. I think racial/social/environmental justice is part of that, although justice, like participation, has had a tough go of it in this millennium. Methodologically, STS and Black studies are powerful engines for me, and I apply them to technology infrastructure, data studies, and media archaeology. I am working on cities and data and AI & Society. So more recently I have been doing work that sounds like policy studies – trusted data sharing, responsible AI, and so on. But I'm pretty sure it's the same methods of the sociotechnological that I've developed through the works of Lucy Suchman (2007), Michelle Murphy (2017), Rosi Braidotti (2011), Wendy Chun (2008, 2011) … it's a long list. It's nice to have such good company in troubled times.

Shane Denson:
The phenomenon that I have been most interested in lately concerns a broad transformation in the media environment – one that has a lot to do with the media-technological developments that others have pointed out here. Whether it is generative AI, or the aggregative and algorithmic systems of social media, or the more literally environmental technics of geoengineering efforts, what we are witnessing is a shift from past-based or "mnemotechnical" (using Bernard Stiegler's term) to more decisively future-oriented or protentional forms of mediation that effectively lay the groundwork, predictively and in advance, for emergent agencies. This is something that I have described, in my book *Discorrelated Images* (2020), as a shift from "cinematic" media (based in the recording and replay of past events) to "post-cinematic" media (which operate in a generative mode, oftentimes producing new images and other sensory contents in real time). What's at stake here more broadly, however, is hardly confined to audiovisual media. Rather, it concerns the technical operationalization of microtemporalities, allowing contemporary media technologies to bypass subjective consciousness and operate on its very ground – including the presubjective and microtemporal processes of embodied and environmental metabolism (something that I have elaborated on in my more recent book, *Post-Cinematic Bodies* [2023]). Of course, these material and environmental dimensions of media and mediation are not entirely new; we might think of photochemical processes, or environmental reactions, such as oxidation

and decay, along these lines as well. What is new, however, is the precision and control that are enabled by algorithmic media. Operating faster than thought or perception, these media tap into our temporal becoming, tracing out grooves within which phenomenal experience can unfold. Thus, while media have always been environmental (both literally and in the metaphorical sense of "media ecologies"), they would seem to form the total environment today for subjectivities and collectivities that – while not absolutely predetermined – have in an important sense been anticipated and, we might say, "parameterized."

If there was a single *object* that drew me toward thinking about and theorizing technology as a primary area of concern in my work, it was Mary Shelley's Gothic novel *Frankenstein*, first published in 1818 – in the wake of the still recent split between "art" and "technology" in European languages. A long line of feminist thinking has traced the ways that Shelley was attuned to the transformations of gendered embodiment and sociality in relation to the Industrial Revolution. Meanwhile, work in philosophy of technology and in science and technology studies, read alongside (and often in tension with) post-structuralist thinkers, helped me to see how technology's impact could not be reduced to the domain of discourse alone; rather, technology – as I came to see it – had material and environmental impacts that, by way of the body's prepersonal sensitivities, could transform subjective and collective relations to the world. Rather than mere applications of science, industrial-era technologies like the steam engine *led* scientific theorization; thermodynamics developed out of an attempt to theorize these new technologies, which had already reshaped life, labor, and experiences of time and space. Two of my first publications turned to *Frankenstein* in order to think about these dimensions of technology; one of them ("Frankenstein, Bioethics, and Technological Irreversibility" [2007a]) developed a theory of "technological irreversibility" that extrapolated from Shelley's novel in order to think about the transformations of agency at stake in biotechnical interventions, while the other article ("Incorporations: Melodrama and Monstrosity in James Whale's *Frankenstein* and *Bride of Frankenstein*" [2007b]) looked at the role of *Frankenstein* in mediating the media-technical shift from silent to sound film. Together, these twin interests in what can loosely be called technology's ontological dimensions and its cultural-phenomenological ones (as reflected in the estimated 200 filmic adaptations of *Frankenstein*, each responding to new media-technical developments, contexts, and constellations) laid the basis for my first book, *Postnaturalism: Frankenstein, Film, and the Anthropotechnical Interface* (2014).

Since then, I have continued to focus on ways to combine the ontological and the cultural, while recent work has refined and refocused these interests in terms of specifically environmental and aesthetic transductions of agency in relation to technics. In recent thinking, I see some of my earliest attempts to theorize the Frankensteinian dimensions of biotechnology (and the fundamental challenges that biotechnics poses to bioethical questions that rely on pre-existing subjects capable of deliberation) resonating with the rapid developments we are witnessing with respect to generative AI. Because the latter operate predictively and outside the purview of subjective awareness, they are capable of subtly reconfiguring the parameters of subjectivity itself. My argument is not that AI will "outsmart" humans (or similar science-fictional scenarios, based in the idea of technical and artificial "intelligence"), but rather that machine-learning algorithms (e.g., in diffusion models that produce the real-time spectacles of AI art by the likes of Refik Anadol or Ian Cheng) can undercut consciousness, impinging directly on our embodied, metabolic processing of the visual, thus shifting the ground beneath the seeing subject. As a result, I contend, there can be no AI ethics without a prior assessment of AI aesthetics. And I think, ultimately, that this applies to any consequential technological development, which is first a transformation of the broadly aesthetic (i.e., sensory) environment for consciousness. It is certainly the case for contemporary, algorithmic, and future-oriented technologies.

In all of this work, I often find myself thinking about the relations among terms like *technē*, *technique*, and *technology*, and especially what these terms say about historically shifting relations and interfaces between human and technical agencies. As is well known, the term *technology* first enters into European languages around the time of the Industrial Revolution – coinciding roughly with both the steam engine and the advent of philosophical aesthetics. That, to me, is itself worthy of theoretical and historical consideration. The art/technology split drives a wedge right into the heart of a previously more-or-less undifferentiated field of *making*, as framed by both the Latin *ars* and the Greek *technē* before it. Afterwards, art, craft, industrial technology, and other forms of making become at least somewhat more clearly delineated, with significant consequences for various conceptions of individual (authorial, artisanal, and/or industrial) and collective (market-oriented or class-based) agency, among other things. Interestingly, technology originally referred to the quasi-scientific or analytical study of what we later came to name with that term (while many European languages, like German, retain *Technik* as the more common term alongside the less everyday *Technologie*). Originally, *technology* suggests, in a sense, a greater

distance from the direct action of *technique,* which suggests a tool-like or instrumental relation according to which agency resides in the subject (and in this early analytical distance, we perhaps find the seeds of the alienated distance of industrial and postindustrial technology). All of this is of course well known. The reason I recount it here is, first, simply to foreground the contingency of this field of meaning, along with the self-conceptions that it conditions for human agents; second, and related to this basic contingency, I believe we are witnessing another major shift in these relations, or in what Beth Coleman refers to above as the "semantic forcefield" around them. As I have said before, AI and other algorithmic technologies fundamentally redistribute agency; in the form of AI art and related generative, computational forms, they also challenge the split between art and tech, portending a reconvergence or at least reconfiguration of relations. And at the heart of this reconfiguration we find precisely a question of media and mediation, which has always been the tacit common ground between the estranged realms of art and technology – for only in the wake of this estrangement do concepts of communicative, expressive, and artistic media and mediums flourish. Today, with the emergence of futural, generative, and predictive media technologies, we must ask again what a medium is, and what it is a medium *for.*

This is the background for the work I am doing now on serialized media, typification, and generativity, drawing on the still understudied late work of Jean-Paul Sartre, whose 1960 *Critique of Dialectical Reason* Fredric Jameson once referred to as providing "the only genuine philosophy of the media" (Sartre 2004, xxviii). Sartre's fusion of existentialism and Marxism in this late work could be very significant, I think, for theorizing what has variously been termed "cognitive capitalism," the "attention economy," and the like. The resources of phenomenology have not been exhausted, and they are very much needed today, even though the contemporary capture of attention and awareness often operates, as I have said, by way of bypassing consciousness, or eluding the window of phenomenality itself. Sartre's turn away from the solipsistic method that arguably inheres in his early work (and, according to some interpretations, in phenomenology generally) and toward collectivity and the material environment as a repository and constraint on human agency is invaluable today. Clearly, we need to update some of his concepts, such as the "practico-inert" – Sartre's term for the built environment, commodities, and "worked matter" generally, which stores and retains the agency of human praxis and labor while condensing it into inert, objective form. As Sartre shows, such objects exert an important enabling and constraining force in shaping individual and collective existences,

and this alone is worth returning to. But in an age of smart technologies and predictive algorithms, the landscape of worked matter is hardly inert anymore. It is active, predictive, anticipatory, and exhausting. It drains us of our energies, while channeling our conscious and preconscious agencies and identities into pre-defined and pre-formatted categories. This is no longer the practico-inert but rather the *practico-alert*.

What I have been describing here as a shift toward futural modes of mediation, or the shift from Sartre's "practico-inert" to a new, protentional technics of the practico-alert, is in fact all about the consolidation and exercise of power, expressing itself most directly in predictive forms of typification – forms of categorization, whether racializing or gendering, for example, that operate on our bodies and minds in advance of our ability to perceive or act in the world. Sartre's concept of "seriality" – which for him describes the mutually alienated form of social collectivity that emerges around the industrially standardized lifeworld, its built environments, and commodity objects – offers a useful starting point for thinking about this political dimension. Feminist philosopher Iris Marion Young (1994) famously argued for a reconception of gender as a Sartrean seriality – which is to say, as a negatively and materially imposed category, not biologically determined nor voluntarily chosen either. Together with resources drawn from Black studies and Black feminism in particular, including Hortense Spillers's (2003) distinction between body and flesh, and Sylvia Wynters's (2001; Wynter and McKittrick 2015) thinking about the "sociogenic principle" and various "genres of the human," I think there are ample resources for thinking race and racialization under the category of serialization as well. And this line of thinking acquires its full force, I believe, when we take note of the shifting parameters of serialization, which is to say: the shift of media-technical operations and agencies from the memorial to the futural, which allows for the inscription of serialized categories directly into the flesh and the algorithmically computed environment itself.

Amanda Egbe:
Artificial intelligence continues to occupy a central place in my contemplation of the realm of moving images and media in general. The ramifications of AI's impact on creativity resonate with me deeply, especially from my standpoint as a practitioner.

A significant critique that has emerged within the field of AI and computer science around racial bias, articulated by figures like Timnit Gebru, has sought to identify frameworks and strategies from the arts and humanities

that could serve to mitigate concerns related to representation (Jo and Timnit 2020). This line of thinking has guided me to reflect on the nature of datasets employed in AI and how this aligns with concepts like Lev Manovich's "database cinema" (1999). Additionally, it draws parallels to moments in art history, such as Aby Warburg's *Mnemosyne Atlas* ([1924-1929] 2009), prompting me to contemplate how categorization and meaning-making occur. Specifically, I'm interested in exploring how images positioned next to each other influence representation and the dynamics of moving images.

I delve into the relationship between images by reconsidering the context of pre-cinematic technologies like the stereograph, the flipbook, and magic lantern slides, all the while considering the intricacies of bias and representation. This inquiry provides an avenue to examine creativity intertwined with technology, transcending simplistic dichotomies and uncritical media histories. When examining the historical utilization of moving-image technology by Black filmmakers or representations of race, these strategies of managing image relationships offer a pathway to explore the creative capacities of artificial intelligence. Moreover, they open novel avenues for reevaluating the fundamental nature of moving images. This prompts contemplation regarding the permissible and achievable interventions with media technologies, questioning where and in what manner they can be applied.

I initially embarked on my exploration with various image technologies, encompassing photography, video, film, and computing, drawn to smaller formats due to their accessibility. The internet became a location for collectors and enthusiasts to trade media technologies, and this in the digital realm significantly enriched my passion for technology and provided access to items that would have otherwise remained out of reach, alongside enthusiasts' know-how. The interconnected nature of these technologies has been pivotal in sustaining my inquiry. The realm of small technologies and open source has allowed me to prototype ideas and reflect on practices quickly; this goes from depth cameras to 360 cameras, and brings the sense of the media lab to an environment outside of institutions.

The ongoing technological and cultural shifts brought about by digitization continue to influence my perspective deeply. They highlight the essential role of technology in shaping the subjects of research. Additionally, I contemplate utilizing and repurposing diverse materials and mediums as foundational elements for artistic expression. This approach has meant that every novel technology has yielded distinct insights. For instance, the creative aspect of interactivity within computing has facilitated connections between different technologies and materials.

I'm not sure whether precise conceptual distinctions are important for me but, in looking at the overlap of paper and moving-image technologies in my previous research, I am aware that thinking through the concepts of cultural techniques helped me to look differently at how technologies shape and are shaped by subjects, so Bernhard Siegert (2015) (as with Yuriko Furuhata below) in the European context has been helpful, as has Lisa Gitelman's (2014) approach to media history in the North American context.

My friend Claudy Op den Kamp's (2018) work on copyright/intellectual property and reuse has also been very significant to me for considering how reuse plays such an important part in creativity, and how legal aspects can shape distinctions. These distinctions, when I consider film as single screen/cinema, and so on, seem problematic, they seem to be opposable when you consider collective/cooperative approaches. For example, the studio film club associated with Peter Doig reminds me of spaces of communal watching in places like Sierra Leone, or the radical cinema or film groups such as Exploding Cinema in the UK; they utilize all types of technologies of the moving and still image under the umbrella of film. Siegfried Zielinksi's variantology (2006) holds some sway for me when I consider the various approaches of media archaeology, but when I also reflect on approaches of intersectionality, critical race theory, and transnationalism, then there are other aspects of media, related to Blackness and representation, which add another dimension to what we consider a distinct medium. This summer in the UK, there have been two amazing large exhibitions of the work of Carrie Mae Weems and Isaac Julien, artists from the US and UK. From still to moving image and moving image to still, both artists consider the history of film, photography, video, pre-cinematic moving and still image technologies in the context of the Black experience, the gay experience, the gendered experience. Their installation work brings the viewer into a physical, spiritual, emotional, and intellectual engagement with the content, and the questions of technē, technology, and technique. And so, the works of Fred Moten (2017) and Ramon Amaro (2022) at present are resonating with my own research, the not fixing of the Black experience, and how that impacts our reading of media technologies and their use.

For me, media archives and their shifting use; techniques and technologies; reuse; and artificial intelligence are of current importance because they bring into focus the ethics of the image, the embedding of technologies and techniques, and how race can put instability into relief.

Yuriko Furuhata:

Lately, I have been interested in geoengineering, including technologies of cloud seeding and solar radiation management. In my book *Climatic Media* (2022), I examine the early transpacific history of geoengineering in the 1950s by connecting how the desire to manipulate and engineer indoor and outdoor atmospheres led to various weather modification experiments by scientists, architects, and environmental artists in Japan and the United States. These attempts to control and engineer atmospheric phenomena – including everything from the small scale of laboratory experiments to the large scale of the weaponization of hurricanes during the Vietnam War – were also intimately tied to the development of digital computers on both sides of the Pacific. So current debates on anthropogenic climate change and its devastating planetary effects in the form of extreme weather such as heatwaves, along with the concurrent technophilic propositions such as solar geoengineering, present another moment to reflect on this history. This includes of course its geopolitical backgrounds, which I approach from the critical perspective of media studies and science and technology studies.

In my earlier work on Japanese avant-garde cinema and its intermedial experiments with television and photography, I turned to the question of technology by first thinking about the issue of medium specificity of cinema, which was having its moment in film and media studies. I was curious to find out how this issue of medium specificity was articulated by Japanese filmmakers in the 1960s, as they responded to the "threat" of television as the newest medium that could respond much faster to contemporary events and convey sensations of actuality and liveness. I found it particularly evocative that the timing of the Japanese translation of Walter Benjamin's famous essay "The Work of Art in the Age of Its Technological Reproducibility" in 1965 coincided with the rise of *eizō* (technologically mediated image) as a buzzword within Japanese film and art criticism of the time.

Later, I became interested more in the overlap between histories of science, architecture, and digital computing, which led me to think about more mundane technologies, such as mechanical air-conditioning. In dialogue with other scholars in the fast-growing subfield of environmental media studies, I tried to expand the definition of "media" by turning to the materiality of media infrastructures, such as the energy-intensive data centers that support our daily use of digital media via cloud computing. In particular, I focused on the importance of mechanical air-conditioning as a material support of data centers wherein digital computers are constantly chilled and "pampered" in order to operate in the optimal manner. So, the question

of technology for me became intertwined with questions of the materiality of media infrastructure, architecture, and engineering of indoor climates.

In *Climatic Media* and various articles, I've borrowed German media theorist Bernhard Siegert's take on "cultural techniques" (2015) to talk about architectural techniques such as the engineering of the air, for instance, in the case of so-called "dragon holes" that ventilate high-rise buildings in the tropical island of Hong Kong. There, buildings often feature large holes or gaps in the middle of the building. This architectural feature not only brings about the material effect of ventilation, but it also has the symbolic function of responding to local feng shui lore – the need to circulate auspicious energy, which is usually represented by dragons. This is why they're called dragon holes or dragon gates. So, in spite of the post-structuralist bent to Siegert's theory, I thought it nicely captured the material and symbolic dimension of non-mechanical devices and architectural interfaces that operate as media, such as gates and doors.

Similarly, while I remain critical of the Eurocentrism and the conservative political stance of German philosopher Peter Sloterdijk, I found his argument that modernity is defined by what he calls the "explication of the atmosphere" helpful (2009, 56). His point is that modern technological developments, such as the invention of poison gas and nuclear weapons, revealed and made explicit the hitherto implicit lethal potential of the air to be weaponized, which generated a kind of existential insecurity among modern subjects. I ended up complicating Sloterdijk's argument about the singularity of this modernity centered on Europe, by turning instead to the imperial geopolitics of the Japanese empire and its own technological investment in the modification of atmosphere. But his take on technological modernity was quite useful for me to historicize how the modification of the atmosphere became such a central concern among various groups of engineers, architects, scientists, and artists in Japan.

I've already mentioned the example of feng shui-influenced architectural features of "dragon holes" in Hong Kong, but this example is also linked to my comparative thinking about what John Durham Peters has called "a philosophy of elemental media" (2015). I wanted to think about certain Eurocentric and modern assumptions we may bring to concepts such as "elements" or "environment" in media studies by comparing something like the philosophical tradition of feng shui and its five elemental phases to Greek philosophy's four classical elements of fire, water, earth, and air. But my point was not about advocating for an "Eastern" philosophy of elements, since there is no such thing as a unified or continuous mode of thinking. That said, it was a way for me to articulate the genealogy of concepts and

metaphors that we mobilize within media studies. In my work, I also traced parallel discourses of "media ecology" in Japan and North America, and how the concept of ecology borrowed from science has entered humanities and social sciences. In this regard I'm very Foucauldian. I like to historicize the paths that certain concepts such as "ecology," "elements," and "environment" took before they became naturalized in the present, and incorporated in our discussions about media. Because I work primarily with Japanese archival materials, I try to show the convergence and divergence of these paths as part of media histories.

The question of geopolitics is central to my own research, as I often reflect on the colonial legacies and reality of Japan as a former non-Western empire and as an ongoing settler colonial state. I consider my current work to be part of environmental media studies and environmental humanities in general and, in my recent work on the transpacific media history of geosciences and the anthropogenic markers of the Anthropocene, I build on the work of scholars engaging in critical race theory, feminist STS, Indigenous and Pacific Island Studies, as well as transpacific and archipelagic studies. I'm interested in rethinking the problematic figure of "anthropos" at the center of the Anthropocene in relation to the development of scientific modes of seeing and visualizing the "deep time" of Earth's geologic history, and how they intersect with the territorial expansions of Japan and the United States as archipelagic empires in the Pacific during the twentieth century. Ultimately, in my view, questions of media and technology are inseparable from geopolitical conflicts, colonial histories, and climatic conditions.

Tom Gunning:
I have trouble with the term – and the concept – "new" media. It always smacks of an advertising campaign or a dean's fundraising letter. (My friend Noël Carroll once pointed out to me the oxymoron of an advertisement for a "new improved" version of an established cleanser: "Brand New Old Dutch Cleanser.") However, the issue of novelty, innovation – and, indeed, *invention* (which is I think the proper term here), if more than rhetorical – is crucial to understanding the history of media and technology. My point of reference would be a quote from André Bazin from his 1946 essay, "The Myth of Total Cinema," "In short, cinema has not yet been invented!" (1967, 21). I interpret this not as a call for cinema's (or broadly speaking, the technology of the moving image's) aspiration to total realism, but as indicating cinema's inherently open technical nature. Here I follow Gilbert Simondon: "Invention is the taking charge of the system of actuality through the system of virtualities" (2017, 61). Technic must

Fig. 2.1: "Brand New Old Dutch Cleanser."

be understood as keeping open and actualizing possibilities. Technics of media are in a constant process of renewal, not through progressive stages of perfection of a specific goal, but a process of virtualities becoming concrete. The goal of media history and theory must be to discover the novelty inherent in media history and within each device, whether the camera obscura, magic lantern, 3D projection, digital video, or sound cinema.

My thinking is provoked by Martin Heidegger's 1954 essay, "The Question Concerning Technology" (1977b). Heidegger asserts an essential relation between *technē* and *poiēsis*, understanding *technē* not simply as a means to an end, but as a process of revealing (*poiēsis*). However, Heidegger sees "modern technology" as betraying this understanding, becoming instead a "setting upon," a challenging of nature to fulfill operational demands, embodied especially in the concept of *Ge-stell*, "enframing." I see cinema and motion pictures as the technological art par excellence, and framing

would seem to be at its center. Although Heidegger's comments on film are sparse, his 1959 essay "Dialogue on Language" contains a curious discussion of Akira Kurosawa's Rashomon (1950) posed by his Japanese interlocutor, Tezuka Tomio:

> Regardless of what the aesthetic quality of a Japanese film may turn out to be, 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 objectness. The photographic objectification is already a consequence of the ever wider outreach of Europeanization. (Heidegger 1971, 17)

This description would seem to condemn cinema as a tool of modern technology, as enframing, and therefore cutting off film from the possibilities of *poiēsis*. However, "The Question Concerning Technology" avoids a reductive view of technology. The enframing that aspires to ordering everything as available to human use does pose a danger; but Heidegger quotes the poet Hölderlin, "But where danger is, grows / The saving power also" (quoted in Heidegger 1977b, 28). Modern technology, Heidegger claims, brings not only the danger of setting upon the whole world as devised for human use, but also the possibility of *technē* as revealing – as *poiēsis* – something beyond mere human instrumental use. I believe the technological moving image becomes one place where this struggle takes place. Can the moving and projected image offer an encounter between technology and aesthetics?

Wanting to avoid both a mechanical course of progress in media and a reactionary conservatism, I will violate chronology by evoking a relation between *technē* and magic. In his classic anthropological essay, "Magic, Science and Religion," Bronisław Malinowski demonstrated that traditional societies depended on a complex weave between systems of specialist knowledge – tools and techniques (i.e., technology) – and practices of magic. Thus, the rather complex process of constructing outrigger canoes among the Trobriand Islanders employs complex technology, but interweaves it with magical procedures:

> But even with all their systematic knowledge, methodically applied, they are still at the mercy of powerful and incalculable tides, sudden gales during the monsoon season and unknown reefs. And here comes in their magic, performed over the canoe during its construction, carried out at the beginning and in the course of expeditions and resorted to in moments of real danger. (Malinowski 1948, 30)

Both systematic techniques and magic may be seen as means of control over nature; magic recognizes limits to technic and supplements it by *other means.* This traditional society acknowledges powers beyond rational prediction, and plunges into a logic of images, metaphors, and analogies. It is here I would claim that Heidegger's understanding of *technē* as *poiēsis* appears. It acknowledges the vagaries of the world rather than simply asserting dominance over them, and participates in these unpredictable energies and events through an invocation of analogies through spell and rituals.

Gilbert Simondon's understanding of the technical, expounded in his 1958 book, *On the Mode of Existence of Technical Objects* (2017), posits a magical world view preceding a fundamental split in thinking, which parallels (expresses) the split between the object and the subject which are united in magic. While I have doubts about this schema as an actual historical periodization, the contrast in ideal types seems to me illuminating. The technical, understood not simply as a series of operational devices for the domination of nature, but as the interrelation of what Simondon calls "technical ensembles," while radically different from the fixed system of magic, nonetheless approaches the world as a system of networks. Technic in Simondon's view is not a matter of isolated technical objects, but rather their interrelation within a milieu. The key to the technical, beyond seeing it as a tool in the domination of nature and humanity, lies, then, in its embrace of the virtual, a view of a potential totality. I believe the key to what is commonly called "new media" lies in its fundamental relation to the virtual; in cinema this indicates the possibility of mutability in the image. This corresponds to the concept of information as Simondon takes it from cybernetics: renewal through the unpredictable. Here lies the affinity between the technical and the avant-garde, which explores media's ability (as Simondon puts it) not to copy the world but to extend it.

Jeffrey West Kirkwood:
In the wake of recent consumer-facing evolutions in machine learning and transformer architecture, there's been a perilous sense that humanistic inquiry has been ejected from its most sovereign domain: questions of meaning. The ability of generative AI to probabilistically invent texts that seem to replicate human conventions of writing using large language models (LLMs) based on immense training sets has led to an ostensible victory parade for the most obnoxious forms of positivism. "Not only can the fragile reserve of human language be quantified, it can be technically reproduced!" Hurray. But what techno-triumphalism and humanist dejection alike often seem to ignore is that intelligence (human or otherwise) was always artificial. The

question of both mind and meaning are questions of technics. In what we might refer to as "the revenge of humanism," however, I would argue that technics must be seen foremost as a question of meaning.

This is perhaps a puzzling suggestion from someone who, like me, works in a tradition of German theory, equally misinterpreted, celebrated, and reviled for its "anti-hermeneutic" positions and insistence on a "technological a priori." A brief detour to some older territory of a prioris might help to begin to clarify. In his 1786 text, *Metaphysical Foundations of Natural Science*, Immanuel Kant offered an incendiary assessment of which areas of study could ever hope to be considered sciences (watch out, biology and chemistry, Kant says you're not sciences!). One of the unlucky disciplines to be excluded from the hallowed category was psychology. Kant claimed that the object (the mind) and the subject (also a mind) of observation cannot be adequately differentiated, and additionally, "mathematics is not applicable to the phenomena of inner sense and their laws" (2004, 7). A proper science, which could make a priori claims, would need to have an independent, physical object that it could mathematize. As Kant framed it, a scientific psychology would need "to take the *law of continuity* in the flux of inner changes into account" in a way analogous to how mathematics explains the relationship of the "straight line" to "the whole of geometry" (2004, 7). In other words, a scientific explanation of the psyche had to be externally measurable, and thus discretized, but also able to account for and reproduce the continuities of inner life that were broken down in that same process of measure. This, I would contend, offers a groundwork for understanding the place of technics at the very heart of human meaning-making.

For better or worse, Kant's dismissals were not heeded. The greater part of the nineteenth century, following Johann Friedrich Herbart's landmark 1824 text, *Psychologie als Wissenschaft*, was a riot of attempts to empirically measure the functions of the mind, and philosophy departments even found themselves under siege by experimental psychologists who were beginning to occupy their chair positions in an early prelude to the STEM fields takeover. This was a feat accomplished through the development of machines and, specifically, proto-cinematic instruments like the fall tachistoscope and chronoscope, which delivered and measured the responses to rapid stimuli, dismantling the complexities of inner life into quantifiable intervals between input and output. In my book, *Endless Intervals: Cinema, Psychology, and Semiotechnics around 1900* (2022a), I detail the way that psychology became a science at the point that the mind became a technical object – discretized, operationalized, and sequenced. This was an instance of what Tom Gunning describes in Gilbert Simondon's *On*

the Mode of Existence of Technical Objects (2017) as "virtualities becoming concrete." What nineteenth-century psychophysicists could still not account for, however, was how the concrete could then become virtual, that is, how the line could describe all of geometry, how the discrete could be made continuous, and how purely technical sequences could produce something like the supple forms of meaning that define a mind. As I argue in *Endless Intervals*, it was early cinema and its artful regulation and management of the technical absences central to the experience of moving images that alloyed technics and semiosis.

Already by the late nineteenth century, an aspiration took shape to explain how systems of discrete functions that defined the mind as a machine could signify for a larger unity that was not reducible to the bare stopping and starting of dead mechanisms. As but one instance, Ernst Kapp drew equally on Hegel and the theoretical engineering titan Franz Reuleaux to argue in his remarkable 1877 magnum opus, *Elements of a Philosophy of Technology: On the Evolutionary History of Culture*, that human consciousness, bodily autonomy, and cultural systems of signification all emerged from a dialectical interaction with technologies through a process of what he called "organ projection." In the introduction to the 2018 edition of that volume, my co-editor Leif Weatherby and I showed that not only was the purely operational sense of the German term *Technik* established by Kapp foundational to later understandings of the human that would follow, in work by everyone from Sigmund Freud to Friedrich Kittler to Donna Haraway, but that no conception of human culture or meaning was possible in the absence of technics.

It's not a shocking proposition to someone familiar with the vaguely defined terrain of media theory that technics underlies, or is at the very least inseparably interwoven with, any viable notion of meaning-making. Martin Heidegger, borrowing (or more likely stealing!) the term *Weltbild* from an acrimonious debate between physicists Ernst Mach and Max Planck in 1908 that I describe in the article, "Ernst Mach and the Technological Fact of Counterfactuals" (2018), famously argued that the very coherence of any idea of the world relies on the revelations afforded by period-specific technologies (Heidegger 1977a). Kittler, likewise, placed technical systems epistemically prior to all hermeneutics, and Simondon established that "before the great development of technics, culture incorporated the principal types of technics that give rise to lived experience, in the form of schemas, symbols, qualities, and analogies" (2017, 19-20). There is no before technics, and any imagined realm outside of the regimes of distinction-making it enables is an abyss – undifferentiated, unrecorded, uncommunicated,

meaningless. At the same time, acknowledging the epistemically primary character of technical systems that manufacture, impose, and reproduce distinctions in a universe otherwise lacking difference is not sufficient on its own to account for signification, mind, or meaning. To make technics meaningful rather than a mysterious domain of technological noumena requires an explanation for how the absences instituted by discretized technological operations can signify. It demands a semiotics or, as I explored in *Endless Intervals*, a semiotechnics.

I introduced the term "semiotechnics" to explain how the sequenced stops and starts of psychotechnical mechanisms in the lead-up to the twentieth century also introduced the possibility of something like machine signification, and thus offered a bridge to the computational era. Kittler had already used the term *Semiotechnik* throughout his work, starting as early as his 1978 "Über die Sozialisation Wilhelm Meisters," in *Dichtung als Sozialisationsspiel: Studien zu Goethe und Gottfried Keller* (2013a). Yet, for him the term identified purely semiotic techniques and practices as distinct from technical media. He writes in "Media and Drugs in Pynchon's Second World War," for instance, "When conditions of totalizing semiotechnics prevail, the only real question involves the media they implement" (2013b, 86). The Lacanian strain internal to Kittler's theoretical program did indeed allow him to see within technics the cut-producing function of physical media that was the precondition for semiosis. But his preoccupation was generally with where that happened in the real rather than how the absence produced by those cuts simultaneously signified as such and cascaded into systems of signs bound to technical media. It has been the subsequent generation of theorists of *Kulturtechnik*, and most notably Bernhard Siegert (2015), that has decisively reoriented the study of technics to the indissoluble bond between the symbolic and the technically differentiated real.

The question remains, however, what a bunch of cinematic devices and steampunk psyches have to tell us about technics and meaning in the computational era. You'll not be surprised to hear that I think the answer is "a lot, actually." It's beyond dispute that, as Kittler wrote, "All code operations [...] come down to absolutely local string manipulations, that is, I'm afraid, to signifiers of voltage differences" (2013b, 223). In a linear view of the relationship between hardware and the symbolic, that's definitely true. But we could say that times have changed a bit, and that the exponential proliferation of semiotic differences generated within transformation layers responsible for the new appearance of artificial psychic autonomy now drive voltage differences whose purpose is to pattern, package, and create ever more differences, even sometimes at the expense of meaning. This is

something I have discussed at length in my article "From Work to Proof-of-Work: Meaning and Value after Blockchain" (2022b), which contends that computation has inverted the relationship between value and efficiency that was essential to the industrial era.

What we are witnessing in the technics of machine learning is a negative feedback loop of symbols reinserted into the real, which generates an overabundance of symbols that are transformed and are reinserted into the real. This is, to distort the much-quoted line from Gregory Bateson, *differences that make too many differences* (cf. Bateson 2000, 315). A mind-bending amount of compute and processing power has been put to work on manufacturing symbolic distinctions that will be processed and fed back into language models, which will detect new totally meaningless, but soon to be world-defining distinctions. This is generative surplus we identified in our special issue of *Critical Inquiry* on "Surplus Data" (Halpern et al. 2022). And it represents a financialization of the massive difference-making engine at the core of computational technics that stands to keep the processors hot and the climate even hotter.

Laura Mulvey:
There have been two moments in my life, one in the 1970s and one in the 1990s, when an encounter with a technology changed my thinking about cinema and the direction of my work with it. The first notable moment came about through my encounter with 16mm film in the 1970s. I understand, first of all, that as 16mm had been around since the early 1930s, it was far from "new" in the 70s; and that for many theorists of technology 16mm cameras, projectors, and so on, are simply smaller versions of 35mm and would thus also fail to qualify as "new." But, I am suggesting here, once discovered by artists, radical documentary groups, etc., and especially once enhanced by sync sound in the 1960s, 16mm "afforded" a *technē* that brought an alternative film world into being. Might a technology, perhaps, be endowed with newness, with novelty, when adapted for innovative aesthetic or political purposes?

The idea of 16mm as a facilitator for a new kind of filmmaking began to arrive in the UK from the US and Europe in the late 1960s and early 1970s. In my essay "Visual Pleasure and Narrative Cinema" (1975), as a counterpoint to my critique of Hollywood, I noted that a new women's cinema had begun to emerge, specifically enabled, liberated even, by 16mm. The feminist avant-garde movement had and still has special importance for me personally, but many other innovative, experimental, and radical strands of filmmaking emerged around the same time due to this lighter, cheaper, more accessible

gauge. Tom Gunning mentions, in the last line of his statement, "the affinity between the technical and the avant-garde, which explores media's ability [...] not to copy the world but to extend it." For a short period of time, a conscious attempt was concentrated around this technology to extend a vision and understanding of the world and also to change it.

To expand on this point: at least for this movement, 16mm technology was never simply instrumental. A unifying commitment (across a wide range: artists, socialist collectives, new narrative, etc.) was to the specificity of the medium: to reflect on and to foreground film's materiality. When I look back, specificity and materiality included all aspects of film technology (camera, film strip, processing, editing, projection, to name only the most obvious). In this sense, the 16mm-driven movement used its technological infrastructure to reflect on: (a) process, how the film image comes into being, and (b) how process might affect the coming into being of meaning. This was where its technological self-reflexivity primarily lay.

We were slightly wary of the term "technology" in those days, anxious to avoid any hint of technological determinism. The emphasis was rather on ideology's contribution to the subject's positioning within dominant, industrial film. The terms "specificity" and "materiality," on the other hand, had associations with modernity and with Marxism.

A final personal note on this: 16mm technology, and the milieu that grew up around it in the 1970s UK, enabled my move and my collaborator Peter Wollen's move away from writing about film theoretically and into making theoretical films. I'll try to apply the terms offered by this volume. For Peter and me, 16mm constituted a *technē*, a conceptual vocabulary, as it were, in which imagination and technology constantly informed each other. Furthermore, our films, especially our early, more theoretical ones, could only actually have been realized by the extraordinary skill of our cinematographer, Diane Tammes, and her mastery of the extremely difficult "techniques" involved, for instance, in executing complicated and extended 360-degree pans. "Technique" might be used simply to evoke procedure. But in Diane's case, vision and a commitment to experiment, pushing the technology to its limits of possibility, so enhanced basic procedural skills that the term "technique" returns once again to *technē*.

If that first 1970s moment involved shared principles, a sense of community and collaborative work, my second moment was much more isolated. It came about in the mid-1990s when I began to view films, made on celluloid, on digital devices. It was an experience of making strange, which confused habits of thought and reconfigured the familiar into "something else." And out of this dialogue between old and new technologies, as it were,

different and unexpected ways of understanding film and film history seemed to open up. It revolved around individual, speculative spectatorship as I experimented, on my own, with new ways of watching, on DVDs, films that had been shot on celluloid. The new technology, these experiences, completely transformed my understanding of film spectatorship and ultimately led to my 2006 book *Death 24x a Second: Stillness and the Moving Image.* The ridiculously simple digital remote control gave me, the spectator, an unprecedented interaction and interplay with, as it seemed, the cinema itself. I could still the moving image and then bring stillness back into motion, a fusion of the Medusa's and Pygmalion's powers over the human figure. These powers over stillness and movement conjured up for me (anachronistically, of course) the mysterious and contradictory technology at the cinema's heart: the enigmatic relation between the stillness of the film strip's individual frames and the illusion of movement produced by a projector.

This kind of fascination with film's materiality led, this time, to paradox, uncertainty, and ultimately to the uncanny – a specific "affect" that I came to associate with celluloid as a medium. Although film historians tend to reject the idea that cinema was abruptly "born" in 1895, I began to think that – perhaps – something technologically unprecedented haunted that moment, never achieved before, and which now, in another technological age, would quite rapidly disappear. In spite of its precedents, its proto-cinematic experiments, it was only celluloid film and its projection that fused the photograph's capture of reality with the optical illusion that brought stillness (inorganic, inanimate) to life (deceptively organic, animate). For me, this fusion was redolent of the uncanny that Freud associated with the psyche's anxieties about uncertain boundaries between the living and the dead, and that Jentsch associated with the shudder at confusions between lifelike automata and living human beings.

By and large, my experiments with new forms of spectatorship took me toward a preoccupation with images of time, ways in which film has a privileged relation to temporality, and ways in which digital tools could make these material and aesthetic attributes visible, even tangible. Furthermore, the wholeness of particular movies could easily be fragmented into highly charged moments, emotionally compelling scenes, and so on. New kinds of critical, scholarly, and cinephile "writings" emerged out of these novel technical possibilities, leading to the development of the innovative genre of the "video essay." It was in this context that I first came across the concept "affordance." The idea that a new technology could "afford" something new to a culture, rather than determining it, opened up ways of thinking much more

dialectically between the two. Technology could, indeed, be transformative but the framework of intellectual and political initiatives – even desires and dreams – was also expanding, adding complexities and new, unexpected ways of thinking.

I find it difficult to still think within this dialectical framework nowadays, as the really NEW new technologies march forward. This is, obviously, a cliché at a moment when the Anthropocene age may be accelerating into crisis. But the new technologies looming over the future are particularly hard for someone of my age to conceptualize. Born in 1941, I sympathize with ordinary people who, several centuries ago, had to try to "think" the earth's movement around the sun. I am reminded of Jean-Louis Comolli's evocation of the first impact of the machines of the visible: "Decentered, in panic, thrown into confusion by all this new magic of the visible, the human eye finds itself affected with a series of limits and doubts" (2015, 285). For me, the specter of technological determinism returns, not as a concept but as a historical force. I have tried to pin down the difficulty of conceptualizing contemporary visual media and communication into three points, summing up "limits and doubts," as they move beyond the human eye to the human mind: scale (the mass-on-mass of images stored in cyber-space), instantaneity (the speed with which images and communications are made and exchanged, their hyper-acceleration), and dematerialization (the invisibility of creative and communicative processes). All these stumbling blocks culminate with the particular difficulty of grasping the theoretical and practical implications of AI.

These kinds of issues demand innovative ideas and revolutionary thinking that, probably, only younger generations of scholars and intellectuals can conjure up, and are evoked by the discussions collected here on AI, for instance. But the discussions also intimate that the history of film theory and film aesthetics can still offer this new world traditions and precedents – if only imaginatively and allegorically.

Jean-Christophe Plantin:
The problem for me is that there are too many new technologies all the time! Since I study digital platforms and tech companies, I am often asked for an opinion about the latest thing in town – ChatGPT, AI, Metaverse, and so on. I genuinely do not have an opinion on any of these, simply because I need plenty of time to think about it. I actually became a researcher to be able to pause reality and to take some distance, to analyze it, and so forth, as opposed to, say, a journalist. While I am indebted in my work to great thinkers such as Judy Wajcman (2014), Sarah Sharma (2014), and Nicole

Starosielski (2015), who all have in their own work debunked the myth of a general acceleration of technology to emphasize instead the social construction (and multiple mediations) of time, my first reaction every time is that technology always comes too fast and too often. I like to be very late with new technology.

That being said, I have spent quite a bit of time recently thinking about the concept of infrastructure, and trying to flesh out why the concept is interesting to contemporary technical objects such as data and platforms. While I am very wary of describing everything as infrastructure, as it can dilute the strength of the concept, I still think that it has many things to bring. A first one is the emphasis on the material basis of media. Following John Durham Peters (2015), Lisa Parks (Parks, Velkova, and De Ridder 2023), and many others, I currently study how tech giants (Amazon, Meta, Google, etc.) are changing the material basis of the internet (by designing their own data centers or subsea cables) and what this means for our everyday digital lives. Infrastructure is not just literal here ("networking infrastructure"); using it as an analytical concept allows me to flesh out the imaginary of these technological changes, and their implications in terms of space, standards, or temporality. Another example of the relevance of the concept is that it invites us to look at who provides the labor of maintenance of media technology, instead of for whose benefit. I did some ethnographic fieldwork in a data archive in the US a few years ago, and this focus on invisible labor in infrastructure (following STS-feminist thinkers such as Susan Leigh Star [Bowker and Star 1999] or Maria Puig de la Bellacasa [2017]) led me to reveal the key contribution of data processors who effectively "clean" the datasets they receive to make them reusable by others. While their job is crucial to data and knowledge circulation, their work is not acknowledged – neither well rewarded nor felt as rewarding. These are two examples of the relevance of this perspective.

I arrived only reluctantly – and almost by accident – to the study of digital technologies. My background was in sociology, then philosophy with a strong focus on post-structuralist theories. I became fascinated, like many others at the time, by the concept of rhizome and other forms of spatial thinking, geophilosophy, and so on. At the center of this interest was the concept of cartography, and in a Master's dissertation I even inquired what Foucault and Deleuze had to say about this concept. I wanted to continue this reflection at the Department of Philosophy at Université Paris 8 (the cradle of "French theory"), but the department … lost my application. In the meantime, I realized that much of my interest in cartography had a fantastic online existence and was empirically fascinating, and I decided to study participatory cartography online instead. The Department of

Communication Studies at the same university thankfully did not lose my application (!), and I studied the topic there. But, in the end, I only study technology as a proxy for other things, such as how people use media to challenge a political status quo, how platforms exploit and commodify ever-greater forms of life, and so forth.

Much of my conceptualization of technology is directly influenced by graduate school readings: the early Bernard Stiegler (2018), André Leroi-Gourhan (2022), and Gilbert Simondon (2017). The first two authors led me to think of technology not as a tool but as something inherently constitutive of the social world, and to put it within a longer historical context. Simondon goes further and highlights the relational nature of technologies, and the necessity to constantly think of the relations of dependence, attraction, and repulsion, which technologies develop in relation to their social and technical contexts. He was also a philosopher who was not afraid of long technical descriptions which I (painfully) admire. When it comes down to the social impact of digital technologies, this is a combined perspective that I find crucial in order to go beyond the focus on recent or discrete pieces of technology.

When it comes to method, I am actually going the opposite route. I started my research career by using recent forms of network analysis to study online environments (revolving around the work of Richard Rogers [2019] and others at the University of Amsterdam). I still study mostly online, or at least digital objects, but I now almost exclusively use traditional methods, such as text analysis, participatory observations, and interviews. I get so much pleasure collecting data in this less mediated way! I especially enjoy interviewing people: I have fond memories of the interactions that I have had via interviews, and think about them very often.

The two bodies of work that matter the most to me right now to talk about this are those engaging with social and environmental justice. When I ask in my work how networking infrastructure is reproducing a global division of power and an exclusion/exploitation of minorities, then my influences will be (among many) Ruha Benjamin (2019), Safiya Noble (2018), André Brock (2020), or Charlton McIlwain (2020). When I think about how to include the struggle for just environmental futures within infrastructures, the works of (among many) Nicole Starosielski (2015) on subsea cables, Jennifer Gabrys (2016) and Max Liboiron (2021) on waste, Anne Pasek (2019), Patrick Bresnihan and Patrick Brodie (2023) and Mél Hogan (2023) on data centers, and Rahul Mukherjee (2023) on electromagnetic vibrations, are crucial. These are the two bodies of work, already taken up by brilliant researchers, that I think matter the most right now.

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PART II

Philosophies of Technology

3. Machine Aesthetics: Animation through Technology, Animation of Technology

Gertrud Koch

Abstract

Framed around twenty-first-century anxieties regarding automation and artificial intelligence, this chapter argues for moving beyond the dualism of humans and technology in favor of a consideration of aesthetic dealings with machines and technology. Koch considers the visual appeal of machines from the nineteenth century onward, as well as the human body as the interface of communication with technology. In the process, Koch offers the possibility of a discourse centered less on human obsolescence than on a human-machine dialectic, whether revealing the productive or the destructive side of technology. The chapter considers a variety of examples from political economy, philosophy of technology, literature, film, and contemporary art, all of which invite a reassessment of human-machine interrelation.

Keywords: machines, philosophy of technology, automation, labor, techno-aesthetics, animation

Open the newspaper in the morning, and it's easy to feel transported back 150 years: the machines are coming for us! More fearsome still than humankind, they vie for its questionable legacy. The destruction of nature by the human is mirrored in the continued destruction of its technologically extended revenant. After the natural world, the realms of human experience, of culture are now up for reshuffling. Asceticism, abstinence, renunciation of the drug of technology that hijacks everyday life – such are the pressing recommendations to self-optimize, above all in those domains where technological

media have infiltrated human communication. Under the flippant title "Cell-Phone Bill," the leading editorial of the *Frankfurter Allgemeine Zeitung* warns that there is "no ideology, no drug that controls us more" than that "most totalitarian product of human history," the "mobile phone." It argues for the "state to restrict surfing time," since "otherwise, we will simply burn away, each day a little more" (Strauss 2018, 9). The satirical undertones of the editorial do not blunt the urgency of its call for solutions in our dealings with technology. One writer for "The Week in Tech" in *The New York Times* reports on new insights into the question "Are Robots Coming for Your Job?" and furnishes a prompt answer: "Probably." The bogeyman looming on the horizon is "Artificial Intelligence": "Forecasts of technology's impact on jobs run the spectrum from apocalyptic to sanguine, depending largely on the pace of progress in artificial intelligence" (Lohr 2018, B5). Only the future can tell at what point we will be "incinerated," replaced once and for all by machines.

Prognoses rapidly take on the features of prophecy: whether dystopian jeremiad, or promise of Messianic arrival, will be decided in the trenches that are being dug here and now. Even the antecedent of the lamenting "we" is contested: is it the species burning away, dissolved by animated technological entities that can construct, faster and smarter, a world to which they are better suited than we? Whoever takes seriously this Social Darwinist variation on the theme might see it so. But those who place stock in current theories of evolution, which have long since shed the particular assumptions of the nineteenth century, will not be so easily fobbed off with this simple paradigm of displacement. Confusing about this dystopian blueprint is that agents are again situated in the domain of human activity that was previously declared scorched earth and no longer within human reach. In beginning to think anew how we engage with technology, these increasingly complicated interdisciplinary discourses are in the process of shifting the very nature of our relationship to it.

"Freedom" through Automation

The age of machinery in the nineteenth century was accompanied by a notion of machines that intertwined themselves with human bodies: the hand, the powerful arm of the worker, would in the end be seized by the machine and rendered its appendage. Man and machine would morph to a single cog in the capitalist gears of production. Andrew Ure describes in detail this merger of bodies and machines into an automaton that moves

on its own, and thus becomes a version of the "unmoved mover," unsteered by a higher power. Ure's treatise, *The Philosophy of Manufactures* (1835), is one of numerous sources quoted by Marx in his "Fragment on Machines" in *Foundations of the Critique of Political Economy*:

> The term *Factory*, in technology, designates the combined operation of many orders of work-people, adult and young, in tending with assiduous skill a system of productive machines continuously impelled by a central power. [...] this title, in its strictest sense, involves the idea of a vast automaton, composed of various mechanical and intellectual organs, acting in uninterrupted concert for the production of a common object, all of them being subordinated to a self-regulated moving force. (Ure 1835, 13-14)

The inner logic of the automaton is, however, not that of the machine itself, nor the live labor of organisms blessed with hand and brain, but the economic capital that it sets in motion. The automaton merges into a "Machine God," a "machina ex Deus capitalis."

Marx's "Fragment on Machines" describes this effect of the automaton upon production: just as more is produced with the help of the machine, the time freed from labor grows in proportion, with each defined increasingly relative to the other: "It [capital] is thus, despite itself, instrumental in creating the means of social disposable time, in order to reduce labour time for the whole society to a diminishing minimum, and thus to free everyone's time for their own development" (Marx [1857-1858] 1993, 708). This inner dialectic of the compression and simultaneous freeing of labor time through automation leads to a reassessment:

> on one side, necessary labour time will be measured by the needs of the social individual, and, on the other, the development of the power of social production will grow so rapidly that, even though production is now calculated for the wealth of all, *disposable time* will grow for all. For real wealth is the developed productive power of all individuals. The measure of wealth is then not any longer, in any way, labour time, but rather disposable time. *Labour time as the measure of value* posits wealth itself as founded on poverty, and disposable time as existing *in and because of the antithesis to surplus labour time*; or, the positing of an individual's entire time as labour time, and his degradation therefore to mere worker, subsumption under labour. (Marx [1857-1858] 1993, 708)

Given the conditions of work in "large industry," the productive power of the machine and labor are weighted equally, so that the resulting wealth is based not only on the hourly output of the machine and worker, but instead on the sum of all the labor of engineers, planners, designers, craftsmen, scientists, and artists, whose ideas, inventions, discoveries, and trials gave rise to such a possibility. Accordingly, Marx writes,

> As the basis on which large industry rests, the appropriation of alien labour time, ceases, with its development, to make up or to create wealth, so does *direct labour* as such cease to be the basis of production, since, in one respect, it is transformed more into a supervisory and regulatory activity; but then also because the product ceases to be the product of isolated direct labour, and the *combination* of social activity appears, rather, as the producer. ([1857-1858] 1993, 709)

Already at the outset of the nineteenth century, early socialists had pointed out the curious inversion that occurs with automation: as work time intensifies and accumulates with no benefit to the worker, the share of labor shrinks, so that they must work more in order to reproduce themselves. Leaving aside the theory of value as applied to labor time, Marx's analysis isn't half bad as a description of current phenomena, the true ramifications of which can be observed each day across various realms of life and labor. The diminishing of hard industry jobs in the course of automation gives rise to a proliferation of low-income ones. It leads away from manual labor at the assembly line to the visual monitoring of control units and the quality control of end products, which have to do only indirectly with their physical production; the production process itself is monitored at a computerized control system. "Hard" and "dirty" manual labor is withdrawn from the field of vision by offshoring to other continents, where labor is still cheap, its optimization via automation as yet unprofitable.

Meanwhile, in the realm of leisure, genres of TV have emerged and established themselves, from the US to private broadcasters in Europe – genres that do little more than paint the lives of the rich and superrich as an eternal Sunday, replete with machines of leisure, including vintage cars, yachts, and tech-augmented villas. These are entertainment media with no purpose other than to produce diversions for free time. Wealth is presented merely as the freedom from work and needs; the work that undergirds it no longer exists. The world of TV shows thus replicates the split between labor and leisure time, as it is itself a work machine, an automaton, that capitalizes the leisure time of others into productive labor time. Insofar as

this free time is thought of exclusively in relation to work time, it remains a kind of negative freedom: freedom *from* work. How to categorize this idea of available time under a more comprehensive notion of free time that is a freedom *to* something, is left to our aesthetic dealings with machines and technology – this is the thesis I wish to elaborate here. Only then is a techno-aesthetic possible, one that escapes the Social Darwinist duality of either technology or "us."

Saturnalia of the Machine

It is easy to forget that already in the nineteenth century machines held visual appeal. During recreational excursions to factories, tourists would marvel at the "great machinery," but certainly not the workers (Fig. 3.1). Factory paintings of the time, too, like those of Adolph Menzel, focus much less on the work with, and at, the machine, than on the overall ensemble (Fig. 3.2).[1] In one of the first-ever films, the camera shows Auguste Lumière's workers as they leave the factory (which belonged to the Lumière Brothers) – something that would become a generic motif almost immediately (Fig. 3.3). These "factory-gate" films served a double function: they advertised the possibilities of film, but were also systematically operated by showmen who were able, in itinerant screenings, to reproduce the movement of workers departing from the local factory. They could thus advertise the possibility of viewing themselves on the screen, as well as the technical curiosity and novelty of film and its attendant apparatus (cf. Gunning 2004). Films showing the exterior of the factory promised the masses their own representation. The question of "where do the workers go when they leave the factory?" led directly to the movie theater. The dynamic of the intimate bond between factory and the entertainment industry drew upon a new visibility that permitted the viewing of motion – that of machines, and that of an animated world.

Marx had already seen that the inner logic of the machine-model risked its own implosion, as live, human labor shaped itself ever further in the mold

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1   Werner Busch has pointed out that the perspective of an external observer is built into Menzel's depiction: "But in fact that vanishing point in *The Iron Rolling Mill* is very specifically marked—it is the head of the overseer. Though situated far in the background, not only do the foreshortened lines run towards him, he separates himself from the other workers in another aspect. He is clad not in work wear, but in bourgeois street clothes, including a 'bowler hat,' sauntering about the hall with his non-working hands folded behind his back, as the other workers strain and toil away" (Busch 2004, 112).
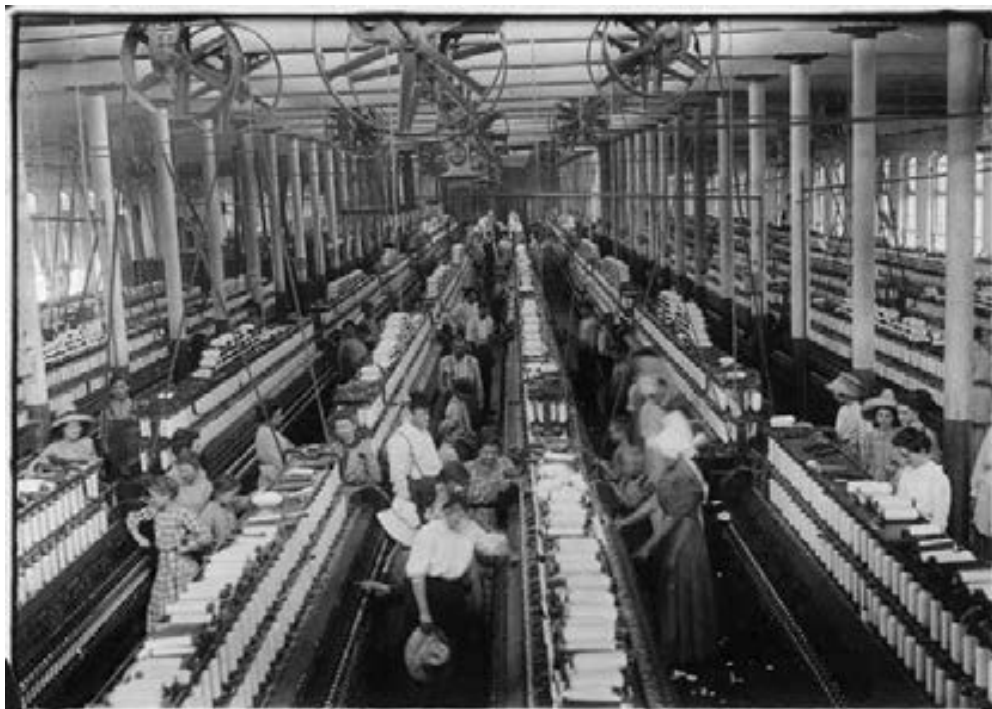
Fig. 3.1: Lewis Hine, *Interior of Magnolia Cotton Mills Spinning Room, Magnolia, Miss.* 1911. U.S. National Archives at College Park.

Fig. 3.2: Adolph Menzel, *The Iron Rolling Mill (Modern Cyclopes)*, 1872-1875. Oil on Canvas, 158 x 254 cm. Alte Nationalgalerie, Berlin.

of the machine, eventually to be driven completely from it. A machine that failed to take into account the value of human labor in its production would spell the end of capitalism: a diagnosis that, in manifold variations, is today pinned on the automation of production via robots. The self-engineered

Fig. 3.3: Louis Lumière, LA SORTIE DE L'USINE LUMIÈRE À LYON [WORKERS LEAVING THE LUMIÈRE FACTORY], 1895. Film still.

obsolescence of humans through the machine would mean the end of a system based upon medial exchange, of time and goods for money.

A good thirty years after Marx's "Fragment on Machines," Friedrich Nietzsche cast the development of the machine as a transmuter of nature in the language of a power struggle. The positive determination of this struggle was potentially the purview of socialism:

> the situation is the same as in the face of a force of nature, for example steam, which is either pressed into service by man as god of the machine, or, if the machine is faulty, if that is to say human calculation in its construction is faulty, blows the machine and man with it to pieces. To solve this question of power one has to know how strong socialism is, with what modification it can still be employed as a mighty lever within the existing play of political forces; under certain circumstances one would even have to do all one could to strengthen it. Whenever a great force exists – even though it be the most dangerous – mankind has to consider how to make of it an instrument for the attainment of its objectives. (Nietzsche 1996, 163-164)

In this passage, Nietzsche insists that a machine-god originates in human conception. Just as Ludwig Feuerbach argues in his *Lectures on the Essence*

of Religion (1851) that God is a human projection, so too, in this case, is the machine-god a geometric and mathematical one, born of humans and fallible like them, defeated by the machine they themselves brought into the world. In this double perspective, the machine appears as a mistake returned to haunt the humans who committed it. Because humans mistakenly projected themselves onto the machine – but also because they subjugated themselves to it – the machine is their undoing. In their dealings with the machine, humans lack *technē*: they cannot operate their own technology, which has slipped from their grasp. Nietzsche makes a clear and significant distinction between machine and *Technik* (cf. Gerhardt 2018).[2] Writing of tragedy, Nietzsche uses the concept of *Technik* in the sense of *technē,* the skill and process for the successful completion of an artistic operation:

> The people really demand of tragedy no more than to be thoroughly moved so as for once to have a good cry; the artist who sees a new tragedy, on the other hand, takes pleasure in the ingenious technical inventions and artifices, in the handling and apportionment of the material, in the new application of old motifs and old ideas. His attitude is the aesthetic attitude to the work of art, that of the creator; the one first described, which pays attention only to the material, is that of the people. (1996, 88-89)

Besides the functional meaning with which it is most often used, *Technik* possesses an aesthetic meaning for Nietzsche: it is the work of the artist, their working through of the material, the stuff with which they go about, that in the end is so closely tied to its technical processing that the "naive" spectator does not know how to distinguish between the material and its physical preparation. *Technik* works concealed within the machine, its interior machinist.

The concept of the machine is mostly used metaphorically, denoting the apparatus – be it the government apparatus or the state apparatus, or even one's own cognitive apparatus. Nietzsche writes in a letter: "When I am ill, I don't know in what sense exactly I am more ill, as the *machine* or as machinist" (Nietzsche 1876). The inseparability of body from will permits him to think of illness as an affliction of the whole person, not just the body; machine and machinist are inextricable. *Technik* is the will implemented by the machine. The concepts are thus in no way interchangeable, but are rather seen as distinct by Nietzsche. This has consequences for a philosophy

2   Translator's note: At times, I have translated the German *Technik* as "technology." In those cases where I felt the word shape-shifted in its signification, I kept the more polysemic *Technik*.

of technology that places the machine in relation to embodied, human faculties of perception – faculties that are deployed when the human body is the interface of communication with technology.

Friedrich Kittler recasts Nietzsche as a media philosopher whose ideas found expression through engagement with a machine. Nearly blind, Nietzsche could no longer write, and acquired one of the first typewriters, a Malling-Hansen Skrivekugle, about which Kittler notes,

> Hans Rasmus Johann Malling Hansen (1835–90), pastor and head of the royal Døvstummeinstitut in Copenhagen, developed his *skrivekugle* / writing ball / *sphère écrivante* out of the observation that his deaf-mute patients' sign language was faster than handwriting. The machine "did not take into account the needs of business" but rather was meant to compensate for the psychological deficiencies. (1999, 202)

From time to time, Nietzsche himself reports on his work at a machine that reveals itself to be sensitive to the weather, and in frequent need of repair: "This machine is delicate, like a small dog, and causes a lot of problems, and some entertainment" (Nietzsche 1882). Perhaps via interaction with a machine that, like a house pet, is enmeshed in direct communication with its owner, another dimension of the machine emerges, one from which its own negation follows. Nietzsche writes thus about less delicate machines:

> The machine is terribly controlling, insists that everything happens at the right time and in the right way. The worker obeys the blind despot, he is more than its slave. The machine does not cultivate the will to self-possession. It arouses an appetite for reacting against the despot – debauchery, folly, intoxication. The machine brings forth Saturnalia. (Nietzsche 1879)

When the workers are no longer merely slaves to the machine, they become its destructive masters and can derail it. If the sensomotoric, organic union with the machine means a deliberate synchronization with time, then the proper time of the individual can be wielded against the machine. They are mutually determined – the human dominates the coded timing of the machine, and the coded machine dominates the worker. In one of the most-viewed yet overlooked silent film sequences, one can see such a Nietzschean Saturnalia. The factory in Charlie Chaplin's Modern Times (1936) is a hierarchical array of machines. Above, the factory head oversees production at a surveillance screen: the rhythmic interplay of organic and

Figs. 3.4-3.5: Charlie Chaplin, MODERN TIMES, 1936. Film stills.

mechanized bodies at a Fordist assembly line, as well as the "free" time during restroom and food breaks that are built into the production process. At the line, Chaplin loses step and is sucked into the machine, later emerging as a dancer (Figs. 3.4-3.5).

This puzzling transformation takes place inside the machine, which instead of dismembering the human body lets it glide gently through the gears, as if the machine had been tailored specifically for it. The visual metaphor on which this shot draws is thus far from Luddite. Instead, an alternate ordering is constructed: the levers of the machine become the total filmic body in Chaplin's choreography, with dancers moving about as if on the musical stage. This transformation is described in an essay by Jean-Louis Comolli as a cinemachine: "[...] through machines, there is play within work, and that it is in the play with this machine par excellence, the cinema, that the boldest venture of Man's share still lies. The work of spectacle can replace the impossible spectacle of work" (Comolli 1998, 24).

The phantom of this dancing transformation, in which ponderous machines and labor are rendered to weightless movements, reveals itself as an animated metaphor of the machinist who sits within the machine and plays with it according to their own whims. The trance-like suspension of rhythmic work and production time is here the dream of a machine with a human at its heart, the director setting the comic performer in motion from within the cinemachine, if one is to follow Comolli, or better still, Chaplin. In this Nietzschean Saturnalia, the relation of man to machine is not antagonistic, but instead conceived as a spectrum of possibilities. The inner machinist is the director of the machine, which in turn brings forth the unmoved mover, who permits himself to be moved about the world of his own invention. Another theorist of machines, Gilbert Simondon, suggested the metaphor of the conductor for this performative union of man and machine:

> Far from being the supervisor of a group of slaves, man is the permanent organizer of a society of technical objects that need him in the same way musicians in an orchestra need the conductor. The conductor can only direct the musicians because he plays the piece the same way they do, as intensely as they all do; he tempers or hurries them, but is also tempered or hurried by them.[3] (Simondon 2017, 17-18)

Machine Dialectics

At a level more abstract than Chaplin is the modern dance theater of William Forsythe, with his recent installation *Black Flags* – a dance piece for robots,

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3   The engineer who was responsible for the interaction of machines was called the conductor.

and part of his series "Choreographic Objects" housed in a grand hall of the Gagosian Gallery in Le Bourget, on the outskirts of Paris. Two industrial robots with enormous black silk flags in their grippers are mounted on a platform and steered by a computer so that the flags flutter in choreographed movement of such breathtaking precision that it could never be matched by a sequence of human movements. What makes these movements so aesthetically fascinating is the mimetic operation that Forsythe, in an interview, tries at once to address and minimize. He points to the machine-like quality of the robots – not to be understood as anthropomorphic – yet at the same time, clearly of two minds, also admits their likeness to arms. The robots are not arms, but in them we see arms: "While conceding that the robots emulate certain human attributes, I also tried to deanthropomorphize their interactions so that they would be perceived more as pure compositional entities. I'm striving to make a formal statement in the way that music hangs in the air" (Forsythe 2017).

The point of departure is human flag waving, which is here executed in a way achievable only by a machine: "Perfection isn't my foremost concern here [...] given the scale of the exercise, the sheer demands of force that the imagination of the choreography requires, with that material on that scale and in that space, is [*sic*] humanly impossible. So with the robots I am providing an augmented human practice" (Forsythe 2017). Forsythe's work lies at the intersection of the externalization of human labor (the dancers' bodies are replaced by robots) and its internalization in the work (the artist/ engineer programs and controls the machine, the computer): "I'm providing an augmented human practice" (Forsythe 2017). In these technologically produced and technologically animated objects, the possibility of a redemptive critique arises – one that brings technology back to the level of a *technē* that recognizes it as human-made and therefore also modifiable. The loosening of an economic interlocking of machines as augmented labor permits one to view them in a new light: they are instruments of an animated imagination that realizes itself materially, and yet remains abstract. Max Weber pointed out that the machine was not simply endowed with the iron fist of industrial production when he wrote:

> The fact that what is called the technological development of modern times has been so largely oriented economically to profit-making is one of the fundamental facts of the history of technology. But however fundamental it has been, this economic orientation has by no means stood alone in shaping the development of technology. In addition, a part has been played by the games and cogitations of impractical ideologists, a

part by other-worldly interests and all sorts of fantasies, a part by preoccupation with artistic problems, and by various other non-economic motives. ([1921-1922] 1978, 67)

I do not wish to suggest a mere historical continuity, in which the relationship of art to instruments, machines, and apparatuses emerges in such a way that contingence and difference recede from view. Lying between the precisely cut pipes of the pan-flute, and the digitally augmented works of Bill Viola or William Forsythe, are spaces determined by other technologies. Art and *Technik* do not face one another in some euphoric gesture of zealous productivity; art often reveals the destructive side of *Technik,* its capacity to harm both the body and its environment. The technical animation of things extends to many dimensions. It can evoke a mimetic return to older ritual practices of scarification, as with Kafka's "In the Penal Colony" (1919), in which a gruesome machine commands sovereign power over the body as it writes it into death. Or the dystopian social fantasy of Fritz Lang's METROPOLIS (1927) and all science-fiction films that followed it.

Playing with the machine gives rise in all cases to unfettered perspectives on *Technik*. The creation of Dadaist machines, whose only function is to generate aesthetic humor and horror, was perfected by Jean Tinguely. In his kinetic sculpture, *Mengele-Dance of Death* (1986), Tinguely calls into being the killing machinery of the National Socialist extermination camps, where Josef Mengele carried out his experiments on the human body. Mengele, the SS doctor, appears in the physical form of mechanical reapers, machines manufactured by his father's Augsburg firm. At a second level, the work presented here, that of the Danse Macabre, evokes rituals of coping with death. This duality lays bare the ambivalence of animation: death is brought to life, the dead commemorated, in a theater of memory that conjures presence from absence. Animated beings die, machines rot and their technical reanimation, in which ostensibly self-propelling machines are transformed into skeletons, turns phantoms of the past into symbols whose very materiality appears threatened by decay; they rust, creak, and groan, thus appearing all the more alive.

In this tradition of a machine dialectic between destruction and production – one from which Tinguely's works emerge – is DER LAUF DER DINGE (THE WAY THINGS GO, 1987) by Peter Fischli and David Weiss, first displayed at Documenta 8 in Kassel. This 16mm film, which was later copied as a video in gallery format, shows a dialectic of destruction and progress as a series of slapstick occurrences in which mundane objects initiate a chain of fires, explosions, and collisions as they move forward (Fig. 3.6). This strictly causal

Fig. 3.6: Peter Fischli and David Weiss, Der Lauf der Dinge [The Way Things Go]. 16mm film (copied to video), 1987. Video still.

succession of events unfolds like a physical experiment gone awry. While the elements of fire, water, and air demonstrate their own materiality as media, the mechanical link unites them as elements of a single machine. Yet this is merely an appearance; the finessing of destruction is not of the natural world, whose causality is pushed *ad absurdum,* but depends instead on techniques of montage and camera positioning that permit the sequence to appear as a continuous movement. In reality, the installation collapses into isolated moments that have no impact on each other. The impression of a perfect machine is in fact a technologically generated illusion: a machine's dream of a machine and its machinist. Comolli summarized this machine-ness of film as its own poetics:

the cinema is, to begin with, a machine that is heir to other machines, haunted and as if fascinated by them. The dialogue of machines. The attraction and seduction that involves the emphasis of plastic and cho-reographic dimensions in the representations of work. The cult of surface and of movement as quintessence of spectacle. Witness the industrial films, the commercials, reportage, the televised news; the length of shots, the careful framing, the flow of tracking shots convey something like a cameraman's delight in filming mechanical tools, cranes, car bodies,

presses – all that moves in the sheen of metal, everything that slides, strikes, rises and falls in the immutable cadence of the metronomic beat. The eroticism of machines is captured to perfection by the cinerotic machine. (1998, 19-20)

The poetics conceived of here would also serve to characterize Tinguely's great kinetic installation *Pit-Stop* (1984), commissioned by Renault, and including not only parts of Formula 1 cars and scrap iron, but also four 16mm film projectors that, quite literally, project onto the walls.

Technik as the Medium of an Interior/Exterior Relation

There are two components to Comolli's argument about film as a space of confrontation with, and over, machines. On the one hand, film attests to the aesthetic dimension of machines that lies in their materiality: the haptic quality of the metal, the sculptural and sonorous effects – rhythmically organized sound – and above all, mobility, that permit them to appear as a *perpetuum mobile.* This metaphor is advanced by Fritz Lang in the opening sequence of METROPOLIS, where the machine is an arrangement of smoke-belching organ pipes (Fig. 3.7). On the other hand, the machine of film sucks the outer machine entirely into a kinetic and sensomotoric flow.

In his 1930 essay "Form and Technology," Ernst Cassirer writes that this double movement, from within and without – which Comolli claims for film – is in fact foundational for the interaction between humans and technology*:*

> This is also true for technological efficacy because it is in no way directed towards the seizing of a mere "outside," but rather it encloses in itself a particular turn inward and backward. Here too it is not about breaking one pole free from another, but rather about both being determined through each other in a new sense. (2012, 37)

In this way, *Technik* is not a mere instrument for the acquisition of raw materials, but a blueprint for one's understanding of the various links in one's world and body. *Technik* as the medium of this Inner/Outer relation is thus not concerned only superficially with art; instead, it is precisely in art that this relation comes to be so central. Art is an unfolding of idiosyncrasies, of playful experiments with, or ones that derail, our own technicity. As I noted earlier, one can think of this relation as a model of work or production. But

Fig. 3.7: Fritz Lang, Metropolis, 1927. Film still.

one can also understand it in terms of anthropology. There is no straight line from organic forms of early human activity to the advanced forms of externalized *Technik,* which in the final stage leaves behind the organic component of the species. In fact, this technological turning outwards is a primal act through which humans (and perhaps also animals) relate to the world. Art dismantles a false dualism, even when it appears to be a pious fetish of all that is technological (Fritz Lang negative, Richard Wagner positive); in it, art orchestrates new machines and instruments, transforming them into their own *Technik.* It is then unmistakable that *Technik,* even if from far above, points toward an inner core bound to will, conscience, or praxis. Ernst Cassirer expressed it in sharp terms:

> If we move from this determination, then it would appear at first that knowledge of the I is tied in a very particular sense to the form of techno-logical doing. The border that separates purely organic efficacy from this technological doing is likewise a sharp and clear demarcating line within the development of I-consciousness and singular "self-knowledge." From the purely physical side, this shows itself in the fact that a determined and clear consciousness of his own body, both a consciousness of his bodily gestalt and his physical functions, first grows in the human being after he turns both of these towards the outside and, so to speak, regains both from the reflection of the outer world. (2012, 37)

Cassirer distinguishes himself from earlier philosophers of technology, like Ernst Kapp, by taking the decisive step away from the anthropocentrism inherent to theories of augmented or extended organs (cf. Kapp [1877] 2018). *Technik* is not merely an extension of the body outwards, but rather a "reflex of the external world" in its consciousness: anthropomorphic, but not anthropocentric. To this, the machines and robots of art react, trying to divest themselves of their human condition, and yearning for autonomy – yet, robots dream human dreams. No less than William Forsythe, the Australian media and performance artist Stelarc must experience the body as an epistemic and sensory medium in order to reveal himself as a machine from elsewhere, like the robots that Forsythe displaced from industry to transplant in an art gallery. Taken as they are, Forsythe says, they are lethal, because they cannot stop working on their own. Like lemmings, they toil incessantly toward their own destruction, until someone switches them off. Their exterior is the animation of the metaphorically extended machinist, by the machinist who animates the very machines that animate us, in order to animate them.

Translated by Ambika Athreya

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About the Author

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4. "New Stars Were Rising in the Sky": On Benjamin's Concept of Cosmic Experience and Technology around 1930

Astrid Deuber-Mankowsky

Abstract

The question concerning technology was, for Walter Benjamin, tied to the First World War. It was the first global and technical war, from which there were infinite technical images, but, according to Benjamin, no communicable experiences. The war technology was, however, only one side of this crisis; the other side consisted of developments in modern physics. Benjamin connected the questions that arose for philosophy from the revolutionization of physics to the overpowering effect of the technical-industrial world war. From there, he came to the conclusion that a coming philosophy must be a philosophy of technology (*Technik*). This thesis will be elaborated in the following chapter, which will conclude with a reading of the aphorism "To the Planetarium," in which Benjamin develops a new form of cosmopolitics: a techno-cosmopolitics.

Keywords: planetarium, techno-cosmopolitics, First World War, crisis of perception, modern physics, second technology

The question concerning technology was, for Walter Benjamin, tied to the First World War. It was the first global and technical war, from which there were infinite technical images but, as Benjamin stated, no communicable experiences. As he forcefully argued, this historically unique situation concerned the possibility of participation in a common world for all. The war technology was, however, only one side of this crisis; the other side consisted of developments in modern physics. Both sides radically challenged

the possibility of the unity of *Anschauung* (perception), as it had been founded by Leibniz with the law of continuity. Benjamin connected the questions that arose for philosophy from the revolutionization of physics to the overpowering effect of the technical-industrial world war. From there, he came to the conclusion that a coming philosophy must be a philosophy of technology (*Technik*). This thesis will be elaborated in the following chapter, which will conclude with a reading of the aphorism "To the Planetarium." In it, Benjamin interprets the technical revolution of his time as a renewal of cosmic experience, or rather as a new world experience, which prepares a new form of cosmopolitics: a techno-cosmopolitics.

One of the Most Monstrous Experiences in Human History

In the short text "Experience and Poverty" (*Erfahrung und Armut*), which appeared on December 7, 1933 in the journal *Die Welt im Wort*,[1] Benjamin describes one of the "most monstrous [*ungeheursten*] experiences in human history"[2] – so monstrous that it shattered the possibility of communicability and, with it, the possibility of experience itself – with a striking image that he also repurposed in the essay "The Storyteller" (1974-1985, 2.2: 439):

> A generation that had been driven to school by horse-drawn streetcars, stood under the open sky in a landscape, in which nothing had remained unchanged but the clouds, and in the middle, in a force field of destructive currents and explosions, the tiny frail human body. (1974-1985, 2.1: 214, 2.2: 439)

The situation of this generation can be described in an image that finds its reference in a technical image but not in a communicable experience. According to Benjamin, people that returned from the battlefield were not "richer, but poorer in communicable experience."

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1   The journal was edited by Willy Haas in Prague for a short period between 1933-1934. In the typescript with the remark *Handexemplar*, the title of Benjamin's article reads "Poverty of Experience" (*Erfahrungsarmut*).

2   Benjamin carefully and systematically distinguishes between two words for experience, *Erfahrung* and *Erlebnis*. The concept of *Erfahrung*, unlike that of *Erlebnis*, is tied to critical engagement with Kantian and neo-Kantian philosophy (Jay 2005, 334). This must also be kept in mind in the following account of Benjamin's philosophy of technology. For an in-depth account of Benjamin's distinction between *Erfahrung* and *Erlebnis*, see Martin Jay's chapter "Lamenting the Crisis of Experience" (2005, 312-343).

Fig. 4.1: Light effect of the flare shells and the seventy-hour artillery barrage that prepared the great French offensive. End of September 1915. Postcard.

The scene that Benjamin uses to describe the soldiers' situation is very precisely chosen: it refers in a subtle but striking way to one of the most quoted passages in modern philosophy: the "Conclusion" of Kant's *Critique of Practical Reason* (1788). It begins with a scene under the open night skies and sums up the "*Weltanschauung* [worldview] in the emphatic sense" from which Benjamin distinguishes his own experience and that of the generation of 1914-1918 (1974-1985, 2.1: 158). Kant's passage describes the human being at the juncture between nature and reason, which still shapes the Western anthropocentric notion of humanity's elevated position in the world today. I will therefore quote the famous passage in its entirety:

> Two things fill the mind with ever new and increasing admiration and reverence, the more often and more steadily one reflects on them: *the starry heavens above me and the moral law within me*. I do not need to search for them and merely conjecture them as though they were veiled in obscurity or in the transcendent region beyond my horizon; I see them before me and connect them immediately with the consciousness of my existence. The first begins from the place I occupy in the external world of sense and extends the connection in which I stand into an unbounded magnitude with worlds upon worlds and systems of systems, and moreover into the unbounded times of their periodic motion, their beginning and their duration. The second begins from my invisible self,

my personality, and presents me in a world which has true infinity but which can be discovered only by the understanding, and I cognize that my connection with that world (and thereby with all those visible worlds as well) is not merely contingent, as in the first case, but universal and necessary. The first view of a countless multitude of worlds annihilates, as it were, my importance as an *animal creature*, which after it has been for a short time provided with vital force (one knows not how) must give back to the planet (a mere speck in the universe) the matter from which it came. The second, on the contrary, infinitely raises my worth as an *intelligence* by my personality, in which the moral law reveals to me a life independent of animality and even of the whole sensible world. (Kant 1996, 192)

Consciousness of human existence results, according to Kant, from the "immediate connection" of two worlds and two infinities: of the skies as a visible, external, extensively endless sensory world, and of the personality as an invisible, internal, intensively endless moral world. Thereby, the universe and nature as the mere animality in humans in their transience are devalued against the universal and intransient world of reason. At the same time, the representative human, insofar as the human is a creature of reason, is raised not only above nature and the earth, but over the whole universe. Kant's creature of reason becomes in a new way the center of the universe, and at the same time, is raised above the universe and the cosmos.

How different was the experience that concerned Benjamin and his generation. The scene described by Benjamin also takes place at night under the open sky. Nonetheless, there is no longer a single, representative human whose sublime feelings are described, but rather human masses, thrown and exposed in the middle of a destructive battle between cosmic powers. In "To the Planetarium," published five years earlier as the last short aphorism in *One-Way Street* (1928), Benjamin formulated the situation of his generation on the battlefields even more drastically and with equally clear reference to Kant's famous text:

Human multitudes, gases, electrical forces were hurled into the open country, high-frequency currents coursed through the landscape, new stars were rising in the sky, aerial space and ocean depths thundered with propellers, and everywhere sacrificial shafts were dug in Mother Earth. This immense wooing of the cosmos was enacted for the first time on a planetary scale – that is, in the spirit of technology. (1974-1985, 4.1: 147)

Benjamin's description presents, in an impressive way, how far apart the cosmic experience of his generation was from the world order that Kant had imagined. The universe in which Benjamin's generation found itself was not quiet and still. It was loud, dynamic, close, dangerous, torn; in the sky, never-before-seen "new stars were rising" (Benjamin 1974-1985, 4.1: 147) that drilled into and made holes in the earth. An unprecedented entanglement – or, as Benjamin calls it, "marriage" (*Vermählung*) – between nature, earth, space, and technology took place. The human was no longer in the center and no longer a juncture; instead, the human was part of a mass, exposed to whatever happened, without being able to grasp or find words for it. For Kant, the "consciousness of my existence" arose directly from the connection between the infinite expanse of the sky above me and the "true infinity" of the moral law within me. Technology now stands between this direct conjuncture between the realm of nature and the realm of reason. Technology now claims its place in this direct connection between reason and nature, which, according to Kant, had defined the essence of man and mankind as the center of the world order. The "spirit of technology" demands, once it is in the world, a new way of thinking about the universe, humanity, and nature, and about time and space.

Thus, the future of the "naked man of the present world" who, according to Benjamin (in another impressive image counteracting Kant's idea of the representative man), "lies crying like a newborn in the dirty diapers of the present," can no longer stand in the succession of generations that emerged from the anthropocentric European worldview of the eighteenth century (1974-1985, 2.2: 216). The poverty of experience, which has come over people with the "monstrous development of technology," is, as Benjamin underscores, poverty "not only of private but of human experience in general" (1974-1985, 2.2: 214).

For Benjamin, the inhumanity of this deadly technical-industrial war did not point to something universally human, to which one could appeal to prevent a new war. The inhumanity of the industrial war was interpreted by Benjamin as a consequence of colonial imperialism and capitalism, which intensified industrialization and the development of technology with the purpose of dominating nature and gaining power and capital on a monstrous scale.[3] Historians of technology today summarize this intensification under

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3   This, as Miriam Bratu Hansen (2012) has persuasively shown in her writings on the actuality of Benjamin's thinking of cinema as a new technology, goes far beyond the often-formulated accusation that Benjamin blamed capitalism for the failure of the integration of technology into a non-anthropocentric relation to the world. For example, Martin Jay put it this way in an interview

the concept of the Second Industrial Revolution. It stands out in contrast to the First Industrial Revolution of the late eighteenth and early nineteenth century "through the development of large-scale technical systems such as electricity, gas, and telegraph factories" (Voskuhl 2017, 30). It included the development of the chemical industry; the construction of civil engineering through the use of steel and concrete; the introduction of assembly-line labor in the car industry; the development of transportation infrastructure and war technology. Modern technology was not a sum of objects. Machines such as tanks, airplanes, cars, guns, film, and photography were components of organized technical systems, and the soldiers of World War I saw the destructive force of these technical systems exposed.

A new planetary war, whose shadows were already looming, as Benjamin correctly foresaw in his 1933 text, "Experience and Poverty," could be fended off, according to his conclusion there, only with a new beginning, in which the relation between technology, humanity, history, and nature is formed anew and differently (1974-1985, 2.1: 219). In order to dissolve the entanglement of technology and the domination of nature, Benjamin broadens the concept of the technical and opens it up for a new beginning, in which technology is no longer associated with war, domination, and destruction, but with happiness and play (cf. Deuber-Mankowsky 2015; Hansen 2005, 2012; Sieber 2019). The magic word for this is "construction": Benjamin took up contemporary approaches to a history of technology to think of technology as a peculiar form of expression and to gauge the potential of this understanding of technology. "Construction is also not mere ratio" is how Siegfried Giedion emphatically begins his study *Building in France, Building in Iron, Building in Ferroconcrete*, which Benjamin had read and praised immediately after its publication in 1928. "We say that art anticipates, but when we are convinced of this indivisibility of the life process, we must add: industry, technology, and construction also anticipate" (Giedion 1995, 87).

with Özgür Yaren after the horrible attack on the French satirical cartoon magazine *Charlie Hebdo*: "As for blaming the failure on capitalism, this too is an empty explanation. Although some people did profiteer, the lust for economic profit was not a powerful cause of the war. In fact, the benefits of capitalist free trade were supposed to make war impossible because it would disrupt the global economy, as of course it did" (Jay 2015, 144). Unlike Jay, I argue that capitalism does not function as "empty explanation" in Benjamin's attempt to integrate technology into a non-anthropocentric thinking. Thus, for Benjamin, the philosophical question of whether the possession of a thing can be just is prior to the question of whether free trade can avoid war, as will be shown below. At the same time, the question of possession and its critique is central to a non-instrumental thinking of technology.

In the second version of "The Work of Art in the Age of Its Technological Reproducibility" (1936), Benjamin introduced the distinction between a "first" and a "second technology." It is certain that the second technology, unlike the first, no longer centers itself around man and, above all, not around human sacrifice: "The technical feat of the first technology" – this is how he phrased it there unambiguously – "is in a sense human sacrifice, that of the second lies along the line of remote-controlled aircrafts, which do not need manning" (Benjamin 1974-1985, 7.1: 359). In the following terse but consequential sentence, Benjamin traced the interweaving of technology and sacrifice back to a temporal order of "once and for all," which rests upon the "vicarious sacrificial death" and the "never to be repaired transgression" of the First World War (1974-1985, 7.1: 359). Indeed, the war's excesses of violence would have been inconceivable without the discourses of sacrifice. They provided the war and dying for the nation with meaning. The disentanglement of technology and war, as Benjamin concluded, presupposes the disentanglement of technology and the logic of sacrifice and thus also an overcoming of the Christian secular order centered around the representative sacrificial death. Instead of the exemplary "once and for all," the second technology follows the temporal index of repetition and "once is never," and thus follows the openness of an ever-new beginning and experimentation.

Experimentation with Fantastic Worlds: Einstein and Kafka

Benjamin connected the commitment to a new beginning with a "positive concept of barbarism" and this with the contemporary revolution in physics and revolutionary movements in art (1974-1985, 2.1: 215). Descartes, who started out with the sole certainty of "I think, therefore I am," serves as a historical example of a "new beginning" (*Vonvornbeginnens*) for Benjamin, in order to construct a new world (1974-1985, 2.1: 215). He saw another similar kind of barbarism in Albert Einstein, "who was not interested in anything else in the whole wide world of physics but a single small discrepancy between Newton's equations and the experiences of astronomy" (Benjamin 1974-1985, 2.1: 215). Benjamin further recognized "new beginners" in the artists, who, like the cubists, started out from mathematics and built the world from stereometric forms or who, like Klee, leaned on engineers. Bertolt Brecht and his epic theater also belong to this positive barbarism, as do the architects Adolf Loos, Le Corbusier, and the Bauhaus school. What connects all of them is that they dare an epistemic and methodological new beginning

in their respective disciplines, and, by doing so, relate to the current state of scientific research and of technology. They by no means reject technology (like the contemporary *Lebensphilosophien*), nor do they aestheticize technology (like Ernst Jünger and the futurists or some of their followers).[4] Rather, they constructively employ the new technical forms and materials (glass, concrete), technical media (photography, film), and natural-scientific and mathematical theories, to experiment with new aesthetic forms. They have to experiment, because it is by no means predictable what the new world will look like. As the most positive example, Benjamin appealed to Paul Scheerbart and his post-anthropocentric science-fiction story *Lesabéndio: An Asteroid Novel* (1913).

Now, just as with the reference to Scheerbart and his *Asteroid Novel*, the reference to Einstein and the revolutionization of physics also runs through Benjamin's thinking on technology.[5] One could almost call these references systematic. In his analysis of the different concepts of "popularization" in Heidegger, Schrödinger, and Benjamin, Peter Fenves (2016) has shown that Benjamin's plea for experimentation with fantastic worlds, in close contact with the revolution in physics, is to be taken seriously – and even more, to be taken literally. In this, Fenves traces Benjamin's reception of the popularization of modern physics by the British astrophysicist Arthur Stanley Eddington. Eddington had studied with Alfred North Whitehead and was in turn interested in the philosophical implications of the theory of relativity. In 1928, Eddington's Gifford Lectures had appeared under the title *The Nature of the Physical World*, which were translated into German in 1930.

For Benjamin, "successful popularization" did not coincide with a simplification of scientific knowledge, as Fenves shows; rather, it brings forth a "Denken – Kant's term would be 'Denkungsart' – that doubtless derives from, but is not defined by a cognitive intention" (2016, 115). This *Denken* cannot itself be considered as an element of scientific knowledge. Successful popularization "propels nonexperts to a point, where they stand together with the scientific avant-garde – a point that is 'decisive' not only in the

4   As early as 1993, Anton Kaes (1993) showed that the differences between Jünger's and Benjamin's approaches to the question of the relationship between war, technology, and violence lay in the weight that both assigned to the political on the one hand and the aesthetic on the other.

5   Cf. Sieber 2019, 3: Benjamin read Scheerbart's novel around 1917-1918, and wrote two *Lesabéndio* critiques (1974-1985, 2.2: 618-620, 6: 147-148) and a French "Note sur Paul Scheerbart." A further work entitled "Der wahre Politiker" from the year 1920 is, as emerges in the letter exchange with Scholem, unfortunately lost (Benjamin 1974-1985, 2.3: 1423). Benjamin also returned to Scheerbart in countless notes on other works, such as his essay on Karl Krauss.

sense that it determines the success of the popularization but also in the sense that it marks a division of the field of research from itself" (Fenves 2016, 115). For only then, as Fenves underscores, can "popularizers prompt their audience to enter a 'Spiel' in which they, for only one moment, and perhaps only once in their lives share standpoint with those who stand precariously at the forefront of knowledge" (2016, 115).

In his famous letter to Gershom Scholem from June 12, 1938, Benjamin compared a long passage from the conclusion of Eddington's book to the world Kafka outlines in prose. In this passage, Eddington describes our everyday movements in the macrocosmic world familiar to us from the perspective of the relations of forces as they prevail in the microcosm, in order to illustrate the difference between modern and classical physics. To give an example quoted by Benjamin: if I "unfortunately" fall through the floor, "this accident is not a violation of the laws of nature, but only an extraordinarily improbable collision of coincidences" (2016, 6: 111). For Benjamin, this similarity between the seemingly fantastical description of the world from the perspective of modern physics and its statistical calculations and the "Kafka-like gesture" was related to the contemporaneity of the big city and modern physics. The modern metropolitan man whose world of experience Kafka describes is, according to Benjamin, at the same time at the mercy of an "incalculable official apparatus" and a "contemporary of today's physicist" (2016, 6: 110).

The scope that Benjamin connected to the problem of popularization is, as Fenves also shows, revealed in the question of the relation between *Anschauung* and knowledge: "Neither the city-dweller nor the contemporary physicist can procure an *Anschauung* of the field of forces governing their respective environments – the micrology of the metropolis in one case, the micro- and macro-cosmos in the other" (Fenves 2016, 117). The problem of popularization thus becomes a matter of "constructing certain images that illuminate events that recede from *Anschaulichkeit* in general" (Fenves 2016, 117). This problem obviously relates to the philosophical problem that Benjamin described in a 1928 curriculum vitae as the "programmatic intent" of his works and, in particular, *Origin of the German Trauerspiel* (1928). This programmatic intent is "to promote the process of the integration of science, which breaks down more and more the rigid partitions between the disciplines, as they characterize the concept of science of the previous century, through an analysis of the artwork that recognizes it as an integral expression of the religious, metaphysical, political, economic tendencies of an epoch, which cannot be restricted to any area" (Benjamin 1974-1985, 6: 219).

On the occasion of a lecture by the paleontologist and representative of a teleological theory of evolution, Edgar Dacqué, Benjamin defended his scientifically (and already at that time easily) attackable remarks that appeared in the *Literarische Welt* of April 12, 1929 with almost the same words. Again, Benjamin referred explicitly to the complex historical conditions of the sciences under examination and their relation to the question of the unity of *Anschauung*:

> The non-biologist may well try, as well as the expert, to give an account of the subterranean connection of forces, which leads to these chains of thoughts. [...] But this integration of fields, which breaks down the barriers of specialized knowledge and specialized thinking, and pushes for unity and continuity of *Anschauung*, stands nevertheless in strict opposition to the traditional form of such unity: the system. [...] Husserl puts the discontinuous phenomenology in place of the idealistic systems; Einstein, in place of infinite, continuous space, the finite, discontinuous one; Dacqué, in place of an infinite, streaming becoming, an always renewed positing of life in limited, countable forms. (1974-1985, 4.1: 536)

This thinking (*Denken*), which does not cease to urge for "unity and continuity of *Anschauung*," even in an era in which the theorem of continuity has been overtaken by physics and a generation (1914-1918) has had one of the "most monstrous experiences of world history," must take up the question of technology as a genuinely philosophical problem: it must be a philosophy of technology.

For this reason, and despite criticism from Adorno (2020, 95), Benjamin held fast to the connection of Kafka's prose to Brecht's epic theater, which represented, in an exemplary way, an aesthetic form at the "cutting edge of technology" and corresponded to the "new technical forms, the cinema as well as the radio" (1974-1985, 2.2: 524). In his 1934 essay on Kafka, Benjamin had described his work as a "codex of gestures [...] that by no means have inherently a secure symbolic meaning for the author, but rather are taken up to make such [meaning] in ever different contexts and experimental arrangements" (1974-1985, 2.2: 418). In his 1938 letter to Scholem regarding Kafka, he referred to his original thoughts on the experimental character of Kafka's writings. Taking up Adorno's criticism that Kafka's prose did not address an audience the way Brecht's theater did, Benjamin now conceded that Kafka lived in a "complementary world." At the same time, however, he held onto the idea that the gestures of Kafka's characters are part of an experimental process. Kafka's work, Benjamin wrote to Scholem, is an

"ellipse whose widely separated foci are determined by mystical experience (which is above all an experience of tradition) on the one hand, by the experience of the modern metropolitan man, on the other" (2016, 6: 110). It is precisely these forces of tradition that make it possible for an individual, not an audience, to make contact with *Dasein*, that is, the reality of the twentieth century:

> The short and long of the matter is that apparently nothing less than the forces of this tradition had to be appealed to, should an individual (whose name was Franz Kafka) be confronted with the reality that projects itself theoretically as ours, e.g., in modern physics, and practically in war technology. (Benjamin 2016, 6: 112)

Subsequently, Benjamin made his statement precise by bringing it into exactly the context that he had already developed in "Experience and Poverty": "I want to say that this reality can hardly be experienced by the individual anymore, and that Kafka's world, often so serene and interwoven with angels, is the exact complement of his epoch, which is preparing to abolish the inhabitants of this planet to a considerable extent" (2016, 6: 112). In his prose, Kafka seeks to make the loss of communicability and the poverty of experience – as an individual – communicable, and, in so doing, he constructs a seemingly fantastic new world. Benjamin connected this world and its construction with the topoi of play and room-for-play and via this path with the second technology: "His [Kafka's] gestures of horror benefit from the glorious room-for-play [*Spielraum*] that catastrophe will not know" (2016, 6: 112). Kafka, according to Benjamin, "tried something entirely new: he gave up truth in order to hold on to transmission [*Tradierbarkeit*], to the hagadic element" (2016, 6: 113). This strength and the will to begin anew connect Kafka with Klee and those "best minds" whose hallmark, according to Benjamin, is "complete lack of illusion about the age and yet a wholehearted commitment to it" (1974-1985, 2.1: 216).

Ephemeral Experience: War Technology and the Crisis of Perception (*Anschauung*)

Benjamin was not the only one who concerned himself with the questions for philosophy that arose from the fundamental crisis of mathematics and the revolutionization of physics. This problem was grasped in the history of philosophy and science as the *Krise der Anschauung* and led

to phenomenology (Husserl), the linguistic turn and analytic philosophy (Wittgenstein), pragmatism toward a New Cosmology (Whitehead), and existentialism (Heidegger). However, in contrast to these thinkers, Benjamin linked the crisis of *Anschauung* to the overpowering effect of the technical-industrial world war and thus to the question of technology.

For Benjamin, the problem of *Anschauung* was connected to the concept of experience in succession to Kant's critical philosophy. Now this concept of experience, as Benjamin (1974-1985, 2.1: 158) tried to prove in his earlier writings, was already too one-sidedly oriented in Kant toward the principles of mathematical physics and the Newtonian concepts of space and time. By contrast, Benjamin demanded that a coming philosophy give a "valid explanation," not only for the "certainty of knowledge, which is permanent," but also for the "question of the dignity of experience, which is transient" (1974-1985, 2.1: 158). In his much-discussed manuscript, "On the Program of the Coming Philosophy," in late 1917, he formulated that every experience is a "singularly temporally limited one" (Benjamin 1974-1985, 2.1: 158). Historicity alone is what all experiences share: every experience is a historical experience. This explains why the "monstrous development of technology" has to be thought through with the crisis of *Anschauung* in the field of mathematics and physics: the "monstrous development of technology" describes one end of the spectrum as "one of the most monstrous experiences in world history"; the denunciation of the validity of the principle of continuity by relativity and quantum physics describes the other end, which encompassed the historical experience of Benjamin's generation. It is in this sense that Benjamin, in his 1938 letter to Scholem, spoke of the reality "that theoretically presents itself as ours, e.g., in modern physics, and is practically projected in war technology" (1974-1985, 2.1: 158).

But if, as Benjamin stated in "Experience and Poverty," the overwhelming effect of the "monstrous development of technology" in war calls the possibility of experience itself into question, then this also puts the existence of philosophy up for discussion. Both hang on the question of whether and how the "poverty of human experience in general" can be thought of as a historical experience, and thus be part of the infinite sum of those "singularly and temporally limited experiences" that in their totality constitute history. This also explains why the questions of tradition and its transmission (*Tradition und Tradierbarkeit*) are so closely linked to the question of technology and the poverty of experience.

Now, according to Benjamin, this historically conditioned singularity of the concept of experience in Kant's theory of knowledge has the consequence that Kant's philosophy itself proves to be historically conditioned and not

different from other mythologies in that respect: "The Kantian 'experience' is in *this* respect, as far as the naive conception of the reception of perceptions is concerned, metaphysics or mythology, and indeed only a modern and religiously particularly unfruitful one" (1974-1985, 2.1: 162). This representation is, "as concerns its truth-value, equivalent to any other myth of cognition [*Erkenntnismythologie*]"; Benjamin mentioned here as an example among others that of the mythology of the "primitive people [*Naturvölker*] of a preanimistic stage" (1974-1985, 2.1: 162). Already in this early text, Benjamin decisively decoupled the concept of experience from the consciousness-philosophical (*bewusstseinsphilosophischen*) representation of the human as the subject of an empirically determinable cognition. As such, Hermann von Helmholtz had already taken this representation, in his interpretation of Kantian philosophy, as the basis of his experimental physiology and psychology (cf. Deuber-Mankowsky 2013).

Nevertheless, Benjamin insisted that every *coming philosophy* must take its starting point from Kant – not from his concept of experience, but from the relation that Kant produced between knowledge and experience, and that Benjamin (here following Hermann Cohen and the Marburg School of Neo-Kantianism) connected with the problem of the "unity and continuity" of experience (1974-1985, 2.1: 162). Philosophy asks, as Benjamin put it in an addendum, "clearly always about knowledge" (1974-1985, 2.1: 170). Furthermore, the *coming philosophy* will ask about knowledge, but, contra Kantian philosophy, it sets itself the task of vouching for the unity of a *transient experience*. It remains a transcendental philosophy and will subsequently, as Benjamin summarizes it, "never encounter, in its questions, a unity of existence [*Daseinseinheit*], but rather always only a new unity of lawfulnesses, whose integral is 'existence'" (1974-1985, 2.1: 170).

This formulation is reminiscent both of the problem of popularization and of the programmatic intention of the *Trauerspiel* book, as well as the "integration of the areas, which tears down the limitations of specialized knowledge and specialized thinking in order to push towards a unity and continuity of *Anschauung*" (Benjamin 1974-1985, 4.1: 536). They show, firstly, that Benjamin held on to a transcendentally constituted concept of philosophy, and, secondly, that the unity of *Anschauung* obviously orients itself on the unity of the endless sum of all "singular, temporally limited" experiences of an epoch: an epoch-experience (*Epochenerfahrung*).This is precisely how "experience" as a "*Weltanschauung* in an emphatic sense" should be understood (Benjamin 1974-1985, 2.1: 158).

Here a number of questions arise. Can technology (*Technik*) be integrated into a transcendental philosophy? Or must philosophy itself become

technical? Must philosophy be transformed, as Benjamin claimed of literature in his text "The Author as Producer," in order to be experiential (*erfahrungshaltig*)? I want to proceed by addressing these questions through a reading of the short and dense aphorism "To the Planetarium," in which Benjamin interprets the technical revolution of his time as a renewal of the cosmic experience – or rather, as a new experience of the cosmos, which demands a new form of cosmopolitanism.

Technical Revolution and Cosmic Experience: "To the Planetarium"

"To the Planetarium" is the very last section of the 1928 volume *One-Way Street.* This short section, and especially the passage quoted earlier in this chapter has been the subject of much controversy among Benjamin scholars. The criticism is mainly related to Benjamin's attempt to redirect and dissolve the violence unleashed in the clash of industrial technology, war, and profiteering within the framework of a new cosmology. Thus, Martin Jay, for example, accused him of a "weakness for the purging powers of violence" (2015, 144). The concerns of Irving Wohlfahrt and others go in a similar direction (Lebovic 2006, 2013; Wohlfahrt 2002). I understand these concerns, but in the following I will try to show that they do not do justice to the radicality of Benjamin's thought: it is not a matter of meeting violence with violence, but of inventing new ways of thinking and concepts to meet the historically new situation with a radical new mode of coexistence of nature, cosmos, and humanity under the sign of technology. In doing so, I agree with Miriam Hansen's attitude to Benjamin's writings. In her detailed and illuminating study of Benjamin's appropriation of Ludwig Klages's theory of perception and image for the concept of "aura," she argued that in the course of this appropriation Benjamin simultaneously "modernized and democratized" Klages (Hansen 2012, 126). Klages, a member of the *Kosmiker* and well-known exponent of the German *Lebensphilosophie*, was anti-modern, critical of monotheism, and anti-Semitic. Nevertheless, Benjamin referred to Klages's speculative theory of images until his death. As early as 1926, Benjamin clearly criticized Klages's "hopeless rejection of the given 'technical' and 'mechanized' state of the world" (1974-1985, 3: 44). And yet Klages's *Of Cosmogonic Eros* (*Vom kosmogonischen Eros*) was an important source for the cosmo-politics developed in "To the Planetarium." But, as I will try to show in the following, there Benjamin also succeeded in appropriating Klages's speculative theory of images to make them fruitful

for a cosmopolitan technopolitics able to provide food for thought, especially in our present situation.

The title "To the Planetarium" refers historically to the great planetariums that were opened, as worldwide firsts, in Wuppertal, Leipzig, Düsseldorf, and Jena in 1926 – that is, exactly at the time when Benjamin wrote this text. They sparked great public interest, were seen as technological wonders, and to this day present landmarks of engineering architecture. Under the closed domes, masses of people gathered together to observe the movements of the starry heavens projected on the ceiling, thereby admiring more the technology than the stars themselves. "To the Planetarium" points, secondly, to the direction toward which a (philosophical) thinking must move if it wants to integrate the avant-garde of modern technology and modern physics in communal living, and not in war and death. The title invokes, thirdly and finally, the history of the connection between astronomy and philosophy, which reaches all the way back to ancient philosophy and which is even invoked by Kant in the above-quoted "Conclusion" of the *Critique of Practical Reason.*

Techno-Cosmopolitics

Against the backdrop of this monstruous and incomprehensible cosmic experience of his generation, Benjamin began "To the Planetarium" with a step behind Kant and the history of modern philosophy, in order to ask about a world-experience that shows the represented entanglement of technics, the earth, and the universe in another light, and contributes to its philosophical cognition. He found this experience described in Ludwig Klages's *Of Cosmogonic Eros* and the investigations of the history of antiquity and of mysteries presented there.

Benjamin was conscious of the anti-Semitism inherent in Klages's neo-pagan *Lebensphilosophie* and critique of monotheism. In 1926, he wrote to Scholem: "An engagement with Bachofen and Klages cannot be avoided – of course, much speaks in favor that this engagement be carried out entirely and stringently from Jewish theology, in whose vicinity these important researchers scent, not for nothing, their mortal enemy" (Benjamin 2016, 3: 110).[6] It is therefore only consistent that the first sentence from "To the

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6   On the occasion of the publication of Klages's *Der Geist als Widersacher der Seele,* he calls the book "regardless of how suspect the author may be [...], without a doubt, a great philosophical work," and adds immediately: "By no means could I have imagined that such an outrageous

Planetarium" begins with a reference to the Jewish scholar Hillel and his interpretation of the Torah:

> If one had to expound the teachings of antiquity with utmost brevity while standing on one leg, as did Hillel that of the Jews, it could only be in this sentence: "The earth will belong to those alone who live from the forces of the cosmos." (Benjamin 1974-1985, 4.1:146)

Hillel lived in the first century BCE. He was the highest judge of the Sanhedrin and is known to have replied to the demand of a non-Jew, "If you teach me the whole Torah while I stand on one leg, I will convert to Judaism," thus: "What is repugnant to you, do that to nobody. That is the whole Torah, everything else is interpretation. Now go and study!"

The sentence "The earth will belong to those alone who live from the forces of the cosmos" suggests that Jewish teachings and the teachings of antiquity have more in common than can be expressed in a single phrase. Thus, the first half – "The earth will belong to those alone [...]" – points to the biblical story of creation and not to Greek antiquity. God, it is said there, gave the earth to humankind to live on it and to shape it. If we follow the reference to Hillel's interpretation of the Torah, the gift of the world obligates us to ethical behavior at the same time. What does antiquity teach us? From the ethical standpoint, which for Benjamin refers to Jewish theology, the teachings of antiquity open up in the following way: antiquity teaches us, firstly, that the earth will not belong to those who declare the possession and division of the earth by the use of force. It further teaches us that property must not be the basis of legality and justice, as Kant stated (Kant 1991, 353-379), and that "mastery of nature" must not be "the meaning of all technology" (Benjamin 1974-1985, 4.1: 147). Antiquity teaches us, thirdly, that attitude that opposes the taking possession of the earth and makes possible a life out of (and not against) the forces of the cosmos. Benjamin describes this attitude as "surrender [*Hingegebenheit*] to a cosmic experience scarcely known to the latter" (1974-1985, 4.1:146), referring here to Klages's description of cosmogonic Eros as a community-building mystical practice (Klages 1922, 40).

To first follow this line of argument, Benjamin connected the decline of this "surrender to a cosmic experience" with the rise of astronomy in the transition from the sixteenth to the seventeenth century, with Kepler, Copernicus, Tycho Brahe, together with the development of optics and the

metaphysical dualism as the one found at the basis of Klages could be unified with really new and far-reaching conceptions" (Benjamin 2016, 3: 537).

invention of the telescope. This rise of astronomy led, as Benjamin noted, (anticipating a media-theoretical insight developed decades later by Marshall McLuhan), to an "exclusive emphasis on a purely optical connection to the universe" (1974-1985, 4.1: 146). The corresponding attitude shows the representative human being as a white European individual, standing, gaze directed at the universe through the optical instruments, dominating it and at the same time keeping it at a distance, looking at the infinity of stars and worlds with awe, sure of his own rational superiority.

The blooming of astronomy, as is by now well-known and sufficiently documented, was connected to all those innovations that made possible the colonization of the "New World" in the early modern era, and colonial imperialism in the second half of the nineteenth century. In order to properly interpret Benjamin's claim, one must keep in mind that the reduction of cosmic experience to an optical connection was "an omen of what was to come" (1974-1985, 4.1: 146). The development toward colonial imperialism, the transatlantic slave trade and techno-industrial war is accompanied by the transformation of the whole world into an object to be owned. This connection, too, is well known by now (cf. Harney and Moten 2022). Benjamin criticized the violence that is accompanied and sanctioned by this position as early as 1916 in a manuscript entitled "Notes Toward a Work on the Category of Justice" (Benjamin 2021, 65-66). In it, against Kant's "Universal Doctrine of Right," he maintained that property and justice are mutually exclusive (Kant 1991, 41-61). While for Kant a thing (*Sache*) is characterized by the fact that it – in contrast to persons – can be used and possessed, and precisely through this very possession-character indeed contributes to the right of reason and the safeguarding of justice, Benjamin began his "Notes" with the sentences:

> To every good, limited as it is by the spatiotemporal order, there accrues a possession-character as the expression of its transience. But possession, as something caught in the same finitude, is always unjust. No order of possession, however articulated, can therefore lead to justice. (2021, 65)

Possession, in the sense of property, and justice are mutually exclusive. We can therefore assume that the sentence "The earth will belong to those alone who live from the forces of the cosmos" does not mean a relationship of ownership to the earth. Benjamin confirmed this when he attributed the reason for the bloody orgy of destruction of the technical war to the "greed for profit of the ruling class" and the "doctrine" of imperialism, according to which "mastery of nature is the meaning of all technology" (1974-1985, 4.1: 147).

To the interpretation of technology as an instrument for the domination of nature, Benjamin opposed a completely new understanding of technology in "To the Planetarium." He introduced it through a comparison with the function that education plays in mediating the passing of generations. Just as the task of education is not the domination of children, but the order and mastery of the relationship between generations, so the task of technology is, as he underscored, not the mastery over nature, but the "mastery of the relationship between nature and humanity" (Benjamin 1974-1985, 4.1: 147). One could then ask whether technology, according to this understanding, is still technic. What is certain is that it introduces a radical new beginning in thinking about the relationship between nature and humanity. In this mediating function, technology changes not only nature, but also humanity (*Menschheit*). Through technology, humanity develops, as Benjamin put it, into its own kind of "species." That means, humanity becomes physical:

> Humans as a species completed their development thousands of years ago; but humanity as a species is just beginning its [development]. For this new humanity a physis organizes itself in technology, in which the contact with the cosmos is formed in a different way than in nations and families. (Benjamin 1974-1985, 4.1: 147)

Through this comparison between the meaning of technology and the meaning of education, Benjamin rewrote the Kantian concept of cosmopolitics into a techno-cosmopolitics, while continuing to maintain an ethical standpoint. Unlike education, technology does not mediate the temporal sequence of generations, which, over a long period of time, stabilized the relationship of difference between humanity and nature. Technology changes this order and enables humanity, which Kant had established as "humanity in one person" and as an address to the rational essence in the human, to transform itself, in the best sense of the word, into a new species with a new physis. This new species, humanity, is a construction. It follows the best of what the surrealist movement had brought forth: it attempts to "win over the forces of intoxication [*Rausch*] for the revolution" (Benjamin 1974-1985, 2.1: 308).

Creative Overcoming of Religious Enlightening

As Benjamin noted in "To the Planetarium," the ancient dealings with the cosmos were played out in ecstatic trance [*Rausch*]. He justified this apodictically with the claim: "After all, ecstatic trance alone is the experience in which

we assure ourselves of the very nearest and the very farthest, and never of one without the other" (Benjamin 1974-1985, 4.1: 146). And he added: "But this means that man can communicate ecstatically [*rauschhaft*] with the cosmos only in community" (1974-1985, 4.1: 146). Benjamin was referring here directly to Klages without, however, naming him. For Klages, ecstasy is the genuine state of the *Eros Kosmogonos*, which he finds mentioned in Hesiod, but integrates quite freely into his *Lebensphilosophie*, following Bachofen's method of intuitive analysis. In contrast to Nietzsche, for instance, who distinguishes Dionysian from Apollonian ecstatic trance, and relates the first to the ear and sound and the second to the eye and image, Klages interprets the ecstatic state of cosmogonic Eros as a mystical experience of ecstasy, of "overflowing, of radiant outpouring, of measureless giving oneself away," in which proximity and distance are also intertwined (1922, 38). For the description of the cosmic experience of antiquity, he reaches back to formulations that are well-known from the history of mysticism: ecstasy, being outside oneself, exuberant happiness.

As Klages emphasizes, however, for him it is not a matter of being "displaced away" (*Weggerücktsein*), but rather about that state of "being outside the I" (1922, 46). Eros is, he expounds, "elementary or cosmic, insofar as the individual being that has been seized by it experiences itself as pulsed through and flooded by a sort of magnetic current, which, similar to thingly magnetism, allows the most distant souls, unconcerned by barriers, to sense each other in a connecting pull" (Klages 1922, 40). Cosmogonic ecstasy is "de-selfing" and it is "sympathetic," contagious and connecting (Klages 1922, 48). Benjamin also assumed that to cosmogonic ecstasy belongs community (*Gemeinsamkeit*), without further comment (Klages 1922, 60). It recedes from the "tangible world of things [...] into the never-to-be-touched world of images" (Klages 1922, 71).

For Klages, cosmogonic ecstasy as a state of being-outside-oneself is connected to a theory of image-space (*Bildraum*), which can be found in Benjamin, just like the idea of ecstasy as cosmic experience. The world of "never-to-be-touched images" is not simply there: it happens, and it is inaccessible to the arbitrary act of perception. To be seized in an ecstatic state has, according to Klages, a polar character; it makes itself concrete in the actuality of images that light up or shine and that occur in "seeing" (*Schauung*) (Klages 1922, 77). The images, which he calls "actual images" (*wirkliche Bilder*) or "impression images" (*Eindrucksbilder*), are fluid, near and at the same time eternally distant, whereas "perception things" (*Wahrnehmungsdinge*) given to the act of perception are there and near (Klages 1922, 95). The intertwining of distance and proximity opens this flowing image-space for an experience of time, which is as far away from Kant's determination of time as a form of inner sense as it is from Kant's

determination of sensation as a quality of empirical representations, and of space as a form of outer sense.

But with that, Klages's model of the flowing interaction of the forms of perception (*Anschauungsformen*) of space and time in the actuality of images provides Benjamin with precisely the opportunity that he had formulated as a task in his "Program of the Coming Philosophy": namely, to establish a broader concept of experience than Kantian philosophy had been capable of. As a genuine experience of being outside oneself, cosmic experience steps beyond the representation of the "individual bodily-spiritual I which receives sensations through the senses and on the basis of which it forms its representations," which Benjamin in the "Program of the Coming Philosophy" called "speculative (i.e., rudimentary) metaphysics" and "knowledge mythology" (1974-1985, 2.1: 161).

Benjamin had made Klages's interpretation of cosmic ecstasy as an intertwining of proximity and distance, of space and time, fruitful, not only for his concept of the aura, which he famously described as a "peculiar web of space and time," a "one-time appearance of a distance, however close it may be" (1974-1985, 7.1: 355; cf. Hansen 2012, 104-132). We find its influence even in "On the Concept of History" (Benjamin 1974-1985, 1.2: 691-707). "Proximity and distance," Klages writes, "are the complementary poles not only of space but just as much of time. We make temporal distance present to ourselves through the visual image [*Anschauungsbildes*] of spatial distance" (1922, 102). While the past lies *behind* us, the future lies *before* us. Because time can only appear in images of what is past (*Bildern des Gewesenen*) and the images are in a constant flow, time appears to us, as Klages elaborates, as a "current, with the direction from the future and *into* the past" (1922, 106, 107). It is not difficult to recognize this representation of time in the image of the angel of history, whose face is turned toward the past and who sees, where "a chain of events appears before *us*, [...] a single catastrophe" (Benjamin 1974-1985, 1.2: 697). And although he would like to linger, he cannot, because a storm is driving him inexorably toward the future, on which he turns his back.

For Benjamin, ecstasy (*Rausch*) is first of all "the experience in which alone we assure ourselves of the very nearest and the very farthest, and never of one without the other" (1974-1985, 4.1: 147). A philosophy of technology can turn to this experience in order to see technology not as an instrument for the mastery of nature, but, as Benjamin suggests, as a medium which, just as education orders the relationship between generations, orders that between humanity and nature. But philosophy can also turn to this experience in order to participate in the construction of a new physis that is in harmony with the new world that modern physics opens in the realm of the microcosmic. In "To the Planetarium," the intertwining of relations of proximity and distance

in cosmic experience is thought by Benjamin to be to such an extent that they dissolve the boundaries between macro- and microcosmos, or at least ensure that the representation, overcome by physics, of objective matter given in space and time as universal experience, is laid down at the basis of knowledge. Much like Whitehead in his new cosmology, Benjamin seeks a standpoint from which the macrocosmic notion of an objective world given in space and time represents only a special case, not the point of reference for all thought. Unlike Whitehead, however, he does not advocate for a speculative philosophy in the sense of an "endeavour to frame a coherent, logical, and necessary system of general ideas in terms of which every element of our experience can be interpreted" (Whitehead [1928] 1977, 3). Rather, Benjamin experimented with a materialist turn in philosophy that encompasses the becoming-technical of philosophy itself. This turn marks also the crucial difference from Klages's metaphysical vitalism. For Benjamin, as he underscores in his essay on surrealism, the "true, creative overcoming of religious enlightening [*Erleuchtung*]" lies "truly not in intoxicants" (1974-1985, 2.1: 297). But neither does it lie in surrendering to the flow of a meaning-giving life (*sinnstiftenden Lebens*). It lies in a "*profane enlightening*, a materialistic, anthropological inspiration to which hashish, opium, and whatever else can provide the preschool." He added: "But a dangerous one. And that of religions is more rigorous" (Benjamin 1974-1985, 2.1: 297).

The task of a philosophy of technology, or of a technical philosophy, is to contribute to the construction of a cosmic order in which the meaning of technology is the mastery of the relationship between humanity and nature, and not the mastery over nature. To this end, it contributes to the construction of an "actual image-space" (*wirklichen Bildraumes*) (Benjamin 1974-1985, 2.1: 309), in which body and image-space penetrate one another to form a new body-space (*Leibraum*) (1974-1985, 2.1: 310). This begins with the philosophical illumination of the congregation at the planetarium, and of the projection of the infinite starry sky onto a dome under which an audience gathers, enthusiastically celebrating the newly constructed, technically penetrated cosmos as a new cosmic experience. It continues with the "experience of speeds [...] thanks to which mankind now prepares itself for unforeseeable journeys into the interior of time, in order to encounter their rhythms on which the sick will strengthen themselves as before on high mountains or on southern seas" (Benjamin 1974-1985, 4.1: 147). In his techno-imaginations, Benjamin thought far ahead and at the same time very close to the Luna Parks as a prefiguration of the "shudders of authentic cosmic experience" (1974-1985, 4.1: 147).

These examples show how philosophy, for its part, can contribute to creating a "glorious room-for-play" (*herrlichen Spielraum*) that, as Benjamin

wrote in his letter to Scholem about Kafka, "will not know catastrophe" (2016, 6: 112).

Translated by Eleonora Antonakaki Giannisi and Bernardo Bárzana

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5. Instructions for Use: Thinking Body, Machine, and Technicity with Simondon

Benoît Turquety

Abstract

What is going on between someone about to become a user and that thing called a camera? How can the user know what to expect from the machine, and how to handle it and care for it? And how can the camera adapt itself to particular situations and intentions? Gilbert Simondon's concept of technicity, which aims at describing the technical knowledge embodied in the machine and in the user's gestures symmetrically, allows one to analyze the common space between body and machine as the place where a relationship both technical and political can take place.

Keywords: cinema, technology, Gilbert Simondon, Bolex, technicity

The Initial Meeting of Object and User

Initial contact with a new technical object may not be technical. The aesthetic dimension predominates first, the one on which marketing has counted to create desire in the potential buyer. This is all the more true for those objects associated with entertainment – and disassociated from technology as such – that are media devices.

Getting closer to the object allows me to establish the first level of a relationship with its technicality or technicity, to use the concept developed by Gilbert Simondon (2017). From a certain proximity, I can begin to apprehend the object from the perspective of its use. I can observe it, spot the buttons, try to decipher the pictograms; the object suggests certain possible modes of interaction between me and it. I can also begin to estimate its

weight, the quality of its materials, and its workmanship. The appreciation of its true scale is more precisely embodied by a direct relationship with my body – it is bigger than I thought or, on the contrary, it will fit easily in my hand. The distance of an arm's length is the moment when I can establish a complete technical link with the object.

Proximity allows me to apprehend all the devices distributed over the surface of the object, to begin to understand the logic of their distribution, and therefore the gestures that will be involved in the various phases of use. I may now be able to turn around the object, if the situation lends itself to this – above all, proximity offers the possibility of manipulation. This may be authorized (I've bought the object, or I've obtained permission to use it), or forbidden (I'm allowed to "touch it with my eyes only"), but the mere possibility of manipulation transforms the relationship I have with it. Manipulable, it becomes technical. If I touch it, I may succeed in making it work properly. Or I may break it.

This anxiety – the apprehension of prehension, if I may put it that way – is specific to the learning phase, and is nodal in the construction of a technical relationship with the machine. It stems in part from the object itself, notably its apparent complexity, but it is also linked to its prestige, and to the social stakes associated with its place and function in the local organization of work. A 35mm camera is a very impressive machine: it is expensive; its mechanisms are delicate; it consumes film that is also expensive; the work of the entire film crew depends on its smooth running; and it is the object of an extremely strong imaginary investment throughout the culture.

This quasi-sacralization of the camera can be seen in the iconography of filming for *fans* and amateurs alike, from Hollywood imagery depicting stars beside their fetish camera to contemporary making-of footage, as well as in the history of film theory. As we know, it was with a critique of this *reduction* of cinema's "basic apparatus" to the machine-camera – a reduction that was all the more blatant for having been left implicit – that Jean-Louis Comolli opened his discussion "Technology and Ideology" in *Cinema against Spectacle*, engaging in a debate with those who, whether condemning or wishing to save the cinema-apparatus as a whole, relied solely on an interpretation of the shooting apparatus (2015, 147-154).

During film production, the camera cannot be radically protected: it has to be touched and manipulated. Its protection is therefore part of the division of labor and professional hierarchy that structure the shoot. Only the cameraperson and their assistant are allowed to touch the camera. The assistant has the explicit task of ensuring that the machine is in perfect working order, from the pre-shoot tests carried out at the time of rental

– since professional cameras are rented, not bought – to the operations of cleaning, loading and unloading the film, and so on. A zone of exclusion is thus created around the camera on the set, doubling the other no-man's-land known as the "field"; that is, the portion of space that will be recorded when the shutter is released, and must therefore be reserved for the characters and set.

This zone of exclusion, which negatively materializes the working space and area of competence of the technical expert in charge of the machine, corresponds exactly to the sphere within which it is possible to enter into a properly technical relationship with the device. This reveals an essential point: technicity is a space. So, if I enter this space, if I devote my attention and curiosity to the object, I enter into this singular relationship that can be defined as technical, and which will have to be constructed in such a way as to guarantee reliable use of the device, corresponding both to my intentions and to its potential. I'm going to have to learn how to use it. This can be done through a more or less institutionalized system of transmission – in a vocational school, with an elder, and so on. In an amateur setting, this is often done via the instruction manual.

The instructions for use, the manual or user's guide, are one of the essential manifestations of the technical nature of the device. By shifting my gaze from the object itself to its instructions for use, I recognize it as a technical object, requiring knowledge and safeguards.

This document is a complex discursive device. Its vocation is first and foremost technical, and on this point it is fundamentally normative: it is a matter of instituting the *right* gestures, those that will enable me to obtain the expected results from the appliance – that is, the results that the engineers have imagined to be those I expect from my new acquisition – and those that will best preserve the appliance's lifespan. Furthermore, in their very form, the instructions for use will regulate the level of technicity recommended in the relationship with the machine. We could put it this way: the machine will be perceived as complex if the instructions are long, and as simple if they are short. The length, precision, and complication of the instructions will be interpreted by me as indicators of the object's level of technicity, and I will adjust the level of attention I pay to it when using it accordingly. The manufacturers may manipulate this singular discursive form for effect, but they must remain attentive to the technical efficiency of the document. Handling procedures must be clearly detailed, so as to be exactly understood by the typical user envisaged by engineers, designers, and marketers. In this sense, the instructions don't just describe a series of possible and necessary gestures; beyond that, they intend to turn me into

the *good* user the designers had in mind when making the object. They shape me as they have shaped the object, making me part of the common space they have created, so that the way they have designed the machine, the uses they have foreseen for it, and the set of actions they have entrusted to me are all coherent.

It may be that, in the case of certain highly specialized devices, these discursive frameworks are not particularly ambiguous: there is only one thing you can do with the machine, and there are not an infinite number of ways to go about doing it. But the media devices we are concerned with here are different. Their expressiveness implies a multiplicity of possible uses, variations that are offered to me to enable me to adapt the instrument to singular contexts and projects. The media machine thus leaves me a specific place; it enters into dialogue with me on the basis of what Gilbert Simondon called, in the introduction to *On the Mode of Existence of Technical Objects*, its "margin of indeterminacy" (2017, 17). This margin is nodal for Simondon, and its definition comes at a crucial polemical moment for his work. Indeed, it is what opposes the false perfection of automatism: an automatic machine is defined by the fact that it has no margin of indeterminacy. It is here, however, that the term technicity is used for the first time in the book:

> The true progressive perfecting of machines, whereby we could say a machine's degree of technicity is raised, corresponds not to an increase of automatism, but on the contrary to the fact that the operation of a machine harbors a certain margin of indeterminacy. It is this margin that allows the machine to be sensitive to outside information. (Simondon 2017, 17)

This passage is essential. Starting from what he sees as a "hidden logical flaw" (Simondon 2017, 17), dominant in culture, which consists of associating technical sophistication with automation, Simondon comes to propose an entirely different conception of what technical value is, and hence of technics itself. In his view, automation is a technical impoverishment, because "[i]n order to make a machine automatic, one must sacrifice a number of possibilities of operation as well as numerous possible usages" (Simondon 2017, 17). Conversely, the rich technical object is the one that preserves the widest range of potential uses; what characterizes it is sensitivity, the possibility of participating productively in different environments and projects. This "margin of indeterminacy" thus characterizes the truly technical object, because its sophistication is not just a matter of an internal structure cut off from the outside world. In fact, the internal structure of the technical object must *not* be cut off from the outside world, and its technical value

lies in its ability to integrate local conditions and current issues into its operation. To conceive an automatic machine is to conceive an entirely hermetic system; that is the easy way out. More broadly, this principle refers back to Simondon's entire philosophy, in that for him there is never a closed, self-sufficient individual, defined once and for all within its boundaries. The individual is but a moment in a process of individuation that never ceases to re-accomplish itself; the edges of the individual – technical as well as biological or crystalline – are always porous, places of exchange and replay. Complete closure defines death. So, this privilege given to the "margin of indeterminacy," in defining what is truly technical about a machine, implies a conception of technics that always overflows, and involves the internal structure of the object – essential for Simondon – but also the environment and the user.

To Film Well …

The instructions for use are located exactly at the interface between the machine and the user. In a way, what it describes is exactly the technicity of the device. An automatic object hardly needs an instruction manual, or only an extremely limited one. But in the case of an object with a large "margin of indeterminacy," the manual may itself sacrifice possible uses and operating possibilities, because what it describes is not the machine's objective technicity, but rather its "projected technicity" – to extend Madeleine Akrich's notion of a "projected user" (Akrich 2010, 210). The "projected technicity" is the one which designers have imagined in relation to the users and usages they have in mind. Let us take an example. The H series of Bolex cameras was one of the Swiss firm Paillard's greatest industrial successes. Between 1935 and the 1970s, tens of thousands were produced at the company's factory in Sainte-Croix in the Canton of Vaud, and today they not only remain emblematic of the film era, but are also still widely used by amateur and experimental filmmakers, as well as by film-education institutions. In the 1950s, they were sold in a stamped leather pouch that housed the machine and its accessories (hand crank, pistol grip for hand-held shots, empty take-up reels), as well as various documents: certificates of authenticity and warranty for the camera and its lenses, and a handy 22-page booklet (16.5 x 11.5 cm) with an illustration of the camera on the front cover, the Paillard logo, and the title *Pour bien filmer …* (Paillard n.d.).

When the brochure was opened, another title appeared: "Instructions pour l'emploi des caméras Paillard modèle H." The cover page unfolded to

Fig. 5.1: Paillard instruction booklet, *Pour bien filmer* …: front foldout.

reveal a more detailed illustration of the camera, as well as a diagram of the viewfinder and another showing the two film formats that could be used, depending on the model, namely 16mm film and double 8mm film (Fig. 5.1).[1] The H8 cameras used the latter format: the negative is 16mm wide, but only exposed on half its width. At the end of the reel, it can be turned over to record the other side – like a vinyl record, as it were, or, rather, like an audio cassette. During development in the laboratory, the reel is split in two, to obtain an 8mm-wide positive, and the length doubled by splicing the two rolls together. Since the negative is the same size as the 16mm, the H8 is no smaller than the H16, no less heavy and cumbersome – and no less expensive. What the small size of the 8mm image loses in detail, it gains in shooting time and development costs: a 30-meter reel of 16mm provides a shooting time of around 2'40" at 24 fps (3'40" at 18 fps), while a double 8mm reel of the same length shoots almost 5'30" continuously at 24 fps, that is, 11 minutes when both sides are added together. Going down to 18 images per second, which is perfectly acceptable if you are not shooting a sound film,

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1   In the 1930s, Paillard also produced H9s, adapted to the 9.5mm format sold by Pathé beginning in 1922. This format was a great success in Europe, but not on the American continent. Paillard lost interest relatively quickly; H9s are rare.
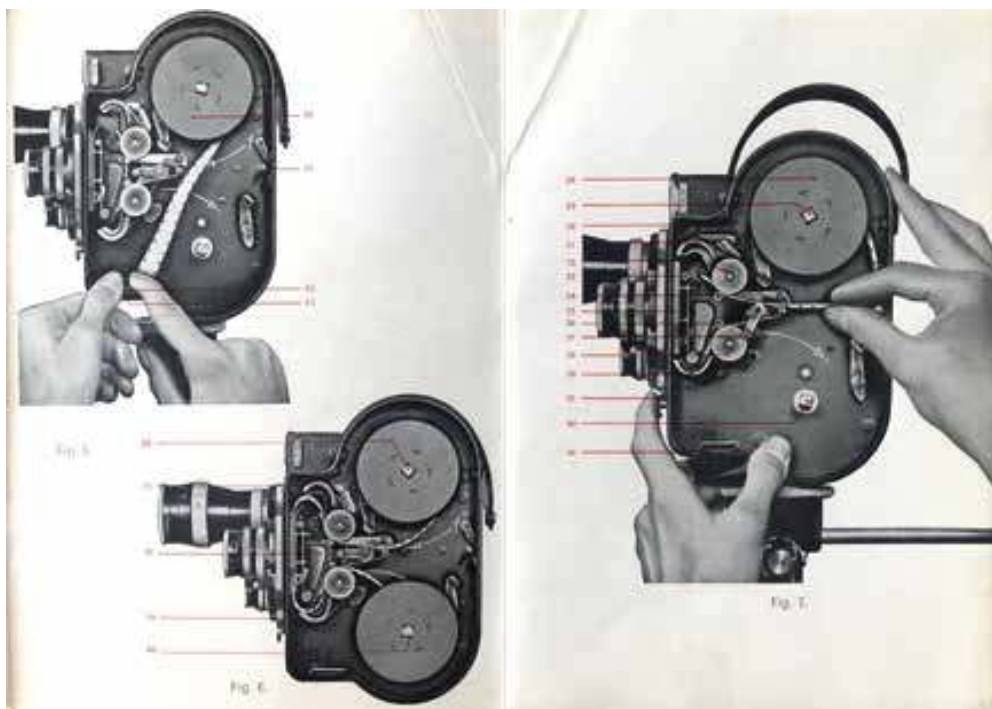
Fig. 5.2: Paillard instruction booklet, *Pour bien filmer …*: back foldout.

you can do almost 15 minutes of uninterrupted shooting with 30 meters of double 8 format film.

The back cover of the booklet also folded out, with three large diagrams illustrating one of the most delicate operations that the lucky owner of the Swiss camera would have to perform, namely loading the film into the machine (Fig. 5.2). All these drawings and photographs are annotated with a series of numbered red lines, which are referred to throughout the booklet (on page 3, for example, we read: "Make sure that flaps 34 and 36 are closed against sprocket wheels 32 and 38, and that flap holder 33 is closed against corridor 35"). The fold-out cover made it possible to keep the diagrams visible while reading the directives.

Under the heading "Instructions," the first page presents a list of six sections: I) Loading the camera; II) Transporting the film, and unloading the camera; III) Lenses; IV) How to shoot, General rules; V) How to shoot, Various possibilities; VI) Maintenance. Each of these sections is divided into brief, boldly titled paragraphs, each of which presents either a specific operation ("Registration for changing partially exposed film"; "Shooting frame by frame: 'photo'"; "Correcting parallax"), or a prohibition ("Never turn the winding crank while the motor is disengaged"). As can be seen from these few examples, many of the instructions belong to what could be called a strictly technical domain. The Bolex H is clearly a complex machine: on

the right-hand side, there are two dials, one with two lines, a three-position knob, a thumbwheel, two levers, and two cranks, one of which is removable, plus the main knob under the lens turret – each of which has two adjustment rings (diaphragm and focusing distance). The removable clear viewfinder features a thumbwheel, slider, and two small levers, and can be set to two different positions on the camera body. Finally, the opening on the left-hand side reveals the rollers, levers, and film unwinding chute. In all, the diagrams in the fold-out part of the booklet bear 43 references to devices with which the user was likely to interact. Some of these devices *must* be in a specific position, depending on the phase of operation – otherwise there would be a malfunction. Others, on the contrary, *can* adopt several configurations, which will affect the final result as variations without a priori constituting a malfunction. These options embody one of the forms of the Bolex's "margin of indeterminacy": the mechanism can run at several frame rates, but also frame by frame; it can also rewind the film to, if desired, the exact frame, thanks to the various meters visible on the side.

On the one hand, therefore, the instructions must ensure that the user is able to perform all the actions *required* to operate the machine – knowing which devices *need* to be in which position at which time. But the instructions must also explain how the other devices *can* be used to create a multiplicity of individual, personalized configurations. The first level of "strictly technical" operations involves, a priori, no stylistic or individualized stakes: a camera is simply well loaded (the film runs smoothly) or poorly loaded (the film breaks, is scratched, jams, etc.); no variant seems to offer a way out of this binary, hierarchical dichotomy. The second level, on the other hand, immediately engages questions of a different order: it's not just a question of knowing how to do the operation properly, but of knowing how best to adjust the operation to suit the project and conditions.

Of course, while these two levels remain distinct for the user, they are not as hermetically sealed as I have just described. First, even the most "strictly technical" operations can occasionally be unlocked by aesthetic research, which we would probably call "experimental," precisely because it brings into play parts of the process that are *black-boxed* in the "normal" use of media production machinery. Second, it may not be obvious whether a given operation *must* be carried out in the only right way, or whether it tolerates productive stylistic variations.

The notion of the "black box," proposed by Michel Callon and Bruno Latour in some of the most important texts in actor-network theory, aptly describes this progressive delimitation and naturalization of a "normality" based on a silent norm, whose strength lies in its tacit character. For Callon and Latour's

black boxes are something other than material boxes, something other than objects; the "black box" is not a notion of technology, but of sociology. It is about understanding how, in a given society, micro-actors – you or me, for example – fragile entities with little weight, at the mercy of disasters or the whims of the powerful, can gradually become macro-actors, forging alliances and support to gain in resistance, power, stability, and longevity. The secret of this growth lies in black boxes:

> A player grows in proportion to the number of relationships he can put, as we say, in black boxes. A black box contains that which we no longer need to return to; that whose content has become indifferent. The more elements you put in black boxes – reasoning, habits, forces, objects – the larger the constructions you can build. (Callon and Latour 2006, 19; my translation)

The materials the authors are talking about here are not only physical: they are "habits, words, wood, steel, laws, institutions, difficulties, feelings […]" (Callon and Latour 2006, 19). What is in the black boxes is exactly what is taken for granted, completely naturalized, and no longer up for discussion. Black boxes are therefore not, or not only, closed and opaque technical objects; in the context of the sociology of science, the notion presents itself rather as an extension of the concept of *paradigm* as elaborated by Thomas Kuhn. For Kuhn, scientific revolution is the discovery of a crack in the black box of the paradigm.

The instructions for use therefore have the task of clarifying the distinction between the two levels of what we *owe* to the machine and what we *can ask* of it, but in doing so, they take a stand on certain ambiguous cases. The first three chapters of the "Instructions" for the Bolex H16 are, a priori, strictly technical: you need to know how to load and unload the camera, arrange the lenses correctly, wind the spring with the crank, trigger the motor and take the shots. Chapters IV and V, both entitled "How to Film" and subtitled "General Rules" and "Various Possibilities," respectively, are on a slightly different level. The division into two sections seems to follow the distinction of levels I have proposed: first, the "rules" that *must be* followed, then the "possibilities" that *can be* explored. The first section covers the fundamentals of focusing, exposure, and framing – for example, parallax correction of the viewfinder if the camera is not a reflex model, introduced by Paillard in 1956. In the second, the presentation of options is more cursory: it briefly explains how to shoot titles, fade in and out, use special filters, or what precautions to take when shooting in color or indoors.

Yet this separation proves problematic. The "rules" in Chapter IV are not restricted to "strictly technical" criteria. For example, after indicating how to adjust the diaphragm and before reminding us that the camera spring must be wound up after each scene, the pamphlet provides a paragraph entitled "Panorama." It states: "Pan very slowly. Let the subject move in the lens field, preferably without following it, otherwise very slowly" (Paillard n.d., 17; my translation). This is a rule, and the use of the imperative in its formulation does not suggest that a choice would be possible; yet it is clear that this recommendation does not concern the preservation of the camera, does not refer to any possibility of breakdown, and is guided only by a concern for the "quality" of the result, the criteria of which are ultimately debatable. The immediately preceding paragraph, entitled "Fixity," is even more rigorous:

> Keep the camera *very steady*. Use a stand or fixed support whenever possible. A tripod is essential for all lenses with a focal length exceeding 50mm. The base *4* of the H camera is fitted with a universal screw thread (congress). For use with the Kodak screw thread, an intermediate ring can be supplied. (Paillard n.d., 17; my translation)

This passage is an exemplary blend of mechanical considerations – congress screws and Kodak adapters – and the assertion of the "necessity" of a tripod for long-focus shooting, as if the latter were subject to the same set of "rules." In the former case, the integrity of the machine is at stake – an attempt to fix the camera with unsuitable screw threads can damage the base, the camera can fall, and so on – but this is certainly not the case with a telephoto shot taken with a handheld camera. The films of Jonas Mekas, who shot all his film work with a Bolex H16, or Stan Brakhage and so many others demonstrate that these rules imposing fixity, or slow camera movements, can be completely ignored, and have no legitimacy other than that which we are willing to grant them.

I do not mean that these "rules" have no place in an instruction manual such as this one. It would be absurd to imagine completely separating the needs of the machine from the needs of the user, and equally absurd to imagine that the user's needs could not be framed by cultural expectations. Technical mastery of a camera means not only the ability not to fog the film, but also the ability to film, and even to *film well*. Similarly, mastery of a guitar refers not just to knowing how to fit its strings, or even how to make sounds from them, but to the ability to produce something with the instrument that feels like music.

To go from noise to music fundamentally refers to a cultural framework, partially implicit although formalizable, whose problematic nature is well known – several of the most experimental fringes of contemporary music, from *noise* or *free jazz* to the work of John Cage, have struggled to interrogate its edges and presuppositions. But for the guitar instrument, this also has technical implications: for example, it may seem *necessary* to the amateur musician to tune the instrument. But tuning a guitar is not a technical imperative intrinsic to the instrument, or a radical requirement for its preservation; it is rather the integration of the cultural conditions of its environment into the very structure of the guitar machine. However, while it is of course possible to play an out-of-tune guitar, it is also clear that the neck is designed by the makers to support a certain tension of the strings, corresponding to a tuning. Playing with strings with a tension far removed from the supposed standards could actually damage the instrument. So, a guitar instruction manual could not separate "strictly technical" instructions from the cultural expectations attached to the use of a musical instrument. But these expectations are already partially inscribed technically in the structure of the instrument. They may be more or less deeply embedded: while it is possible to tune a guitar or a violin according to harmonic models far removed from Western canons, this is more difficult for a piano – an instrument for which the division of labor is stricter between instrumentalist and tuner – and practically impossible for a saxophone.

By giving his booklet a double title – "Instructions for Employment ..." and "Pour bien filmer ..." (to film well) – Paillard recognized that the instructions for using a camera could not be confined to strictly technical explanations, and had to include considerations of use that went beyond mechanical precautions to reach a stylistic dimension that was in fact inseparable from the camera.

Stylistics, Feminism, and Technicity

This stylistic element is a technical one; it is an integral part of the camera's technicity. The problem with the instruction manual in this respect is that it transposes to this aesthetic level the normativity that, on the "strictly technical" level, was justified for the preservation of the machine, or the device in the broader sense (including lenses and film in particular). The camera magazine *has to be* hermetically sealed, the perforations *have to be* engaged in the lugs of the rollers, the tripod's thread *has to be* adapted

to that of the base. But the "have to" of *you have to pan very slowly* does not have the same degree, or the same kind, of normativity. For sure, these imperative formulations don't come out of the blue: they appear in response to feedback and observations of frustrations, of gestures frequently spotted and perceived by users as errors. The aim of the instruction manual is to enable the apprentice filmmaker to get rid of these "technical" errors more quickly, so as to approach the dominant standards, which are in fact – in *general* – those of mainstream cinema. The very fact of including such considerations in the instructions for use helps to black-box these "normal" practices, preventing us from imagining that we could do things differently; and, under the pretext of erasing errors, the wily discursive device that is the instructions for use participates in a profound formal standardization.

Nevertheless, it is important to remain sensitive to what this inclusion in the instructions for use of *you have to pan very slowly* reveals. Achieving a "beautiful" camera movement is a matter of acquired expertise, of know-how and even virtuosity – just as the art of filming with a handheld camera is an art, especially with a long focal length. Anyone who has tried their hand at it will appreciate its difficulties and delicacies.

In BEYOND THE BOLEX (2017-2018),[2] director Alyssa Bolsey features an interview with filmmaker Barbara Hammer. In it, Hammer recounts how she taught filmmaking to women using the H16, explaining that it was particularly well-suited to them: because they have wide hips, their center of gravity is lower than that of men, enabling them to find a comfortable balance when making movements with their natural strength. As she speaks, she demonstrates: pistol grip in her right hand, legs bent and straight back slightly inclined, her left hand lightly guides the machine, engaged in the top handle or simply resting against the back of the maga-zine (Fig. 5.3).

She takes several steps and, with her eyes riveted on the camera, makes it follow great loops, toward the ground and the sky, then all around her, finally letting go of the handle and holding it only by the strap, making it skirt the ground gently. Woman and machine thus dance together, a ballet made possible by the specific balancing effects of the female body and the camera body, and by the spatial distribution of weights and shapes. This choreography is also made possible by another nodal technical element in this configuration: Hammer points out that there is no need to keep

2   Produced by Dschoint Ventschr/Sea Owl Productions/Akka Films, 2017 (52-min. version) and 2018 (91-min. version).

Fig. 5.3: Barbara Hammer in Beyond the Bolex (Alyssa Bolsey, 2017).

her eye in the viewfinder, since she uses a short focal length lens (10mm), which embraces a large part of the space and has a depth of field that ensures that practically everything is in focus. This choice detaches the two bodies, giving them distance that radically alters the set-up, with the arm becoming their only junction, an arm free of its articulations – wrist, elbow, shoulder. Hammer no longer films with her eyes; she films with her stomach (Fig. 5.4).

What Hammer is teaching here, and what she demonstrates in Bolsey's film, is a technique. It involves the main ergonomic features of the Bolex H16 machine: weight, balance, location, and shape of the handle and strap, lenses, and so on. It also involves the operator's whole body, from the joints and muscles of the arms to the hips and legs. Finally, it mobilizes a singular conception of cinema as a whole, in which the feeling of movement as such takes precedence over the precision of framing, to the point where the eye is completely freed from the viewfinder. In this way, the modes of interaction between camera and body completely elude all the presuppositions of "normal" Bolex use. This practice contravenes the imperatives set out in the instructions for use, as it goes beyond the framework imagined at the time of conception. Still, it does not move out of the Bolex's specific sphere of technicity; on the contrary, it enhances certain usually overlooked

Fig. 5.4: Barbara Hammer, Dyketactics, 1974. Screen capture from video file.

aspects of the machine itself, in its interaction with the operator and the environment.

This clear departure from traditional criteria for "good filming" engages a critique of their implicitly masculine dimension, as well as that of the film forms that proceed from them. Hammer's approach to the female body and its relationship with the technicity of the camera is the starting point for the development of a technique that is transmissible, controllable, and complex. The way she masters the gestures and movements of her body with the movements of the machine displays a genuine, obvious virtuosity, echoing certain well-known images of Jonas Mekas repeating an ample movement at arm's length with his Bolex in Central Park, the eye detached from the eyecup there too. But Hammer makes its feminist and critical content explicit. She reverses the original gendered orientation of the H16 – a camera considered better suited to a male user, the devices assigned to female audiences being dominated by a logic of extreme lightness and simplicity of use – to reveal a deeper femininity, which involves a refusal of the primacy of the gaze and a revaluation of the body. This technique is masterful in its precision and coherence. It opposes the standardization of operating instructions to exploit the

objective technicity of the machine in a completely different direction (Powers 2022).[3]

Interpreting Objects

The instruction manual is therefore the place where technicity is expressed, but also the place where an attempt is made to control this objective technicity, to keep the object within the framework of use imagined by the designers. Yet this control, this discipline imposed on users, can only be relative. The object's technicity is always in excess; the object always makes unforeseen uses possible, by integrating itself into different projects and contexts, and different cultural, historical, and geographical environments. This essential aspect of technical objects has been formulated in several ways, depending on the theoretical perspective.

Sociologists involved in the "SCOT" (Social Construction of Technology) approach named it the "interpretative flexibility" of technical objects. That notion is crucial in their model for understanding the innovation process: an object can never be univocally interpreted by all the social groups involved in its design and use; it is always susceptible to several interpretations. In this way, a multidirectional model of technical evolution is developed, in which versions and variations of an object are identified, and an attempt is made to understand the laws of "selection" by which certain varieties survive while others die out (Bijker, Hughes, and Pinch 2012, 20-22).[4] This concept is clearly developed within the framework of a sociology of innovation, applied to the moment of emergence of a new artifact (the bicycle, the light bulb), in order to understand how the object's form and place in the host society are progressively fixed – in this sense, my application to the Bolex case is a little off the mark.

Other approaches have sought to address this issue outside the strict framework of innovation. Drawing on the phenomenological tradition, Don

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3   At the Society for Cinema and Media Studies 2022 conference, John Powers presented a paper on "Kinesthetic Camera Movements in Experimental Cinema," based on a number of uses of the Bolex, for instance, by Maya Deren (A STUDY IN CHOREOGRAPHY FOR THE CAMERA, 1945). In particular, he recalled that filmmaker Robert Fulton had developed camera movement techniques based on the rejection of nervous and muscular tension, preferring forms of mutual body-machine accompaniment derived from tai chi chuan. These techniques can be seen, for example, in RUNNING SHADOW (1971). Fulton explained them on Robert Gardner's SCREENING ROOM television program, which he shared with Rudolf Arnheim in 1973 (Powers 2022).

4   The term "interpretative flexibility" comes from the "Empirical Programme of Relativism" as it developed in the sociology of science (Bijker, Hughes, and Pinch 2012, 20).

Ihde has proposed the term "multistability" for the ability of technical objects to integrate into a given cultural fabric to the point of appearing profoundly transformed: "the 'same' technology in another cultural context becomes quite a 'different' technology" (1990, 144). The term "multistability" comes from the phenomenology of perception: Ihde understands the different ways in which the same technical object is apprehended in distinct contexts by drawing a parallel with the way in which the subject, faced with an ambiguous form, immediately opts for one of the possible interpretative solutions, to the exclusion of all others. Thus, for two different subjects, the same ambivalent drawing will represent a different object, to the extent that it will be difficult for each to understand what the other sees. Within the framework of the "cultural hermeneutics" of technics that Ihde develops here, the aim is to show that these variations in apprehension involve both a sensory dimension (micro-perceptual) and the *situation* within a culture (macro-perceptual level). In this way, Barbara Hammer's Bolex becomes *a camera other than* the Bolex of the instruction manual, because its reception is *situated* by the double context of experimental cinema and feminist thought.[5]

This post-phenomenological "cultural hermeneutics" enables us to understand the scale of the transformations implied by the *displacement* of technics; it also has the advantage of underlining the extent to which the apprehension of a technical object is always immediately collective. Technics are *embedded*, says Ihde: integrated into a specific environment that shapes, deforms, and reshapes them; appropriated and reappropriated; localized and creolized in every possible way. A device has a meaning, a function in one place, it has others elsewhere, and still elsewhere it is incomprehensible. Each time, something else is required of the object, different results are expected, different properties are needed, specific arrangements are made. The same technical object is different.

Thus, writes Peter-Paul Verbeek, "the behavior of technical objects is never completely predictable": "Technologies inevitably enter into unforeseeable relations with human beings in which they can develop unexpected morally relevant impacts" (2011, 51).[6] One of Simondon's statements could

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5   On this question of *situation* in relation to a feminist epistemology, see Haraway 1988.

6   Verbeek speaks here of "moral" effects; his main example is the obstetric ultrasound, which has revolutionized the way women and men experience pregnancy, posing new problems – in connection with the perception of disability, for example, and the evolution of legislation and culture – and constituting one of the frameworks for their resolution. It is also worth noting that in this chapter, in coherence with Simondon's conceptual framework, I use "technical objects" to refer to what most English-speaking scholars describe as "technologies."

be read as somewhat similar: "the technical object is never completely known" (2017, 35). It can always do something other than what was intended, enter into confusing individual or collective configurations, be used for strange purposes. Its technicity is a potential, always greater than the sum total of its historically determined concrete uses. Usage is always already conditioned by local historical and cultural conditions, but it can always be something else. It is also this real otherness of the technical object that makes possible the relationship of friendship between humans and things envisaged by Simondon, engaging in an exchange where, even if the human has conceived the object, the latter immediately becomes a partner, endowed with a form of equality, with an irreducible individuality of its own. Technicity thus becomes the common space of exchange between human and non-human, and it is crucial that this notion is understood as relational, and as being *symmetrical*: Simondon's technicity defines both the elaborate mechanical structure of the Bolex and Barbara Hammer's virtuoso gestures. The machine's "margin of indeterminacy," by enabling its sensitivity to information from the external environment, is the condition of possibility for this exchange.

On the one hand, then, the user manual is intended to provide me with the vocabulary that will enable me to enter the machine's sphere of technicity: thanks to it, I'll be able to manipulate the object without colliding with it, I'll be able to interpret it, hear the relevant noises, discover problems or malfunctions, produce images and build film projects. At the same time, however, the instruction manual presents me with a certain *state* of the machine, a version that attempts to inscribe in the depths of my imagination the "right" conception of the object, the one that corresponds to the design intentions. The instructions for use attempt to resolve the object's multistability, its propensity to generate possibilities, by transforming it into a strict hierarchy of what is right and what is wrong. For the user's manual, a blurred shot is a failure, as is a too-rapid pan, an overexposed image, or a shaky frame. In his masterpiece NOTES ON THE CIRCUS (1966), Jonas Mekas showed how these "mistakes" constitute rich and profound aesthetic material (Figs. 5.5-5.10). They may be mistakes, yet Mekas makes exemplary use of the specific technical possibilities of his Bolex H16: sophisticated overprints made possible by the combination of film winding in the camera, frame counter timing and clean start without frame loss; multi-frame and frame-by-frame shooting; and so on. Mekas's technique is also virtuoso, like Hammer's, although it's quite different; it's at the heart of Bolex technology, but it's also completely outside what Paillard considers to be the art of *good filming* ...
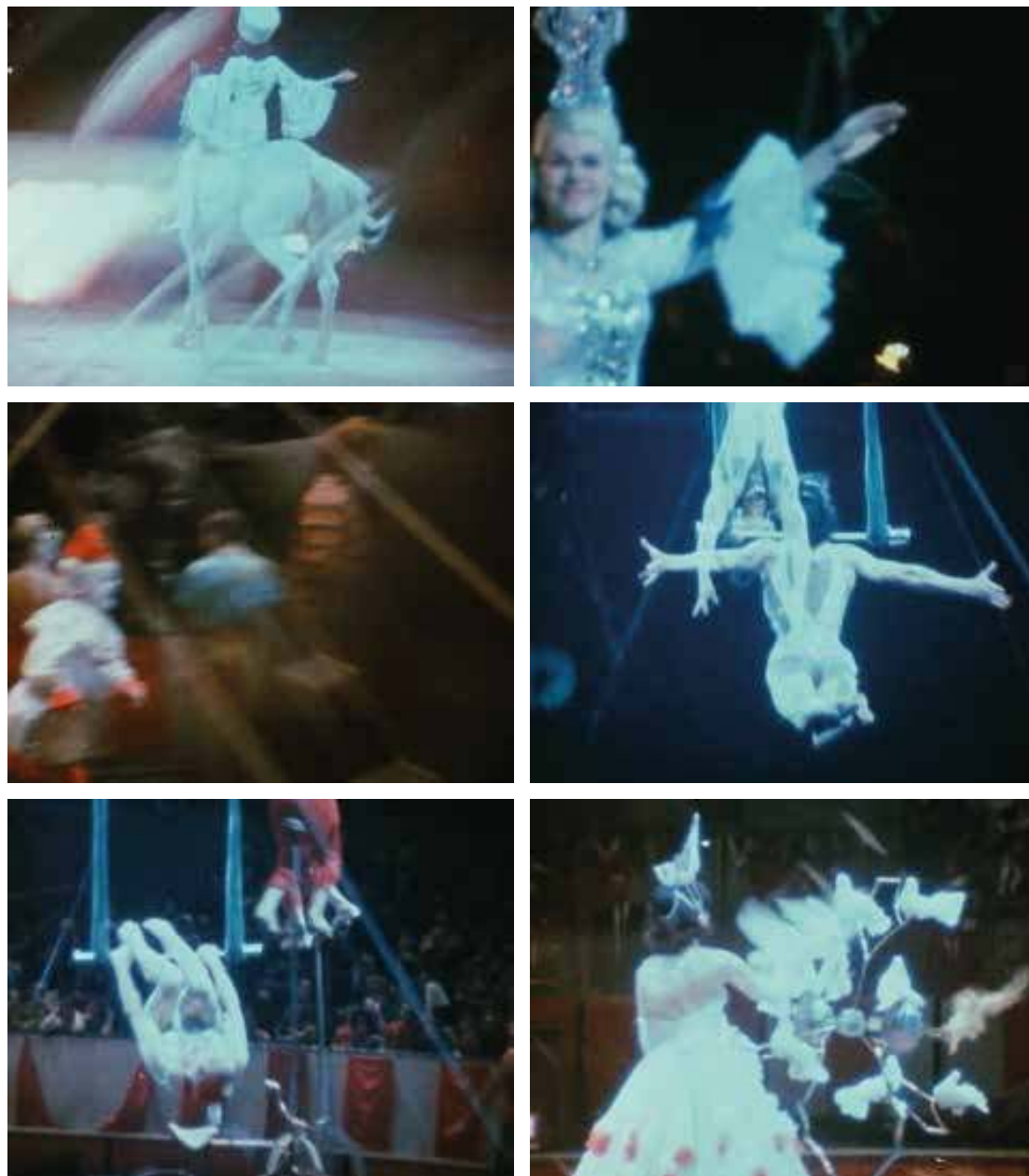
Figs. 5.5-5.10: Jonas Mekas, Notes on the Circus , 1966. Screen captures from video file.

Taking Care

The instruction manual is therefore a gateway to the technical side of the machine. There are others: you can learn how to use it by following the teachings of Barbara Hammer, for example, or nowadays by watching a tutorial on YouTube, or by asking other users in clubs or on forums. These distinct inputs create different machines each time; they integrate the camera into singular, heterogeneous concrete and imaginary configurations.

Each of these modes of learning constitutes a discursive dispositif arranged with the machinic dispositif; each of them models the user, transforms their gestures, exploits their strengths and points of equilibrium, nourishes and produces a certain conception of cinema, technics, even politics and the environment. It is a conception that is always *embedded*, deeply part of a local aesthetic and technical culture.

However different they may be, these entries into technicity nevertheless have some unavoidable points in common, corresponding to the "strictly technical" instructions essential to the machine's basic operation and preservation. At this level, the object imposes its own requirements, just as the user's body will impose its own on others. From this point of view, it's worth pointing out another aspect of the instruction manual that I've only hinted at: the last chapter of *Pour bien filmer ...* is entitled "Maintenance." This is an important aspect of the relationship between human and machine: I have to know not only how to *use it*, but also how to *look after it*.

Attention to servicing, maintenance, and repair is at the heart of the technical relationship. It requires prolonged, in-depth technical expertise, extending to the point of care. It implies going beyond the relationship of instrumentalization, to apprehend the object's own needs. It implies a respect for the technical quality of the manufactured object: I have to observe the state of the materials, listen to the noise of the engine, inspect the general level of cleanliness. This attention, which comes into play *after* use but may already be in play during operation, puts me in the position of having to decipher the signs by which the technical object tells me what to do. If I observe carefully, I can even learn from it whether my gestures suit it, if they don't damage it: maintenance engenders a dimension of reflexivity in the relationship with the object. A good worker takes care of their tools.

Servicing and maintenance also mark an important moment, in that they materialize the fact that I am not the only one in charge of the object's technicity. The technical relationship is not just between the operator and the machine; it involves other people and other objects. In *Pour bien filmer ...*, the chapter "Maintenance" gives basic advice on preserving the Bolex: keep the camera away from dust and moisture; use very fine tissue paper or a soft, dry cloth for the lenses; and wrap cloth around the tip of a pencil to clean the print window, which must be kept free of deposits. Then there's the question of lubrication, and here the manual hints at some objections: the Bolex H camera "is like a quality watch: it only needs to be greased very infrequently" (Paillard n.d., 21; my translation) – a phrase that refers to the Swiss context in which Paillard operates, the mechanical excellence of the H16 being confirmed by the reputation of the local precision-watchmaking industry.

And finally, when the need for intervention arises, "it is recommended to entrust this lubrication to the camera supplier, preferably" (Paillard n.d., 21; my translation). If you insist, the instructions briefly describe how to do it yourself, but it is a matter of operating "very carefully."

This is where the principle of a division of labor, responsibilities, and skills comes into play. The machine needs the operator's concern, but some tasks require a somewhat different kind of expertise, as well as specialized equipment – perfectly adapted lubricating oils, spare parts, precise tools for dismantling, etc. In practice, prolonged use of the machine can only be imagined if what Simondon calls a "technical network" exists around it: accessible spare parts, an infrastructure for transport and sales or exchange, and technicians with repair skills. For a film camera, you also need to maintain a network for manufacturing and processing the "consumable": the film. The technicity of the machine is a networked, deployed technicity, involving a large number of humans and non-humans.

So, there is a clear division, established in the instructions, between what I am responsible for and what has to be done by a specialist. The prescriptive nature of the operating instructions is then reinforced by another discursive dispositif: the legal system of warranty. If a problem arises during the warranty period, it can only be taken care of if I have carried out the maintenance operations specified in the manual, and if I have not ventured into areas of the machine that I should not have touched. There is obligation and prohibition. Before a coda on the location of the serial number, the very last paragraph of the booklet *Pour bien filmer …* explicitly states: "Never attempt to disassemble the H camera mechanism. Failure to comply with this rule will result in the loss of any right to any guarantee of proper operation of the device" (Paillard n.d., 21; my translation). Here again, the instruction manual organizes a tension: on the one hand, it constructs the space of technicity that I will be able to share with the machine; on the other, it reserves voids in this space, places of technicity that are rendered inaccessible to me. This establishes the principle of a limit to the users' competence: they are not supposed to know how to do it, shouldn't be supposed to know how to do it, should be prevented from doing it.

Where should this boundary be placed? This is a political decision, based as it is on an idea of the user, linked to the general level of technical education supposed to circulate in society, as well as to the way manufacturers – Paillard – model the buyer of their machine. These two imaginaries are not at the same level, but they are not independent of each other. Present right from the start of the design process, they have already structured, more or

less explicitly, the very shape of the technical object, constituting a set of expectations, presuppositions, possibilities, or exclusions.

The space of technicity shared by machine and user is thus both opened up by the instruction manual, but also configured by it, and restricted. If there is a political dimension inscribed in technical objects according to Simondon, it lies in the opening of that space of technicity, in the opening of machines, and in the reconsideration of technical skills as authentic knowledge.

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6. Knowing, Studying, Writing: A Conversation on History, Practice, and Other Doings with Technics

Ranjodh Singh Dhaliwal and Bernhard Siegert

Abstract
This conversation sets out to critically delineate the distinctions and overlaps between technology, technique, technē, and tools. In a free-flowing dialogue, Ranjodh Singh Dhaliwal and Bernhard Siegert attempt to situate the concept of technology within its various historical and geographical locations. Discussing the utility and validity of rhetorical techniques used by popular and academic histories of technology, they debate the benefits and limits of applying modern technological terms to historical practices. Moreover, Dhaliwal and Siegert ponder the relationship between mediation and techniques; reflect on how practices are instituted; and note some origins, evolutions, and divergences pertaining to media studies as a transatlantic discipline.

Keywords: cultural techniques, Friedrich Kittler, German media theory, media technologies, institutional infrastructures, methodologies

Bernhard Siegert has been the Gerd Bucerius professor of History and Theory of Cultural Techniques at the Media Faculty at the Bauhaus University, Weimar, since 2001. He studied German, philosophy, general and comparative linguistics, Jewish studies, and history in earlier parts of his career, and worked with Friedrich Kittler during the resurgence of media theory within the German academy. Siegert has since held research and teaching positions at several institutions around the world. From 2008 to 2020, he was a director of the International Center for Cultural Technology Research and Media Philosophy (IKKM), which he founded together with Lorenz Engell. Since

April 2021, he has been leading the project "THE NEW REAL: Past, Present and Future of Computation and the Ecologization of Cultural Techniques," which is funded by a research grant from the NOMIS Foundation.

Equally conversant in early modern maritime protocols and technicalities of digital signal processing, Siegert has published work including the influential *Relays: Literature as an Epoch of the Postal System* (1999) and the methodological tour de force *Cultural Techniques: Grids, Filters, Doors, and Other Articulations of the Real* (2015), which articulated his own theory of cultural techniques (*Kulturtechniken*) – a group of operations that, for Siegert, "precede the distinction of nature and culture" and "[operationalize] distinctions in the real" (Siegert 2015, 13, Siegert 1999). One of the leading lights of so-called (in the Anglophone scholarship) "German media theory," Siegert often brings situated studies of cultural practices across the centuries into conversation with contemporary philosophical issues around mediation and computation.

Here, he converses with Ranjodh Singh Dhaliwal, who is the Ruth and Paul Idzik collegiate chair in Digital Scholarship and assistant professor of English and Film, Television, and Theatre at the University of Notre Dame, Indiana. Dhaliwal's work – situated between media theory, literary studies, and science and technology studies – deals with, among other topics, the techniques of rendering politics techno-logical. His award-winning works on the history and theory of addressability (2022b) and the posthuman subjectivities undergirding computational labor (2022a) ask how we may delineate an ontology of computation beyond digitality. This conversation took place on June 21, 2023 in the office of Bernhard Siegert (located temporarily within an ex-Coca-Cola factory) at Bauhaus University, Weimar, where Dhaliwal was visiting as a NOMIS research fellow. It has been edited and trimmed for clarity.

Tools and Technology

Ranjodh Singh Dhaliwal (RSD): Bernhard, I've been meaning to have this conversation with you because so much of what I now know about technology, I've known through your work. The way I thought about technologies as just objects was opened into the questions of techniques and practices through encountering the whole field of cultural techniques, and for that I am grateful. One of my goals for today is to see if we can delineate and differentiate between terms and ideas often taken for granted. Given that I have a peculiar case of a science brain – I like thinking programmatically

and having clear definitional starting points – why don't we begin by putting some terms on the table? Let's start with some of the central terms of this volume: technology, technique, and technē.

Bernhard Siegert (BS): Okay. So yes, we are talking about technology, technique, and technē, but not only with the intention of coming up with a nice conceptual distinction between the three, but more thinking about what happens between these terms; what happened between these terms in the past, and now in the ongoing discussion, especially when it comes to what we still call media. We can think about the implications of studying these three terms.

RSD: It might be useful to start by picking a term and following it or trying to exemplify it. And then I'm sure complications and other things will emerge. The reason that I'm doing this is not because I harbor some kind of fantasy of distinction-making between the terms, but primarily because I suspect there will be some utility to certain collapses and certain boundary mergers between them. I agree that it's actually those collapses that are probably going to be more useful. So, if you don't mind, I think we can start with the terms themselves, one by one. To start, Bernhard, what is technology?

BS: I am tempted to start with a very common, intuitive, naive answer. Technology is represented by visible and invisible machinery that we have in our environment, or which is our environment. That's a starting point.

If we start thinking about a thing, we usually try to clear our minds by forming distinctions. I think the first helpful distinction is the distinction between tools and technology.

Are tools technology? No, tools are not technology. Why are they not technology? Because technology always implies an infrastructure, an institutional and logistical infrastructure. So, technology is not the screwdriver or the hammer that I can fabricate by myself in my workshop. That's not technology. Tom Hughes (1993) described technology with respect to, for instance, electricity and urban settings. Or you have technologies connected with research, with development, with logistics. You have to connect the people to technology and through technology people are connected to a history of technological research and all the things that go with it.

There are path dependencies, for instance; they are documented or made effective by patterns. At a very small scale, what I mean by a history of technology connects all these regulations, standards, norms, and so on. For the human or non-human being that becomes involved in technology,

it becomes noticeable that there are certain constraints that technological systems impose on the way you can deal with it, how you can live with it, how you can live *in* it.

But then we could also ask, isn't this the same with the tool? Of course. Tools also consist of constraints. But these constraints are much more traditional – at least that's how I think at this moment – in the sense of a classical subject-object relationship or a cause-effect causality. You use the tool in order to achieve something, a purpose, an end, and the tool is either appropriate or not. So, there are constraints, but these constraints at least seem to me more or less easily encapsulated within these models of cause and rationality, which is different from the constraints that technology imposes on us.

RSD: So, if you think technologically, you would say that it's not the case that you have the human subject trying to use something for a certain effect, but instead it becomes more complicated because the something – instead of the tool, technology – is already far more complex, and as a result, puts pressure on the position and the causal linkages between the subject and the world. Is that fair?

BS: That is going exactly in the direction of my thinking. And now here comes the first radicalization in a perhaps Kittlerian sense. What I have tried to prevent for many years is a way of thinking that takes an individual – or if you want to call it a subject – as a starting point for thinking about technology, which is then defined by the imaginations and projections of an individual human being. What we have been trying to do is to reverse this. In that branch of media theory that moves my thinking, we try to define the human being (or the individual/subject) in terms of the available technologies.

RSD: Great, I get that inverted relationship! Two of the people that I reach out to when I think about the word technology are the American historians Leo Marx and Eric Schatzberg (Marx 2010; Schatzberg 2018; Dhaliwal 2023b; see also Turquety 2014; Chateau 2014). I will note just two things from that tradition.

1. Technology, for them, emerges in the nineteenth century, and then gets popularized as a term in the early twentieth century. And it's essentially replacing a bunch of different concepts (including machinery) under one umbrella term that is technology. Marx has a fantastic bit where he hints at how perhaps the most technically correct use of the term technology is in the title of Massachusetts Institute of Technology (MIT), because in that case

it really is about studying the technē. Essentially, he shows that there was a semantic void and then technology appears as a term that fits into what people have been unsuccessfully trying to articulate for some time. This, as you pointed out, includes institutions, frameworks, financial institutions.

BS: Yes, the systematic aspect. Technologies are systems.

RSD: Precisely, these are systems of people, material things, and they show up as political systems, economic systems, pedagogical systems, etc. All these systems then get subsumed into the world of "technology."

2. The other thing pointed out, and this sometimes gets lost in the reception, is how the institutional framework of a corporate firm as it emerged in America was a unique location for the uptake of the word technology that then traveled elsewhere.

BS: That's true. It is also a point that Thorstein Veblen (1899) made.

RSD: Now, here is my question. If the term technology has its origins in nineteenth-century discourse, do you think there is something coterminous happening here? Because you introduced the distinction between tools and technologies also as a distinction between having institutional frameworks or not. And the way you described it, through electricity and so on, suggests that at some point in history, wherever you locate it, there was a switch, a switch that was also a subjective switch. Do you think that the switch between tool and technology happened alongside the conceptual switch or was there a lag between the practical switch from tool to technology and the conceptual switch? How do those two parts – speaking about technology and having technology – relate to each other?

BS: That's a great question. But before I try to answer it, I want to make things a little bit more complicated. As you mentioned, an exemplary situation for this American semantics of technology is MIT and, as far as I know, there is still a ring of ambivalence for Marx within the "T" in the MIT. Because when they named MIT, the T held an old meaning, which was very much alive in France until the 1960s. And that is that technology does not signify machinery, systems of machinery, and so on, but the meaning of technology is the knowledge of machines and tools and instruments; the knowledge, the *logos* that is already in there. So, in French until at least the 1960s, *technologie* meant primarily the science of technology, or the science of techniques, including the arts. Technē is both arts and technics. And in that

sense, the term technology appeared also in the German language in the eighteenth century. In 1777, it was introduced into the German discourse by Johann Beckmann, and exactly with the meaning of the science or even the history of technical practices, how to do things (think of the Encyclopedists, D'Alembert and Diderot). Beckmann writes in his *Anleitung zur Technologie*: "Technology is the science that teaches the processing of natural things, or the knowledge of crafts" (1780, 17). And interestingly, that term *Technologie* had replaced, in that meaning, an older term: art history. "Art history," Beckmann defines, "may be called the narration of the invention, the progress and the other destinies of an art or a craft" (1780, 18). So, the old term art history meant the same as the new term technology; and by this replacement, the term art history became free, was liberated so to speak, to designate something completely different in the modern sense to how we use art history now.

The story is more complicated than we usually think, especially if you think of the French tradition of an anthropology of technology, or what André-Georges Haudricourt (1988) wanted to bring about, *technologie humaine*, where he was speaking about technology as a human science. And interestingly, he invented the term *technologie culturelle*, which rings sort of like *Kulturtechniken*, right? (Haudricourt and Michéa 1968; see also Lemonnier 1983). We should keep in mind that our narrative needs to be diversified beyond the shift from an older European meaning to an American meaning, which then somehow became hegemonic.

But back to your question. Yes, the conceptual break with the old concept of the tool was implied by what you just described; American technologies as being in a condition of corporations, of systems being defined by standards, norms, and so on, in a sense made the term technology incompatible with the term tool. That is the conceptual switch. But who can say when the practical switch happened? Maybe it happened in the nineteenth century with Babbage, who realized that he could build his Analytical Engine only after he had changed the whole British system of manufacture. Or perhaps it had happened already with the Spanish colonial empire in the sixteenth century, when the royal officials realized that they could run their huge overseas empire only if they built up an infrastructure of standardized instruments and navigational practices. But it so happens that some people who talk about technology still do so as if technology and machines are tools. And that's something that we have to critically reflect upon.

RSD: In what you were saying, I noted a few different ways of breaking down the term technology. If we were to keep technē separate and just

focus on the second part of that term, I noted that it could mean knowing technē, it could mean the historical narration of technē, it could mean studying technē, it could mean doing – whatever that means, as in doing versus using – technē. So, what I'm hearing is: using is out, but what about all the others?

BS: But using is not out. Practice is not out. On the contrary, this is something that is very important to me, because it refers – at least in this country, Germany – to a recent turn in studying media practices and cultural techniques. We can talk about use and practice, surely that is important. And I'm convinced, more than ever, that it's a good thing to break up the monolithic concept of media into all these different techniques that you encounter when you open up this black box. But at the same time, to re-individualize these practices now would be a mistake. So, this does not mean that we go back to empirical social research, now applied to media, and that we just go outside and visit people and look at how they use a computer. Indeed, unfortunately, there are people who have understood all this in exactly that way.

Let me give a historical counterpoint to clarify. I think it is important to remember what Marcel Mauss (1973) had in mind when he coined the term *techniques du corps*, or body techniques. For Mauss, the point was not that every individual has his or her technique of the body. That is not a technique. You can have a practice and you can maybe have a skill, but that is not a technique. A technique is always superindividual; it is something that usually has a long cultural history that transgresses the consciousness and the abilities of an individual and the learning history of an individual. In other words, techniques are culturally defined, they are institutionally defined, and they are defined by media. There is this wonderful example when Marcel Mauss was watching how the nurses walked in the hospital where he was after the war. Something about the way they walk reminds Mauss (1973, 72) of something else. He eventually realizes that he had seen such a walk in American films. Which is to say that the way the nurses were walking made him realize that this kind of walk was imitating the way women were walking in American movies of the 1940s. This snippet is about media, cultural history, and institutions such as the military. If we stick with the idea of walking, we also find education implicated; think of how people learn to swim, and why people in certain cultures swim completely differently from others. This has nothing to do with an unquestionable individual that is somehow at the source of practices, and who decides freely how to use them. What is interesting here – this comes out of Mauss's

research, and has been adapted by the study of cultural techniques – is that we try to decipher the histories and the contexts behind those practices, and we try to find out where these techniques come from, how they have been formed, by what factors have they been formed, and so on (Siegert 2015).

RSD: I actually agree; this sounds consistent with what I meant when I said "using is out." The conventional sense of the individual subject, in all its consciousness and ability, unidirectionally using a tool – though one could argue that even in that case, these questions of utility are culturally, thematically, and economically determined – is out. And at least in the case of technology, one could say – as you correctly noted at the start of our conversation – that the model of usage is actually very complicated because there is no single subject in the middle. For example, let us take this scenario that you're talking about where the technique of that nurse's walk – which is in this case being examined by an observer – cannot be located solely within that particular woman's choice to walk that way, or one particular actress's choice to walk in some way in media, but even more in Mauss's ability to consume American films from the 1940s, to be in that place, and to be able to see the formal homologies in order to make that connection. It is, as you point out, beyond those individual instances. And the question of a clear directional utility gets complicated. I completely agree.

But I think it's still worth thinking about what those other modes contained within technology do. Let me put a few options on the table:

1.   Knowing, as in the knowledge of techniques;
2.   Narrating, from logos, as in the descriptive;
3.   Studying, that's denoted quite literally by the military engineering schools in France (*École Polytechniques*) of which MIT is a clear successor; or
4.   Doing, practices and things that happen in workshops, in factories, when we say "I'm doing something with technology" or in some cases "I am doing technology" (technologist, for example, is a term in the American TED Talk circuit), suggesting an action that's neither knowing nor studying but something different.

Are all these always collapsing within technology? Must we delineate? Or is it useful to maintain that ambiguity and ambivalence?

BS: I think it's important to see that in certain developments, all these semantic differences that we have talked about, are collapsing into an

environment that we call a technology, or technologies. As an environment in which we more and more live and become part of, technology is a milieu, and it needs something like an artificial distancing in order to deconstruct the term. (Now, don't get me wrong, I'm not saying that this is always necessary, because there are great scholars of technology out there who describe technology in its own terms.) I think it is very profitable for us to see how, not only in semantics but also in fact, techniques turn into technologies. For instance, digitization. You can think of calculating turning into machine-based computing largely by digitization. Now I have to correct myself all the time because calculation has always been connected to machinery, and here again we could start a discussion about what a machine is, what the difference between an instrument and a machine is, and so on. (A machine according to Michel Serres [1995, 84-91] is something that works on its own. Therefore, a roof is a machine, not an instrument). But at the moment, I would just like to highlight this methodological point – not to give up one term for the other, but so that we study the intermediate zones that transfer from one to the other. For instance, when a certain technique is digitized, then that has a recursive effect on the techniques themselves. So, the techniques do not disappear – we all know that – but they change and they become something different.[1]

Technical Media

RSD: I agree. But if I were to move half a step away from just thinking about technology, I would now add the term "media" to the conversation. On the one hand, I am thinking about the German (more specifically Kittlerian) notion of technical media (a term that then becomes "new media" in some different way within the American context). On the other hand, I often use the phrase "media technologies" instead. Do you think we are looking at the same things when we say media technologies instead of technical media, or are we looking at different things, or are we looking at things differently?

BS: Great! In the Kittlerian sense, all media are technical media, no matter what historical period we are looking at. As you know, he speaks about

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1   Note by BS: One thing missing from this conversation is a discussion about the term technē and how it relates to physis on the one hand and to *Technik* on the other, especially when it is considered in the context of Heidegger's claim that in modern times *Technik* has replaced metaphysics.

storage, addressing, and processing as the three media operations, and all these media operations have always been technical. That doesn't imply any statement about *what* technique or what *kind* of technology. For Kittler, the Greek alphabet too was a technology in this sense, because it turned speech into a code of articulation, which is very artificial with regard to the "natural" (and "natural speech") (Kittler 2006). So, we are storing speech by the means of an alphabet, which is a technical medium. And transmission is a technicality. And processing (which for Kittler came much later), the ability to process data that are stored and can be transmitted, even more so. So, in Kittler's sense, media have always been technical. That's why he makes the funny distinction between technical media and high technical media. With high technical media he always meant the media that were able to process sensory data as such – sound, technical images, and even letters. High-tech media for Kittler were the media that destroyed the monopoly of the printed book and its rule over the senses: gramophone, film, typewriter, and later the computer, and other, newer high-tech media; that is in question when he speaks about our highly technologized age. For him, that was somehow a useful distinction (Kittler 1999; see also Winthrop-Young and Van den Oever 2014). I think the distinction still makes sense, because to just speak of media technologies always calls up this corporate sense of media. If I hear the term media technologies or media technology, I think of this assemblage of institutions, technical systems, social context, political context, even geopolitical context, and I immediately think of something more global than local. But then, to be fair, I hardly ever even use the term technical media.

If you connect media so closely with technology, the risk you are running is that people may understand media as a phenomenon of the twentieth or the twenty-first century. And for me, that's clearly not the case.

Maybe here we also would have to talk about the difference between "medium," "mediums," and "media." Although it may sound a little bit strange to Anglophone ears, Kittler would maybe have preferred – if he knew English better – to speak about "technical mediums" in order to distinguish them from "elementary mediums."

History and Anachronism

RSD: I find it interesting – and somewhat paradoxical, if you allow me – that the notion of media (or mediums, if, as you rightly point out, it was more technically rendered into English) comes from these basic definitions of

transmission, storage, and processing as the defining features. So, we now have a thousand books calling something X media, and all you need to show in the introduction is how they store, process, and transmit, and then boom … I can do whatever I want in the rest of that book. On the one hand, it is these ideas about transmission, storage, and processing that are applied to the Greek alphabet. But on the other hand, we also somehow find a resistance to call previous kinds of tools technologies. What I'm trying to understand here are the limits, in *your* opinion, of applying words and vocabularies that explicitly come to us from our recent past. Information is another such term that I have significant difficulty with because it arises in a certain context, it applies to that certain context in a certain way. And then today we have, say, airport book authors going back and saying everything was always information, much like the case of media scholars for whom everything was always transmission, storage, whatever. (There are times that I myself fall into that trap, so this is also a self-critique.)

So, some of our peers apply these recent terms to the longer histories that we all study, but we still bristle when that is done (possibly shoddily) in popular writings, weaving a kind of progress narrative, one where humans were always already distributing information. Help me understand the difference.

BS: *laughing* I will make an attempt.

On the one hand, we have this nuisance of popular (and popularizing) literature that uses recent technological terms metaphorically in order to tell us that ancient times were also information societies. I don't know whether this is still going on, but there was a time not long ago when everybody talked about the internet of this or that. This way of projecting technological terms into the past, of course, erases historical specificity, historical materiality; letter-writing is definitely not the same as sending emails. But I would distinguish this from another strategy, which looks a little bit similar but nevertheless tries to do something else, and whose purpose is something else. This happens if you use, for instance, terms of computing technology, terms that come from computer hardware and computer operations, to describe historical discourse networks; for instance, the reading and writing cultures around 1800, or in my case, Spanish bureaucracies of the sixteenth century: I have quite extensively used terms from the computer age to describe those bureaucracies. Why is this not the same? Because here we are not using a metaphor to tell a story of historical similarity. The point is to reveal that historical data processing can also be described as data processing, and therefore these terms are at least heuristically helpful. The

aim here is not to say there always has been an internet; that is bullshit. All this work has been done recently by John Durham Peters, for instance, who also has come back to the history of bureaucracies. He tells us that there is, for us media historians, something like a history of data processing, which is important not because it's just a history of data processing beyond IBM or Hollerith, but because it is a history of data processing by which the rise of concepts like data, addresses, commands, etc., themselves is written (Peters and Wickberg 2022). In other words, these terms have a history by themselves.

What is a datum? When do data, for the first time, appear in history? Why is it necessary that data appear in history and not just gods, flowers, and nature? So, what does it mean? What are the technical or discursive preconditions under which something can appear like an address? What sets the address free? You have been working so wonderfully on the topic of addresses, so you know better than anybody else that there is a history behind the address (Dhaliwal 2022b). The address is not just an ontological category. Addresses are something that had to be abstracted from the whole wooly situation in which addresses were formerly so entangled that you couldn't even recognize what an address was. But there is a certain point in history where something like an address becomes operationalized and thereby can be recognized as an address, because it was then used as an address. So, you can pursue this in many, many different contexts. And therefore, it is useful to not be a complete historicist.

RSD: *wild laughter* Oh Bernhard!

BS: Yes, it is sometimes good to be a historicist. Sure. For strategic reasons. For instance, because we don't want to hear about the Renaissance computer and we don't want to hear about the Enlightenment internet. Therefore, if that comes up, yes, I tell you that I'm a historicist because then I would insist that "no, there are differences!"

I think the people that talk about the Enlightenment internet are not media historicists; they are Enlightenment people. They want to tell people that "Look, already Enlightenment was such a great thing! They already had something like an internet," as if we need the internet in the Enlightenment to believe that Enlightenment was something great. But the media-historicist strategy here is to reveal that there are media histories of data, of addresses, of commands, of storage, transmission, and processing that we can tease out if we make anachronistic use of these technical terms.

Etymology and Linguistic Change

RSD: I think I'm starting to see the contours of both my agreements and disagreements, because it seems to me that what is most pertinent in this conversation is a question of etymology and linguistic change, one that we started this conversation with. Now, in some ways, I agree with you. But in other ways, I think my problem is that I'm following the languages closely and that I'm interested in going only so far as the linguistic and etymological will take me, primarily because I see these to be – in Raymond Williams's (2014) sense – cultural distinctions: borders that I would not cross without a different guide. That different guide has to be a different word, not a different sense. I think commands exist – even if there is some change in sense historically – in a bureaucratic sense, and in all of those senses that you just pointed out. And addresses exist in history. There, I think I completely agree with you. But where I draw the line is actually the sort of Kittlerian sense, because transmission does not exist in that same sense historically, and processing definitely does not exist in the same sense through time. So *that* is where I think it is actually anachronistic. But if we follow, as you do, the history of bureaucracy or, as I am doing, the history of walls, I think that is actually not anachronistic; you can still pay attention to how the wall changes as a material thing, or as a semiotic thing, historically, culturally, geographically. And you can still come out on the other side with something useful. But I think where I draw the distinction is where language does not take me, because if I'm calling something medieval processing, I think I'm doing the Renaissance computer move.

BS: But *why*, I want to insist. Okay, I would agree, and Kittler would agree too, but I think he also would say that the Middle Ages had no possibility to process data. Of course, there is the possibility to store data; a great problem in the Middle Ages are addresses. And commands were not implemented – as you would have said – into the medieval medium system; commands were human beings (or God, but not very often). But *I* wouldn't have a problem if, say, a cloister in medieval Europe had the means of storage of knowledge; they had libraries, they had handwritten books, manuscripts and so on; these were the media of storage. So, where's the problem?

RSD: I see your point. I'm actually at some level okay with the Renaissance computer framing (or in this case, medieval processing), as long as you tell me that that is a rhetorical pitch for what you are doing, and not your historical finding.

Fig. 6.1: Premodern transmissions: Philip II of France receives a message from the Pope asking him to join the crusade. *Grandes Chroniques de France*, fourteenth century. Paris, Bibliothèque nationale de France, Département des manuscrits, Français 2813, folio 227 verso. Source: Wikimedia Commons.

BS: For me, the problem with the Renaissance computer, which is actually a book title, is that, while it is a very nice thing to look at the materialities of the Gutenberg era and find indexing and all the materialities of the printed page, you shall not find computing. It does everything else, but the only thing that the printed book does not do is compute anything.

RSD: What I'm trying to distinguish here is between what one finds in the historical record (or what one argues theoretically) and what one's rhetorical pitch might be. And that is often distinguishable if one were to pay attention to modes of academic argument-making, and what gets published. So, maybe editors were really interested, in the early 2000s, in a certain kind of argument that could talk about a medieval internet or something like that. So, yeah, you just slap that into the introduction. And I'm honestly perfectly fine with however people pitch their work, because I understand marketing, which is a cultural technique in its own right. So, the distinction that I'm drawing out is at one level rhetorical.

But the other level – and here is why I think it's okay to say cloisters were storing knowledge, but not that they were processing, or even transmitting – involves me following a Raymond Williams-esque or a Derridean mode of thinking – where the word itself appears as a medium (Derrida 1976).

Now, in this case, the retroactive understanding of practices in churches in the Byzantine era as being possibly processing or transmitting as we know it goes against my firm commitment to take the word seriously as a medium. Because if words change in a certain way, then something in the culture has changed. Which is why walls and bridges and commands are fine, but transmission is not. Because that is not what they would have called it, right? There are other ways of saying it, "move this from here to there," for example, in which case movement, sending, possibly all of that is fine. That's the precise, very fine line – I am nitpicking here – that I'm drawing, which means that I've always found problematic the tripartite definition of media through storage, transmission, and processing. Because it demands that, methodologically, all media should have had the sense of something that I'm taking from the present. You can say something *like* transmission, something *like* storage, something *like* processing, and I think that would be a little more accurate. But to say something *is* storage or transmission …

BS: But you could use something else. There's another interesting thing that you yourself open up by your critique. The Latin etymology of *transmittere* makes me at least assume that ancient times also had a certain understanding of what transmitter means. And maybe it is not the same, maybe it's something completely different, I haven't looked it up. But maybe it's not sending, maybe it's not moving something from here. Maybe it's the way the angels speak to human beings. Maybe *that* is *transmittere*. Wouldn't that be a possibility that you could accept?

RSD: Absolutely, yes. But that's precisely why I think the collapse and the distinction-making go hand in hand – if I can indeed make a strong case for some kind of fundamental continuation with *transmittere* in the Latin sense, which itself has, I think, other genealogies. It seems as though (looking quickly at an etymological dictionary) before the 1400s, *transmittere* was not used as a term, even in Latin.[2] So, I would say, yeah, you are allowed to

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2   Note by RSD: After this conversation was transcribed, BS pointed out that this was incorrect. While transmitter was only introduced into modern English via a circa-1400s borrowing from Latin, *transmittere* in Latin (from *trans-* "across" and *-mittere* "to let go") has been used since at least the third century BCE. See transmitter and *transmitto* in Olivetti (2003-2023). The research

call it transmission from 1400 onward because in that case, it's a history of transmission. But those are the strict bounds that I would put on myself. If it is indeed the case that the word was slightly different before that, and I can still make a strong case for it falling within the same fundamental similarity of history, then yes, that's fine. What I am vehemently opposed to is the anachronism where you apply something from now and then say this is what it was all along, because *that* to me is indistinguishable from the rhetorical move made when calling something in medieval times the internet.

I think that kind of move is one of the reasons that in the 1990s, and perhaps even before that, German media studies became so powerful as an institution – if you don't mind me saying this – because its scholars were able to make really robust rhetorical cases for why they (experts in history and culture) should be the ones studying these technological things. And I think that's where that distinction breaks down.

BS: If you go back to early Kittler, for instance, you will see that what made him really great (and I think everybody today would accept that) was that in the 1970s and 1980s he described the discourse network of literature around 1800, but not in the same terms as this discourse network would have described itself.

So, in *Germanistik* (German literature studies), you would normally use the same terminology that the epoch had used to describe itself, in order to describe that epoch. The Germanists talked about love, soul, and beauty, and they thought they could analyze art around 1800 by using the same terms that art had used for itself. And Kittler said, No, we need to find another language – a technical language – if we want to get out of this crazy feedback loop! No, what you are studying has nothing to do with love. It has everything to do with media technology. And love is nothing else than some kind of media technology! So, the loop was broken and people got so angry. But that was necessary in order to change a whole discipline and get away from this idealistic, narcissistic relationship between literary scholars and their subjects (Kittler 1999). They were all *so* in love with Goethe and Schiller and Novalis, and so they were themselves being little Goethes and Schillers and Novalises in describing the big Goethe and the big Schiller and the big Novalis. I mean that old model could have gone on endlessly.

error mid-conversation is regretted. But this further complicates the timeline, in my opinion; was transmission always transmission? Is it linguistically (and spatially) situated in Latin and "the West"? Do the temporal boundaries ever show up before, say, the third century BCE, if not the fourteenth century CE?

RSD: But don't you think, Bernhard, that replacing Young Goethes and Schillers with Young Kittlers was a move that itself can also be called into question?

both laugh

BS: Maybe it was. I think for everything there is a time and place. The important thing for everyone then is whether you find a way out or whether you get stuck in such a cycle.

RSD: Let us not get stuck in cycles, on that we agree!

Allow me to explain. I actually do genuinely draw a distinction between the intellectual framework in which Kittler is intervening and the intellectual framework from which I took up cultural techniques as a useful mode of thought, which is largely of your creation. In my opinion, the latter does the same thing but differently; your work builds these longer bridges to the past, not solely on the terms of the past but because the terms themselves show you a way of building that bridge from the past to the present. I see a small distinction here. I'm completely with you in the history of bureaucracy (and sometimes those terms have long lives!), or in the history of technics, because there is no anachronism there. One can be pretty specific and one can also actually apply these terms trans-historically because the Greeks were using them and we are also using them, just in different guises. And it's the same thing with, say, coding. This is also illustrated for me in your excellent work on AC current, which teaches me to make such jumps and go to the Greeks or go into the history of philosophy because it is already right there with you through your subject material. Those jumps have constraints on them that are already given to us by the word and its world, the language used and the discourse around it. But I do not always see that sensitivity in all Kittlerian approaches to history.

But this is perhaps – in the larger scheme of things – a very minor distinction for some.

Mediation and Techniques

RSD: So, let me, in the hope that it will be more productive, pose one penultimate question instead. This is a residual query from our conversation around technical media. What, for you, is the relationship between media and technology, and mediation and technique?

BS: That is a complicated question. Of course, mediation is a very general term. And if you think about mediation without any combination with media or technology, what's the first thing you think of?

RSD: Hegel!

BS: Yes, you think of Hegel. And one important thing we've learned from Hegel is that most primary things are not as immediate as common sense suggests or as people may think. If anyone is ever tempted to think that "the objects around me are given to me immediately, without any mediation," they are wrong, for it is exactly the other way around. The utmost common and usual things in my perception are the most mediated! So, it is only because our poor consciousness is so non-reflective that we can think that we have the whole picture if we just have it immediately. But Hegel was able to show that such a thing is the poorest picture; it is not very rich. So, yes, everything is mediated.

The term mediation, if you use it as such, is a philosophical one with its own, very general history. One connection between Hegel and media studies could be that media studies somehow learned, or perhaps still has not learned, the following lesson from Hegel: that mediation is not secondary; mediation is always primary (that which is of the first order). So, there is not first A and B – a sender and a receiver – followed later by mediation between the two (or a lack thereof). No, there can only be a sender and a receiver if you have mediation! This, I think, is the fundamental law of media studies. Or let me put it this way: if there are media studies at all, then that should be the fundamental law.

Now, let us come to the other term: techniques. Techniques always have a mediating quality. They produce mediation inasmuch as they generate a network of different agents and actors and operations and practices and so on. We can call this an actor-network. I am insisting on this, largely because there is another term that is sometimes used in this context: "action." Now, one might ask, what is the difference between techniques and action? Are all actions techniques? Do all techniques imply actions? And what is implied in the term action? I am reluctant when I turn to actor-network theory because in it we have a somewhat unreflected concept of action.

RSD: Totally!

BS: It often appears to me that actor-network theory just replaced the unreflected use of "subject" and "object" with an unreflected use of "action." Now I am fine if we abolish subjects and objects, but instead now all we

have are these actions, actions that seem unquestionable, as if they emerge from nowhere. And I always have a problem with things that emerge from nowhere! Which is why I'm making things so complicated when I talk about techniques, because I don't want to be understood as saying that techniques are just yet another word for actions (or even skilled actions). Techniques involve much more. They take place in an environment. They presuppose some kind of milieu, which can also be a medium. They involve objects. If we come back to calculation as the technique, you will see that calculation usually involves some objects, a setting, a situation. Now, that might be a good word to think about: a situation.

RSD: Yes! I couldn't agree more.

BS: Techniques are always situated. And where are they situated? They are situated within an ecology of materials, agents, actions, agencies, and so on. They are not simple.

   The sense of mediation that we just talked about is precisely the situation in which we need to describe a technique. This situation is the place where mediation takes place, so to speak. That, in any case, is my spontaneous attempt to bring mediation and techniques together in thought.

   Mediation is always involved when we talk about techniques. If we go back to André Leroi-Gourhan and think of a cycle of operations – which is the way he would explain an action or gesture or even a tool – then we cannot think of this cycle of operations without the term mediation because mediation is exactly what happens in a cycle of operation; something is mediated in a recursive way between object and brain, exteriorization and interiorization (Leroi-Gourhan 1993; see also Leroi-Gourhan 1943, 1945). By exteriorizing something mental, a mental operation, things that I do with my hands – in other words, doing, and doing things with other things – become interiorized. And that is mediation! Everything that we have inside is mediated and everything that is outside is mediated.

RSD: I completely agree with you. I have a whole nascent theory about how actor-network theory cannot have a concept of mediation.

BS: It never wanted it!

RSD: Is that so? Latour does use the term mediation.

BS: No, mediator! He uses the term mediator.

RSD: I see your point. And I concur. For "mediator" there does not mediate in the way that we are talking about here. The whole middle, for Latour (2005), is just yet another node like the ends of the network. And so, functionally speaking, the middle collapses onto the ends; it is not distinct enough for it to be a theory of something that is not a network end, for it to be a theory of mediation. And it perhaps can never be so in that framework.

Allow me to circle back to the reason I asked this question. In mediation, we have something that fundamentally brings together, and is shared by, the two genealogies that I am invested and interested in: one that's coming from Hegel and another coming from the historical-materialist tradition through Marx and Althusser among others. I have always wondered if the one that is coming from Hegel is the mediation that shows up in media studies in the late twentieth century. Maybe there are some interesting tensions, and overlaps, between these two senses of mediation? My somewhat leading hypothesis is that this distinction had something to do with a certain concept of technique or technology, which may be understood differently within the two traditions. But I am not certain; this is still thought in action.

BS: It is. In my opinion, the grounds for that hypothesis are not very secure. What I provided is just one possible way of conceptualizing the link between the Hegelian concept of mediation and the more media-theoretical concept of mediation. We should not mistake that conceptual link for a historical reconstruction of how ideas travel.

RSD: Interesting. Maybe, then, this is also a distinction, as you already pointed out, between "mediums" and "media"? A distinction that should be taken seriously if we are not to collapse all genealogies of mediation into the same configurations. This, perhaps, more than anything, calls for more situatedness (cf. Suchman 1987; Haraway 1988). Perhaps situatedness appears closer to the way mediation is understood in media studies? I concur with your call. We should not collapse the genealogies at all. Things don't run straight, not in this world.

Cultural Techniques and Institutions

RSD: My final question has to do with the relationship between institutions and cultural techniques. I was reading your excellent conversation with Geoffrey Winthrop-Young in *Artforum*, in which you say the following:

[T]he concept of cultural techniques links up with other disciplines, for instance anthropology, or the history of religion, or legal history, or ethnology. Take the example of legal history: For thousands of years, there have been written histories of law, from the Romans to the British Empire. And if you look at this as a legal historian, what do you do? You study the institutions. You study the written wording of the laws and the commentaries, and you connect it to the development of these institutions. But if you looked at this from the side of cultural techniques, you would do nothing of the kind. Instead, you would study the concrete techniques by which law is processed, and then you would see that law is not an institution. It is not in the institutional text. It is in the files – the processing of files. One of the earliest scholars who contributed to the field of cultural techniques, Cornelia Vismann, demonstrated precisely this in her beautiful book *Files: Law and Media Technology*. It's a great example of what cultural techniques do differently. (Winthrop-Young 2015; cf. Vismann 2008)

In light of this and also how we have discussed institutions within this conversation, how exactly do you see the relationship between institutions and cultural techniques? What do institutions do? Are institutions the locations for techniques? Are techniques themselves manifested in institutionality? What is the theoretical model for you?

BS: When I said that, I was trying to give an example of how cultural techniques, in this context, are distinguished from other academic practices. I go and look at the material processes, and the materialities of communication, as the basis of law. I go wherever law is produced, not where law is interpreted.

If, instead, we look – not with the intention of distinguishing cultural techniques from other practices – at cultural techniques *themselves*, what is the role of institutions here? It may be worthwhile here to go back to the Roman sense of *instituere*. If you think of the work of Pierre Legendre, a student of Lacan, a lawyer and legal historian, for him, institutions are very important (Goodrich 1997). He, of course, looks at institutions from a psychoanalytic perspective, but he also goes back to what the Romans meant by *instituere*. And a key turn of phrase there is *vitam instituere*. So, life, in order to *be* life – that is political life, civilian life, and not biological life – has to be instituted. And it is usually instituted by paternal law. It is instituted by the fact that you are given a name in the first place. What I learned from that, and this became very important to me, is that it is part

of the work of cultural techniques to study how subjects are instituted by certain media practices. This leads us, of course, also to the Foucauldian question: how, in the course of history, are subjects produced? And in this case, we could ask how subjects are turned into institutions. This then gives us a whole history of the individual, at least within Western culture. According to Foucault, until modern times, the only individual was the sovereign; everyone else was *not* an individual. Only the king, to put it simply, was an individual, and only the king was a subject. Then, in modern times, with the rise of bureaucracy – as states started to care about their population and subjects – it also became necessary to include subjects into institutions and to make and institute subjects. In Foucault's work, this happened by making them speak of themselves and document their subjectivity. To come back to your question, if we look at what the study of cultural techniques has to teach us about life – in terms of human life and human subjectivity – this sense of institution becomes important.

RSD: Would it be correct, then, to characterize these two approaches – legal history and a study of the cultural techniques of law – as the difference between an institution as an entity and an institution as a practice? It seems to me that the distinction that you are drawing is between the study of the history of the court and the study of the history of the institution (of the court) as a practice; the latter happens when the files are brought, and when the orderlies are asked to stand on the right, and when the gong is rung, and so on. Would that be fair as a characterization?

BS: Yes, that would be pretty fair. Within the context of law and legal history, this distinction is easier to draw because, in this case, we have a very clear-cut definition of what institutions are. I mean, one of the books of the Justinian Codes is called *institutiones*. And this is exactly what legal scholars have in mind when they talk about institutions. First of all, it is a codex. So, if you study institutions, you study codified law. But that is just one project. A totally different project would be not to study codified law, but to study the practices by which the codified law is put into effect, how it is enacted. And *that* is a totally different story.

RSD: I completely agree, and I love that framing. I think it's a methodology of something *in action*, as in the dual, related sense of when things are enacted and in action. We must study enactions, in actions. This approach, I reckon, is not coincidentally something we both share in the context of our newer projects (cf. Siegert 2022; Dhaliwal 2023a).

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PART III

Theories of Media

7. Protective Media*

Francesco Casetti

Abstract

Many contemporary media function as filters that protect us against external dangers, rather than as tools that help appropriate the world. From surveillance cameras to plastic partitions in pandemic times, from domestic screens to Zoom conversations, all build a sort of safe harbor from which to better manage reality. Consequently, mediation is no longer an "extension of man," as Marshall McLuhan put it, but a more complex process, in which contact with the world relies on some kind of distancing, and in which grasping reality also means recognizing the threats it may pose – threats that are, more often than not, the result of human action on the world. This chapter explores the widespread presence of *protective media* in our contemporary media landscape, with its philosophical implications and its political consequences.

Keywords: media, protection, screen, environment, digital

There is a typology of media whose purpose is to protect individuals from the dangers of their surroundings, without completely severing them from the world. This typology apparently overturns Marshall McLuhan's famous motto – "media are an extension of man," where "extension" implies a wider exposure to the world along with a wider range of action[1] – and instead

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1   McLuhan's motto is included in the title of his 1964 book: *Understanding Media: The Extensions of Man*. In the first paragraph, he explicitly connects the idea of extension to the idea of increasing human reach. Extension applies also to media that can be seen as forms of shelter, like the house: "Housing as shelter is an extension of our bodily heat-control mechanisms – a collective skin or garment" (McLuhan 1994, 123).

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proclaims another logic: media are shelters that allow man to find a safe place from which to better negotiate reality. Examples are numerous and varied. They not only include the surveillance cameras that limit outsiders' entry into a building; the checkpoints that prevent the introduction of hazardous objects through the gates of an airport and then on a plane; the plastic partitions that keep citizens relatively safe in public spaces during pandemics; or even the GPS devices that help drivers avoid inconvenient routes. Examples also include television, with its capacity to deliver news from a turbulent world into a domestic space; cinema, which exposes spectators to extreme realities in a comfortable theater; and communication platforms like Zoom and Webex, which allow users to stay in touch while avoiding physical contact.

What these disparate examples have in common is not only a general intention – to defend human beings from impending threats – but also a set of precise operations: they all present media that spare individuals from immediate contact with reality, filter this reality, and then allow for a secure re-inclusion of what has previously been severed. Protection does not imply a simple isolation from a danger, as apparently happens with devices such as safes, locks, or passwords, aimed at safeguarding objects, assets, and texts. Especially when it involves humans, protection also implies a secure reconnection with the world from which they have established distance.

This interplay of severance and reconnection raises several questions. At stake is not only a peculiar spatial configuration and an unusual connection with reality. *Protective media* challenge the very idea of mediation. Instead of a progressive apprehension and an alleged appropriation of reality, they suggest a threatened subject, a challenging world, and a technological shelter. What ideological implications are there in such a design? The "apparatus theory" of the 1970s wanted to deconstruct the ideological effects of media, and especially cinema (Baudry 1986a, 1986b). It is time to resume such a task, knowing that media are no longer compact and univocal "machines," but an aggregate of dispositifs and operations, and that ideology is no longer a mere process of "subjectification" of individuals, but also involves the manipulation of the environment.

In the following pages, I explore the operations that characterize protective media, as well as their ideological effect at large. The analysis of how these media not only assign specific values to the ideas of fear, danger, and the interior, but also ultimately "produce" the premises of their own action will bring the discussion to its end.

Modeling the Space

The main feature of protective media is the fact that they work within and upon a physical space. These media interact with the territory in which we live; they localize the dangers that affect us, provide distance from them, suggest safe forms of reconnection, and in some ways, they clean up our milieu. From this point of view, and for better or worse, protective media are intimately environmental (Hansen 2015).

The space they tackle is that which immediately surrounds them: for surveillance cameras it is the perimeter of a building, for a checkpoint it is the premises of a restricted area, for the GPS it is a network of routes, and so on. The "immediateness" of the surroundings can change; what is nearby for a radar is distant for surveillance cameras. Every medium has a space that it considers within its purview and on which it legitimately exercises its sphere of action.

The first operation that protective media perform on the space is to create a *partition*: there is a portion of space that they carve out and transform into the site of a positive action, and there is a portion of space that they cut off and keep at a distance. Consequently, we have an inside, well-marked by a border, and an outside, which can be kept apart or left behind. In general, the separation of inside and outside creates a contrast between a space which is either private, or sacred, or autonomous, or ruled, and a space that is common, or profane, or heterogeneous, or unconstrained (Brown 2010). Here, instead, what emerges is the idea of a *space of retreat* that is opposed to a *space of exposure*. The inside is a sort of refuge, the outside a threatening zone. This is quite clear in the case of an airport's restricted areas or in the case of zones under control by surveillance cameras. Yet it also applies to the homes in which individuals follow the latest news on a television set as opposed to the world from which the news comes; to movie theaters as opposed to the urban milieu where they are located; and even to the ideal bubbles in which individuals immersed in a digital screen seek respite as opposed to the often-demanding environment in which they live.[2] In all these cases, an axiology (safe/dangerous) merges with a topology (inside/outside).

2   The technological devices of some protective media also contemplate a sort of "inside of the inside"; it is the projection booth of cinema, with respect to the movie theater; and it is the hardware of a computer, with respect to the screen and the bubble inclusive of the user that the screen elicits. What we have here are "double thresholds," whose function must be specifically analyzed.

Between the two spaces, there is no lack of contact. On the contrary: despite the surveillance cameras, individuals enter and exit from protected buildings; despite the GPS, drivers continue to travel the road; despite airport checkpoints, passengers flock to the gate; despite their immersion into a digital screen, users do not forget their physical milieu. Borders split, but do not seal. While severing two different areas, they let these areas remain connected. Simply, there is no longer an "open" space in which individuals are exposed to accidental and unpredictable events. There is a threshold that differentiates an inside and an outside, and there is some sort of *filter* that regulates the flow of bodies and information between the two spaces and that allows individuals in enclosures to be in touch with the world out there.

In many cases, these filters coincide with screens: the display of GPS, the set of screens in a surveillance booth, the plastic screens in offices and shops during the pandemic, the silver screen of a movie theater, the digital screen of an online conversation. This is deeply coherent with the original meaning of the word "screen." Since the fifteenth century, *screen* (Murray 1914), as well as the French *écran* (Littré 1873), the Italian *schermo* ("Schermo" 1981), and the German *Schirm* (Grimm and Grimm 1899), and, though in a different way, the Chinese *ping* (Li 2022), have denoted partitions that, while keeping something apart, nevertheless allow it to penetrate a protected space. In particular, the English word referred to a contrivance for warding off the heat of fire or the draft of air in a room that nevertheless needed heat and air, and to the device used in the sifting of grain or coal. Visual denotation came later, with the optical devices of the late eighteenth century, like the phantasmagoria and the magic lantern.[3]

The presence of screens can induce the idea that the gaps in the divide between inside and outside are a sort of window. However, these screens do not grant transparency, as windows do. They grant a passage: the outside is no

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3   In the eighteenth century, the optical connotation of the word "screen" was relatively rare. An exception is Henry Baker, who speaks of "screen" and "paper screen" for the surface on which a magnified image appears (1744, 23, 25-26). A turning point is offered by two notices that refer to the patent of the phantasmagoria granted to de Philipsthal in London in the early months of 1802 ("Specification of the Patent granted to M. Paul de Philipsthal" 1802). The two notices ("M. de Philipsthal's Patent" 1802; "M. de Philipsthal's Patent (of the Lyceum, Strand) for the Invention of Representing in a Dark Scene Human Figures in Various Characters, Size, etc." 1802) read "transparent screen" instead of "transparent body," which is the term employed by de Philipsthal in his patent. At the time, the word "screen" usually meant protection, filter, or divide. The substitution of the old term with the new – authorized by the fact that in the phantasmagoria the screen had to hide the projector, before hosting the projected images – and the immediate success of the new term allow us to detect the time and context in which the visual connotations of screen started to become dominant.

longer directly attainable, and yet it can pour inside, stripped of its dangerous potentialities. In this sense, screens here are conduits rather than windows; they provide regulated paths rather than full visibility. In the flow of bodies and information between the outside and the inside, it is the permeability of the divide, and not necessarily its transparency, that really matters.

This permeability changes the meaning of both the borders and the enclosure. What was kept apart or left behind is not lost: it can come back, even if no longer in its pristine state; and in any case it is always out there, ready to exert some kind of influence. The consequence is that the line of separation between inside and outside is more than a simple divide: it is also an *interface* that puts in contact two worlds that are ready to interact (Galloway 2012, Jeong 2013). And the enclosure that houses individuals is more than a shelter; it is also a *niche* (Tomlinson 2018) that, while keeping a sort of autonomy, is nevertheless part of a wider environment.[4] The outcome is a mechanism that balances distance and proximity, direct acceptance and possible withdrawal, intervention and caution. The fear of being exposed to the world finds a positive answer in a form of protection that does not produce isolation.

Reconnecting with the World

Thus, protective media serve as a divide between an inside and an outside, and a conduit that reconnects the two spaces. This configuration allows what has been severed to be still present: borders are also points of exchange, and enclosures also belong to a larger territory. But what about the world when it comes back?

First, it is a world which, returning, carries with it the stigma of having been set apart. This state reflects a logical necessity. Indeed, coming back implies having gone away; the prerequisite of a reconnection is a separation. In this sense, the world that protective media make reappear "here" is in some way still "out there." It represents a typical example of an *excluding inclusion* – the situation we create when we appropriate something that we continue to consider alien to us. This apparent paradox is at the core of our mediation with the world: coping with reality always requires a previous split from it. A relationship implies a distinction that can be overcome; mediating means dealing with something that has been placed at a distance and that we now engage. From

4   The *niche* can take the form of a *bubble* like the one that, according to von Uexküll, defines the *Umwelt* of a human or an animal (2010, 43, 53). For a discussion of the spatial qualities of the *Umwelt* compared with the milieu, see Pollmann 2018. On the bubble, see Sloterdijk 2011.

the rift between a subject and a manipulated object that Flusser (2011, 6) sees as the beginning of our negotiation with the world, to the micro-temporal intervals that, according to Mark B. Hansen (2015) and Shane Denson (2020), characterize twenty-first-century media, what we have is a fissure that must be fixed. Protective media make this situation explicit. This is why the world they offer – from the phantasmagoria's apparitions to the GPS's maps – tends to have a ghostly face: it tells us how excluding inclusions are inevitable.

Second, the world that comes back is no longer the rogue reality that one may meet outside; it is a filtered reality, which has lost its potential dangers. We can also say it is a tamed reality, which has been subjected to a principle of discipline. With the GPS, it has become a network of available roads; with surveillance cameras, a collection of harmless bodies; with cinema, a piece of reality transformed into a story. In all these examples, the world has not only been purified; it has also turned into a well-structured, functional, and intelligible reality, however complicated it may be. We reconnect with a universe that is at once safe and docile.

This tamed reality mostly reappears in the form of screened images or sounds. The two words, "images" and "sounds," do not necessarily refer to representations in the traditional sense. On the screen, we can have pictures that reproduce the likeness of the world (movies are a good example), or even that are actual traces of it (cinema is still a good example, when non-digital). But we can also have abstract reconfigurations of reality, such as that of a screen that contains only a list of data. We can equally have symbolic replacements of reality, as in the case of the logo that defines the participants in an online conversation when they don't want to appear with their true face. And we can have simple hypotheses about reality, as in the universes of video games, in which actual physical laws are suspended. That doesn't mean the world stops turning to us again. If we consider "images" not as the "replacement" of reality, but as forms of "appearance," as Emmanuel Alloa (2021) argues in a broad reconstruction of Western philosophical approaches to the topic, then all images stand for reality, whether they are a mere replica of what happened or foreshadow a possible state of things. In both cases, they are moments in which the world in its many faces becomes present and graspable to us. What enclosures make available through the conduits that keep inside and outside in touch are iconic or aural "appearances"; as such, they always reconnect individuals to the world from which they have been disconnected.[5] As a result, individuals

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5   This raises the question of the "truth" of these images in relation to actual reality. The issue deserves a specific discussion; however, so far, the idea of mediation invites us to go beyond the

can avoid direct exposure to the outside world, with its actual or potential dangers; they can enjoy this world through images and sounds within a space of retreat.

At the same time, many of these images and sounds are available thanks to technological dispositifs, and this implies a further variation in their nature. According to Flusser, when produced and spread by a technological apparatus, images – and we can extend the argument to sounds – cease to be synthetic depictions of the world like those that we grasp with our senses. Instead, they become a "mosaic" of individual dots – the grains of the emulsion in the photographic film, the pixels in a digital picture – whose final configuration is based on a sort of algorithm (Flusser 2011, 15-22). However, this does not mean that technical images have no referent: they still denote a state of affairs, but not necessarily because they contain traces of something they encountered or because they retain a resemblance of something we directly experienced. Indexicality becomes more sophisticated. If we think of today's digital images, the metadata that underpin them – including their geolocation indexes – are a good example of how these images still have strong links with factual realities. Despite their "artificiality," through them we still look at the world.

Innervating the Space

This "artificiality" testifies to what extent technology is pervading our lives. Indeed, not only images and sound, but all components of protective media reveal the growing role of technology. This is especially true for the space within and upon which protective media work. Think about our initial examples, from surveillance cameras to online conversations. Direct knowledge of a territory is coupled with a stream of screened data; the proximity of face-to-face encounters is now ensured by virtual communication platforms; control of the surrounding environment is entrusted to electronic eyes; and world news is brought in by a TV set.

We are dealing here with a process of *innervation* of the physical and anthropic space by technology. Walter Benjamin devoted several pages to the concept of innervation. According to him, to innervate means to open a pathway into an individual or a collective body and, by becoming part of it, to reconfigure its organization, to enhance its performance, and to assign to

binary category of factual/fictional. Protective media, where the external threats are often the effect of the internal fears, further invite us to drop a binary approach.

it new tasks and goals.[6] Revolutions are the ultimate form of innervation of a society.[7] We can detect the same process when communication technologies infiltrate a space: they permeate its fabric, redesign its configuration, and increase its affordances. The effect is a radical change in the nature of the territory: what was a landscape becomes a *mediascape* – an area marked by and oriented toward the presence of media (Casetti 2018, 2023a).

In a mediascape, technologization affects multiple aspects of space. The first is the spatial configuration. Instead of an uncharted expanse to which technology must adapt itself, we increasingly deal with functional areas that are already structured to accommodate a technology. As Luciano Floridi (2019) summarizes, we move from environments to "envelopes." This is what happens with the enclosures created by protective media, with their perimeters marked by the presence of surveillance cameras, sensors, and dedicated doors, and their interiors aimed at hosting a technologically domesticated version of the world. These enclosures may recall the ancient caves in which our ancestors sought refuge – and upon whose walls they depicted the animals they feared.[8] However, the technological equipment that supports these enclosures dissociates them from these "primitive" shelters and projects them into a hyper-sophisticated and hyper-functional future.

Another aspect affected by the progressive technologization of space is the breadth of the milieu. Protective media tend to expand their range of action. If bunkers relied on a limited and solid space, surveillance cameras keep under control a relatively open and porous territory; if movie theaters offered well-defined shelters, the imaginary bubbles in which digital users find refuge while engaged in an online conversation can take place everywhere. Technology helps protective media enter even more deeply into our lives: thanks to technology, the presence of these media becomes impalpable, and their action ubiquitous. However, this trend toward extension risks a heavy

6   Benjamin borrows the term from Paul Valéry, who speaks of the innervation of the world by electricity (and compares it to the innervation of the world by Christianism during Tiberius's reign): see "Paul Valéry" (Benjamin 1996-2003, 2.2: 531-535). For Benjamin's idea of innervation, see *One-Way Street* (Benjamin 1996-2003, 1: n.p.); "Surrealism: The Last Snapshot of the European Intelligentsia" (Benjamin 1996-2003, 2: n.p.); and "The Work of Art in the Age of Its Technological Reproducibility: Second Version" (Benjamin 2008). For a wide exploration of Benjamin's concept of innervation, see Hansen 2012.

7   "Revolutions are the innervation of the collective – or, more precisely, efforts at innervation on the part of the new, historically unique collective, which has its organs in the new technology" (Benjamin 2008, 45, footnote 11).

8   The metaphor is wonderfully developed in a movie by Joe Dante, Matinee (1993). See Casetti 2023b, 41-44.

political toll: protection can easily become a suffocating over-protection, and the means of obtaining it can easily shift toward other ends, including social control.[9] Safety is increasingly granted at the expense of freedom. It is no coincidence, therefore, that the expansion of protective media is often coupled by forms of limitation. I am thinking of national firewalls and their geopolitical implications: a line of defense becomes an explicit block. And, moreover, I am thinking of economic, gender, and racial inequalities and their effects: the use of protective media becomes difficult for large strata of the population, redoubling a sense of exclusion.

Re-distributing the Sensible

Inside the enclosures where individuals find refuge, a peculiar operation takes place. The world from which these individuals have been severed becomes available again through images and sounds; a spatial deprivation is rewarded with a sensory excitation. The reconnection with reality takes different forms in different media. It may be the privilege of a few (as in the case of the security guards checking surveillance cameras) or of many (as in the case of a family watching the news). It may include functional data (the GPS) or a detailed picture of the world (the cinema). This connection can be offered without further barriers (traditional broadcasters) or it may require a monetary supplement (the premium content of cable channels). It may follow stable and pre-defined procedures (as happens in airports after checkpoints) or it may reflect contingency and chance (as often happens in communicative platforms and in social networks). Jacques Rancière (2004) coined the expression *distribution of the sensible* to designate how different media share their content, with modern media tending to create egalitarian access. Protective media too are dispositifs for a distribution of the sensible; simply, they re-distribute what they have taken away, and they re-distribute a sensible that wants to be a safe substitute.

The re-distribution of the sensible triggered by protective media is gratifying. When the replacement of the external world is provided by sensorial cues capable of making the presence of reality palpable again, the effect is to create a *mediated immediacy*. Individuals no longer exposed to their surroundings can grasp the world as if it were fully available; they feel tuned

9   An interesting case in which the GPS becomes a form of control – more precisely, the way of tracing the location of an individual in search of a safe shelter – is analyzed by Bernard Dionysius Geoghegan (2021).

with it, both spatially and temporally, despite being severed from it. The "reality effect" of cinema, or the temporal synchronization of live television, is a good example of this mediated immediacy. The world is once again at our fingertips, without being too dangerous.

The re-distribution of the sensible operated by protective media also has an ambiguous side. Indeed, when an enclosure and a screen merge, the images and sounds that are offered to individuals may appear as a compensation for the spatial deprivation that these individuals have suffered. These individuals have lost touch with their surroundings, and in exchange they can access the world from a safe and productive vantage point. Now, as the German philosopher Odo Marquard has pointed out in "Indicted and Unburdened Man in Eighteenth-Century Philosophy," the compensation can be seen either as a benevolent gift to an unlucky person, or as a dutiful response prompted by misfortune (Marquard 1989, 38-63; see also Marquard 1982, 15-37). In the second case, indemnity depends on a loss: there is not the former if there is not the latter. We need damages if we are to be compensated. This means that the spatial deprivation that individuals undergo is not just the first phase of the action of protective media; rather, it is its necessary premise. We need a severance if we want to (re)connect to the world. And we can (re)access it only if we accept to lose it. Seen from this perspective, the re-distribution of the sensible appears much more dramatic: while providing the pleasure of contact with reality, it constantly recalls the distance from the world that we inevitably experience when we use the media.

Finally, the re-distribution of the sensible has costs. They are not only the huge budgets required by intricate infrastructures like the technologies at the base of the GPS, or the environmental price paid for the extraction of resources tied to the production of energy, the social effects of often-underpaid labor, and the political efforts to fight the spread of fake news, brainwashing, and political polarization. What is at stake are also the ideological costs of a reconnection with a domesticated world. Indeed, faced with a docile universe, individuals acquire docility: intercepted by protective media, they accept their spatial deprivation, find their place within an enclosure, and follow well-defined behaviors. An existence closed in a bubble becomes the new normal. The re-distribution of the sensible, then, emerges as a powerful element of modern governmentality; it helps cleanse the world and its inhabitants, and makes both a functional presence. In its heyday, cinema was a good example of this governmental re-distribution of the sensible. Thanks to it, the tumult of events became a regulated succession of images and sounds, and the chaos of the spectators'

lives became ordered in a regulated and predictable behavior. What cinema did without apparently imposing its action, but rather as a form of escapism, the protective media today are doing in a relentless and uncompromising way. They too, and even more so, govern bodies and affects.

Reinstating Fears

Protection is undoubtedly a meritorious deed. It eases anxieties and lets individuals better cope with reality. Thanks to GPS, drivers can continue their journey; thanks to surveillance cameras, sensitive sites can continue to operate; thanks to television, families can tune into global events without disrupting their intimacy. Quite paradoxically, this sense of security allows fears to be restored: the images and sounds that reconnect individuals to the world can materialize frightening situations without being necessarily threatening. Because reality on the screen has become harmless, it can scare without actual consequences. It is what happens with many protective media, starting from cinema with its suspense, horror, and slasher films. In the movie theaters we can resume our anxieties – they will never be fatal.

Reactivating fears may even enhance the protective power of media. Images of frightening situations are like a vaccine: they expose onlookers to an attenuated version of the everyday dangers, and by doing so they stimulate the antibodies needed to face real menaces. Walter Benjamin traces the same parallel speaking of the violence in American slapstick comedies and Disney films: if, on the one hand, these movies are "a graphic indication of the dangers threatening mankind from the repressions implicit in civilization," on the other hand, they "trigger a therapeutic release of unconscious energies" that helps one to resist these dangers (Benjamin 2008, 38). From this point of view, protective media possess a proactive ability: they not only sterilize the world, but also immunize its inhabitants in advance (Moskatova 2020; Casetti 2023b).

However, reactivating fears reveals an inconvenient truth about how protective media work. The measures they deploy make the menaces they fight palpable. Monitoring the exterior, surveillance cameras suggest that surroundings are dangerous; looking for the best route, the GPS implies that roads are not easy to travel; reporting news from the world, television warns that mundane events are unpredictable. The entire "ecology of operations" of protective media – I borrow the term from Bernard Dionysius Geoghegan (2019) – is aimed at creating a defense against external perils that this same defense prefigures. In short: protection

summons the threats that it wants to keep at a distance; in so doing, it creates them and uses them as its own justification. The result is that we become victims of our own need for security. By sheltering ourselves, we anticipate the dangers; and by anticipating dangers, we further shelter ourselves. The denunciation of overprotection as a form of autoimmune disease that brings the social body to its own end is symptomatic of this perverse turn.[10]

The ability to fulfill a prophecy could be interpreted as a liminal action. It is in fact at the core of the operations carried out by protective media. The mechanism that underlies these media – a mechanism we can call the *projection/protection complex* (Casetti 2023b, Preface) – plays its game on slippery ground, where reality and prefiguration overlap. Indeed, this slippery ground is common to all the cultural techniques that shape reality in order to make it approachable (Siegert 2015; Geoghegan 2013). These techniques build a model of the world that allows us to mediate it, and then they invite us to take this model as if it were the world itself. Protective media – which work on behalf of the mediation with the world – are no exception. They create a separation between inside and outside from the desire for protection, they make this separation concrete, and then they project the threats that justify this protection onto the outside.

This slippery terrain is not a weakness. On the contrary, it gives protective media a special flair. On the one hand, it invites us to include our own fears in our confrontations with reality. The brave know that the world is frightening, and they are not afraid to be afraid. We must be brave and recognize not only the world's powers, but also the fact that these powers are often a projection of our own fears. Our anxieties then become a positive part of the game. On the other hand, this slippery ground reflects the fact that our current world poses a threat to our and its own existence because we have threatened it. In the age of the Anthropocene, the risk of extinction that comes from an increasingly unfamiliar environment is the product of our action on the same environment. We face a milieu that appears menacing to us, and whose fabric is interwoven with our presence. This milieu is substantiated by our actions, and gives us back what we did to it. Mediating it means to accept full responsibility for both parties.

The slippery terrain on which protective media operate brings into full view the convoluted logic of the contemporary mediation of reality.

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10   In the aftermath of the terrorist attack of 9/11, Jacques Derrida developed this denunciation in a dialogue with Giovanna Borradori (Derrida 2003). See also Esposito 2013.

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About the Author

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8. Carried Away: The Carrier Bag Theory of Media

Yijun Sun and Bernard Dionysius Geoghegan

Abstract

This chapter turns to speculative science-fiction writer Ursula Le Guin's short 1986 text "The Carrier Bag Theory of Fiction" for a theory of technics guided by the humble bag and its work of carrying. Using Le Guin's essay as a vessel for their own thought, Yijun Sun and Bernard Dionysius Geoghegan examine cases in the history of media for evidence of how theories of technology, technics, and techniques realize processes of getting carried away, bringing aloft, and jumbling together. A carrier bag theory of media offers a point of entry to undertheorized objects and processes in the history of media and technology, such as the vacuum tube and carrying techniques, as well as a promising bridge to thinkers such as Gilbert Simondon, Michel Serres, and Friedrich Kittler. More generally, it offers an alternative to many theories of media and technology that prioritize models of phallocentric hard sciences.

Keywords: carrier bag, media theory, vacuum tube, interface, system, transduction

The Carrier Bag Theory of Fiction

As technology becomes increasingly synonymous with data, streams, transmissions, signals, and noise, what role can the bag play in theories of media and technology? Or in theory, more generally? Everyone has a bag. Bags carry books to and from school and groceries home. Maybe they ferry a baby to daycare or separate the screws from the bolts in a box of furniture parts sent to us by IKEA, keeping small and large pieces deliberately sorted. By contrast, theory (from the Greek "θεωρία," *theoria*), as Martin Jay suggests,

is linked to attentively beholding something and delineating its dynamics (hence the links to a word like *theater*). It puts things on display, allowing the beholder to delineate mechanics, as in a *theorem* (Jay 1993, 23-24). Bags seem to do the opposite – gathering things up, mixing them together. If theory, theater, and theorems expose by exceptional and somewhat extraordinary means, bags seem to enclose, often by unremarkable means.

These seeming oppositions between theory and bag, between exposure and enclosure, between analyzing and transporting are, as speculative writer and daughter of the noted anthropologist Alfred Kroeber, Ursula Le Guin, suggests, symptoms of a larger philosophical anthropology that afflict fields as varied as fiction, science, and everyday gender politics. Le Guin's remarks display a razor-sharp insight into how everyday ideas of instruments, and the language that epitomizes those ideas, carry within them – even enforce – contingent values. Writing in "The Carrier Bag Theory of Fiction," a short piece that engages in the theoretical exploration of speculative feminism within science-fiction practice, she suggests that our thinking about technology carries within it a set of preferences for "hard sciences and high technology founded upon continuous economic growth" and that it perversely commits to the priority of hard-edged tools over more humble instruments of conveyance (Le Guin 1989, 170). In science fiction, this emphasis on hard technologies goes together with a preference for powerful male heroes, like the hand on an axe or the finger on a trigger. She writes: "We've heard it, we've all heard all about all the sticks and spears and swords, the things to bash and poke and hit with, the long, hard things [...]" (Le Guin 1989, 167).

Le Guin's remarks amount to an indictment of what might be called the phallic theory of technology, a bias for hard-edged weapons in human endeavor that relegates other stories, agencies, and technologies to the margins of the anthropological imagination. Le Guin seeks out a different approach to technē, one that lays emphasis on containers: "[W]e have not heard about the thing to put things in, the container for the thing contained" (1989, 167). She cites anthropologist Elizabeth Fisher as a possible point of entry to a non-phallic theory of media. "The first cultural device," Le Guin quotes Fisher as writing, "was probably a recipient [...]. Many theorizers feel that the earliest cultural inventions must have been a container to hold gathered products and some kind of sling or net carrier" (1989, 166). These remarks recall Lewis Mumford's arguments for the priority of techniques of storage in the rise of organized human settlements: "[T]he masculine weapons and tools of the hunter and miner – the spear, the bow, the hammer, the axe, the knife – were supplemented by typically neolithic forms, of feminine origin

[...]. The great fact about neolithic technic is that its main innovations were not in weapons and tools but containers" (Mumford 1961, 15).[1]

The carrier bag theory of fiction offers a more general point of entry to thinking what might be termed the "matrices" fabricating milieus, environments, collectives, and relations. "If you haven't got something to put it in," Le Guin writes, "food will escape you – even something as uncombative and unresourceful as an oat" (1989, 166). Sure, you might have some food ready to hand, you might even have put it into your primary container, the stomach, but what about tomorrow, next week, next month? This is where hands and stomachs need something more. Enter the carrier bag. "A leaf a gourd a shell a net a bag a sling a sack a bottle a pot a box a container. A holder. A recipient" (Le Guin 1989, 166). For Le Guin, this ordinary instrument provides a model for fiction – stories do not just expose and impose ideas, they also bring things together, hold them together, not merely words and narratives, but even readers and audiences.[2] And, as we argue in the present chapter, the carrier bag also delivers us to an alternate point of entry to theories of media and technology.

A Carrier Bag Theory of Media

For more than a century, theorists have identified media and technology with hard-edged extensions and impositions. At the heart of media theorists' preoccupations with axes and missiles lies an unmistakable philosophical anthropology. So numerous is this media anthropology of hard-edged implements that only the briefest inventory can be offered here. In the nineteenth century, German thinker Ernst Kapp (2018) sought to find the philosophy of technology around metaphors of phallic extension. Over time commentators, perhaps mistakenly, identified this view with Sigmund Freud's ambivalent

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1   Everyday phrases pathologizing carrying reinforce the bias for tools and instruments that "drive" force. The pejorative "free rider," the stigma with being a mere "passenger" (see the well-known song "The Passenger" by Iggy Pop or the Wilco song "Passenger Side"), warnings against being "taken for a ride" or getting "carried away" recapitulate the prejudice against carrying. To be carried, in these instances, is to abjure agency, to be the subject of another's will.

2   Indeed, in *Staying with the Trouble*, feminist scholar Donna Haraway expands upon Le Guin's account, using it as a seed bag for terraforming with earth others. As Haraway writes, "it matters what stories we tell to tell other stories with; it matters what concepts we think to think other concepts with" (2016, 118). It likewise resonates with the more recent discussions in the environmental humanities, which emphasize relational forces and the idea of becoming-with within the awareness of a larger milieu. See, for example, Anna Tsing's *The Mushroom at the End of the World* (2015) and Melody Jue's *Wild Blue Media* (2020).

suggestion that modern man had become a "prosthetic God" (1962, 31).[3] In subsequent decades, a book that announced media studies as a prospective field of academic study, Marshall McLuhan's *Understanding Media: The Extensions of Man* (1964), put "extension" as well as "man" at the center of media analysis. Variants on this emphasis have traversed writers in a variety of contexts and traditions, such as French philosopher of technology Bernard Stiegler's (1998) identification of human powers' social organization with the axe, and German media theorist Friedrich Kittler's (1990, 1999, 2013, etc.) fascination with processes of inscription and weapons like the V2, along with what Geoffrey Winthrop-Young refers to as Kittler's "discourse machismo" (2011, 128). (A variant on these themes, widespread in post-structuralist traditions, incorporated attention to gaps, recesses, puncta, suture, and castration into the analysis, less as an alternative to phallic theory than as its dialectical expansion to include processes of invagination as counterparts to phallic media.)[4]

With these observations in mind, perhaps it is important to say that our purpose is not to propose a radically new theory of media and technology, a carrier bag theory of media, with which we might challenge rivals' theoretical armature. Such a theoretical venture, even if it were to privilege anti-phallic media, could perhaps not help but be phallic theory by another name.[5] Besides, recent years have already witnessed a renaissance in thinking about enclosure as an instrument of technics, which our own modest chapter at best carries a step further. In his book *The Marvelous Clouds*, John Durham Peters announces a plan to argue that media "are vessels and environments, containers of possibility that anchor our existence and make what we are doing possible" (2015, 2). Peters followed the brilliant work of Zoë Sofia (2000)

3   Ambivalent because, just a few sentences later, Freud has turned the metaphor of prosthesis back toward the problem of enclosure and conveyance. "[R]ivers which threaten to flood the land are regulated in their flow, and their water is directed through canals to places where there is a shortage of it [...] The means of communication are ample, rapid and reliable" (Freud 1962, 31).

4   See Jacques Derrida's "The Law of Genre" (1980).

5   As literary critic Samuel Weber has noted intermittently throughout a number of books, the "container" itself is hardly an end-run around masculinist dreams of mastery. At least since Aristotle, ideas of body and place as "containers" have functioned not simply to serve transport, but also to close off or subdue the uncanniness of a human self perpetually tending to slip well-defined moorings. Weber's remarks, elaborated, would tend to call into question the simple opposition between "container" and "phallic media" or "hard-edged technologies," examining the possibility that both participate in a single paradigm of identity and agency, which, we suspect, Le Guin's theory of carrying questions. See, for example, Weber's remarks in *Theatricality as Medium* (2004, especially x, 5, 7, 9-13, 47, and throughout).

and her comments on containers and vessels as a problem for media theory. In the same vein, Alexander Klose (2015) gives the "shipping container" a new place in the histories of media, technology, and infrastructure.[6] Yet, the container is not quite the same as a bag or carrier. Sure enough, many bags act as containers, which can often involve carrying. However, to be a carrier is quite often to defy containment – the carrier transports things from one place to another, undoing the situatedness of things. The carrier of a parasite, a gene, or a cross, likewise, seems to undo containment in favor of unsettling collectivities.

Like some of these examples of carriers and carrying, the bag (and the sling) does not presume closure, certainly not in a manner that ensures stable or secure containment. They are often open-ended. They are not a technology of mastering or holding in, but rather gathering up, as in an act of service. Some of Le Guin's examples include the gatherer carrying food in the settlement. Her bags carry a different sort of technicity than the hero carrying a sword. Her bags tend to collectivize, draw together a community, rather than merely contain and isolate some given thing. Transposed to the analysis of media and technology, it mobilizes attention toward displacements, alliances, and compositions.

Is the carrier, then, a metonym or metaphor for the female body? Are all carrying bags modeled on woman-as-child-bearer? Le Guin's primary example, a bag for primitive humans to gather food, seemingly prioritizes a historical fact of women-gatherers but in no way limits itself to the affordances of a womb. The carrying at stake here is – as Mumford also notes – traditionally feminized but not bound to bearing children. As philosopher Luce Irigaray argues in *An Ethics of Sexual Difference*, "Woman, insofar as she is a container, is never a closed one. Place is never closed. The boundaries touch against one another while still remaining open" (1993, 51). That openness includes an openness to carrying other than biological reproduction. If carrying finds a special model in the female body, it is nonetheless not reducible to that body. We can think here of the links of carrying to transport, and the possible non-participation in binary conceptions of gender. "Trans-" conjures thoughts of moving between binary poles without quite collapsing into one or the other. Indeed, media theorist McKenzie Wark

6   Also notable is a much larger body of what might be called "messenger theory" by writers such as Sybille Krämer (2015) and Michel Serres (1995). These are studies of communications with an attention to the myriad couriers responsible for carrying (and in some way transforming) – angels, delegates, and emissaries, not to mention apparatuses like sea vessels and air-pumps. All speak to the role of "drawing things together" as part of making things what they are.

(2020) seems to suggest that to be trans- may be a sort of carrying along, a leaving of one gender identification without necessarily landing in a definite and final way at another.[7] As such, the carrier bag theory is neither heteronormative nor bound to biological paradigms of sexual difference or sexual reproduction. As such, even if a carrier bag theory tends to contest the masculinist and phallic ideology of much media and technology, it does not succumb to a merely reactionary "against phallic media theory" that embraces some originary matrix of the female body in sexual reproduction.

What then, finally, is a carrier theory of media and technology? Or a carrier medium or technology, for that matter? A carrier bag theory of media technics is not so much about one or another class of technologies as it is about operations and affordances that encompass diverse instances. In other words, there are more or less defined categories of technologies that are "broadcast media" or "axes" but there is no discrete field of "carrier technologies." Rather, the carrier bag theory of technics invites us to attend to media technology differently and, in so doing, develop fragments of an alternative analytics of technics. Cables, disks, sewer systems, electrical wires, and airplanes can all be understood as carrier technologies. Boxes and envelopes, clearly, are carriers, and could easily be grasped together with other instruments as a sort of technology. Many, though not all, standardized forms of modern infrastructure are carrier technologies. If it sends a signal, relays a good, gathers up and delivers, it's a carrier technology. An axe is not obviously a carrier technology (indeed, it seems to be the very sort of technology Le Guin seeks to de-emphasize). And yet, the technology of the axe depends, more often than not, on being "carried," and, as such, emphasizes the diverse place of "carrying techniques" within technics. Indeed, a carrier theory of technology may even open up onto other classes of media theory that emphasize the work of technology in gathering up and delivering. Cornelia Vismann's work on files (2008), or even on the work of city walls in producing a people (2013), hints at a broader family of media-technical operations related to the work of gathering up and carrying that would help specify the fuller scope of carrier bag theories.

How, then, does the carrier bag theory of media cause us to gather up a different story, be it for media, theory, or technology? It does so in at least two different ways. First, the carrier bag theory of media invites us to prioritize different sorts of objects in the history of technology outside the phallic

7   Wark writes in *Reverse Cowgirl*: "Hello world, I'm trans! Am I binary or non-binary? Am I trans-femme or a trans woman? No idea. Well, some ideas, some steep inclinations. But the decision that's made is to jump off the edge of masculinity and hope to float" (2020, 187).

instruments valorized by Kapp and McLuhan. Second, whatever objects or systems we consider, the carrier bag theory of media asks us to focus on different functions. Against hard-edged swords or even hermetically sealed containers, we are instead invited to think about forms of carrying and transporting in the fashioning of collectives. Indeed, it may turn out that even phallic instruments can be carriers in the service of collectives. (The phallus presupposes a certain sort of carrying, too.)

Vacuum Tubes as Carrier Media

A carrier bag theory of media finds in the vacuum an intriguing example of carrier technics. What is a vacuum tube? In the first instance, it is a relay for modulating the flow of electricity. In the twentieth century, the tube was widely deployed in telecommunication systems: it enabled the control of an electric circuit, including the detection, reception, rectification, and amplification of electronic signals. An almost mind-numbing array of modern media technologies – radio, telephony, radar, television, computer screens, computer hard drives, railway switching technologies – came into being, in no small part, through the ingenious deployment of vacuum tubes. Before the widespread adoption of solid-state transistors following their invention in 1947, vacuum tubes were the primary and reliable control units in electronic systems.

The prominence of the vacuum tube in telecommunications springs, in part, from the growing demands for "carrying" that organized modern technical infrastructures. "Carrying" was a function implied in most modern infrastructures, from urban sewage to railway systems, in which standardized forms of conveyance laid the foundation for large-scale, industrially serviced settlements. Telegraphs, electrical networks, and computers may contain a signal or data, but often it is only transitory, as part of its conveyance or transformation from one site to another. For example, the Fleming valve, the hot-cathode vacuum tube that emerged in 1904, is a diode that rectifies electricity. It functions as an electric valve because the electrons passing through the tube can only flow in one direction: from the cathode to the anode. In the triode named the Audion, invented in 1906, electricity passes through an extra grid that amplifies and modifies the electromagnetic waves, making it a versatile component for various applications, including early radio and telegraphy. Depending on its configuration, a vacuum tube can also transmit electric signals over long distances. It seemed destined, for a time, to be the "obligatory passage

point" of twentieth-century electrical and communications infrastructures (Callon 1986; Latour 1987).

The power of the vacuum tube rests on an ingenious transformation of glass into a receptacle for information processing. As the name suggests, an airtight glass envelope constitutes a vacuum tube that encompasses some basic elements, such as a cathode and an anode. Depending on the number and configuration of elements in the tube, the vacuum tube can take on various forms, such as a diode, triode, tetrode, and pentode. The glass enveloping technology was the key to the development of the vacuum tube, for it provided an individuated unit for the control of electromagnetic waves and an interface to communicate with the outside environment. The Fleming valve (diode), for example, was developed from the blackening phenomenon observed on the glass wall of Edison's incandescent light bulb. The envelope of the light bulb provided a near-vacuum environment and a displaying interface that made the mechanism of thermionic emission visible to the human eye. The cold-cathode tube, following a slightly different path, emerged in Europe as a laboratory instrument for facilitating the observation of gas spectra. Prior to its emergence, the use of glass vessels in electrical experiments loosely followed a trajectory from the Leyden Jar, which conducted electric shocks through the hands of Ewald Georg von Kleist and Pieter van Musschenbroek in the 1740s, to the "Electric Egg" designed by the French experimental physicist Jean-Antoine Nollet, which demonstrated luminescent glows in a sealed bulb during the same decade. In the spring of 1857, Johann Heinrich Wilhelm Geissler, a professionally trained German glassblower, created a sealed gas-filled tube with two platinum electrodes known as the Geissler tube, which contributed to subsequent refinement of devices like the Crookes tube. The most prominent display device of the twentieth century, the cathode-ray tube, evolved from the Crookes tube and Braun tube and found applications in rasterized imaging scanning for television and computers, as well as vectorized imaging for oscilloscopes, radar systems, and some early electronic games.

In the case of the vacuum tube, the glass envelope creates an atmospheric environment that isolates the electrodes in an artificial space; its enclosed space makes the control of electrons possible. The tube's envelope offers the ground for possibilities, and each form of the tube is an actualization of these potentials. The envelope is an insulator, enclosure, and protector, as well as an interface, relay, and communicator. From a static point of view, the vacuum tube is enabled by the technology of containerization. From a dynamic view, the vacuum tube is part of a larger system with which it exchanges information through techniques of "carrying" signals. The vacuum

tube is, in this sense, a carrying path, as well as a transitory container, of electricity. If we say that the electrical wave is the carrier of information that propagates in space, the vacuum tube makes this possible because it generates electrical waves in various ways and modulates them by changing their amplitude and frequency. Electricity and information exist in the differentiation between individual entities; in other words, they exist in the flows of exchanges. Instead of trapping electricity inside and sealing it off, the vacuum tube gained its property through transmitting, transporting, and trans-formatting where the flow of energy and information happens.

Carrier Interfaces

The glass vessel of the vacuum tube functioned as an early interface that indicated a delicate play among system and environment, individual elements, and collective apparatus that would shape carrying technics. For example, vacuum tubes carrying signals needed, in turn, something in which to shelter. In a memorandum to Edward J. Nally, the vice president and general manager in the Marconi Wireless Telegraph Company of America in 1915, David Sarnoff, described a visionary scheme of the "Radio Music Box." In this scheme, Sarnoff outlined his plan to turn the radio into a "household utility" like the piano or phonograph by containing it in a box: "The 'Radio Music Box' can be supplied with amplifying tubes and loudspeaking telephony, all of which can be neatly mounted in one box" (Sarnoff 1968, 31). By the 1910s, the problem of transmitting music was already solved in principle. Wireless technology eliminated the need for wires connected to the enormous network system. It created the possibility to achieve the radio receiver in the format of a single cell to receive music signals. The "Radio Music Box" Sarnoff configured was possible for different wavelengths. Vacuum tubes, circuits, panels, and all complicated elements were put into a compact box, with the appearance of a wholesome commercial product.

From the perspective of a carrier bag theory, we are gradually coming to a new perspective on the history of electronic media. Carriers and containers often "nest" within one another, suggesting variable and irregular distinctions between system, interface, environment, and carrier (Mitchell 2005, 208, 216). A conception of "carrying technics" tends to ricochet across the technical system, rather than vesting in this or that specific class of objects. In this manner, the question of the "carrier" helps draw attention to an entire network of problems by which elements and systems configure to allow or exclude relations to a larger milieu or environment. As Stiegler

puts it, a technical object "becomes concretized by closely conforming to this milieu, but in the same move radically transforms the milieu" (1998, 80). In traversing bodies, carrying regulates aspects of these interrelations. Individuals are created by shifting boundaries that must morph, exchange, and relay in relation to a collective; and yet, the individual, as individuated, must "carry" some technical trace of the collective from which it is offset. Like the term "agent" (which can mean an autonomous self-motivating entity or the mere instrument for such an agent), a "carrier" is sometimes an apparently active intervener, other times more like a condensation or plant relaying forces from afar.

Norbert Wiener stands out as an early scientist reflecting on the rapports among carrying, containing, revealing, and obscuring in early electronic media systems. He famously uses the concept of the black box to describe a unit performing a function without one knowing how it functions. "I shall understand by a black box," he writes, "a piece of apparatus, such as four-terminal networks with two input and two output terminals, which performs a definite operation on the present and past of the input potential, but for which we do not necessarily have any information of the structure by which this operation is performed" (Wiener [1948] 1961, xi, note 1). This turned attention to the manner in which a technical system not only "carries" this or that signal; it also, as by a vacuum tube, transforms, transduces, that signal, in manners not easily observed from the outside. Not merely a concept for engineering, but a new approach to carrying is implied in Wiener's specification. Elizabeth Petrick argues that "This concept is simultaneously a mathematical theory, a device, and a metaphor" (2020, 577). With the black box, we not only have a theory of carrying within engineering. We also have a manner in which engineering transforms what it means to carry, and a new way of grasping complex systems. In "Of Digital Computers Called Brains," Warren McCulloch and John Pfeiffer write of a machine "so complicated that no one knows its entire blueprint, and certainly no one knows whether it is wired according to that blueprint" (1949, 374). Signals, brought inside a machine, become jumbled up, processed, obfuscated, *carried away*.

Transduction and Carrying

To outline these operations, we will now go a little further with media philosopher Gilbert Simondon. His relevance to the study at hand is manifold. For one thing, he is an analyst of vacuum tubes. But beyond that, the carrier bag theory of media, when brought into contact with Simondon's

philosophy of technology, unearths elements of an already worked out theory of carrier technics, less indebted to phallic preoccupations with extension and inscription that dominate so much of twentieth-century theories of media and technology. For Simondon, carrying stands out as a, perhaps the, decisive factor in modern technics. As he writes in *On the Mode of Existence of Technical Objects* of 1958, "The reason the living being can invent is because it is an individual being that carries its associated milieu with it; this capacity for conditioning itself lies at the root of the capacity to produce objects that condition themselves" (Simondon 2017, 60). He continues, "a deeper analysis of the inventive process would no doubt show that what is determinant and lays an energetic role are not forms but that which carries the forms, which is to say their ground" (Simondon 2017, 60). As we see, Simondon invests the problem of "carrying" with decisive and distinctive stakes, not reducible to merely "containing" or "containers." When he says that the body is a carrier of tools, he doesn't mean it contains. It means something more like "bears," like the bag that carries a baby, or the shoulders that bear a cross. "Carrying" defines a basic aspect of Simondon's media and philosophical anthropology. The vacuum tube is, then, not one case among others in his work. On the contrary, in its carrying functions, it is a conceptual lynchpin for grasping Simondon's entire theoretical project.

Put simply, for Simondon, technologies based on signals and waves are organized around the problem of carrying, and this dynamic has a privileged role in the interpretation of modern technical systems and even post-cybernetic ontologizing. The electric current and electromagnetic wave's ability "to be modulated makes them faithful carriers of information, and their speed of transmission makes them rapid carriers. What then becomes important is no longer the power conveyed, but the accuracy and fidelity of the modulation transmitted by the information channel" (Simondon 2017, 144). A body or system that "carries" a charge of electricity does not "contain" it, except in a provisional manner. More than that, it displaces that charge. For example, if I "carry" a charge of static electricity, I am liable to relay it at any moment to the next person I touch, who will get a shock. To carry, in this case, threatens containing. This is the reality of modern technical systems – albeit in a highly controlled manner, they are ready to transfer established contact, and affirm systemic relations, while marking out a set of controlled transformations. And, with the rise of cybernetic or "open" machines that incorporate humans into their operations, this potential to carry a signal also concerns the fate of human individuation in a peculiar manner (Simondon 2017, xvi).

Attention to Simondon's emphasis on "carrying" elucidates the specific character of his claims around transduction. Often, Simondon's interest in transduction has been seen as a sort of ontological approach to the question of genesis – how individual, collective, and psychic entities come into being through transductive relations. Fair enough, and that crucial point takes on richer significance when considered in terms of the carrier bag theory of media. Instead of seeing his studies of "transduction" as how one thing becomes another, or how one or another individual or system comes into being, we can understand it as a way to examine how technical systems foster new collective arrangements through the transductive work of carrying from one place to another, their containers, receptacles, and vessels acting as *ground*, as much as *figure*, to the ontological picture. Carrying, as already suggested, is *trans-*, in the sense of displacing from there to there, traversing without conquering or reducing two poles. Transduction, a term Simondon seems to borrow from electrical engineering, is about a controlled method of *trans*porting and *trans*forming matter and signals. It is about displacement. It is about moving between spaces and modulating signals carried by a network. In Simondon's portrait, the "forces" of carrier and carried intermingle. Hence, Simondon's emphasis is on elements in an ensemble "carrying" the technicity of the whole. This, in fact, is what transduction is really about – and why, for that matter, vacuum tubes seemed to excite Simondon's theoretical interest. They do not simply transform a signal. They are, at a very basic level, a place where a signal is held – not merely for a further relay across a system, but also a way of holding the entire system together, of allowing its many parts not merely to coexist but to gather together and, at the same time, be different. Viewed from the carrier theory of media, not merely the contributions of Simondon, the very question of how a technical system is organized and related in itself, or what we look for from an empirical study of technology, changes.

Milieu and System

In *On the Mode of Existence of Technical Objects*, Simondon highlights how the humble vacuum tube can become the lynchpin to a new metaphysics of modern technology. For Simondon, the concrete mode of the technical being comes about when it becomes, in a certain sense, individuated and self-contained. When many diverse and varied parts cease to work as so many one-off individuals, they instead integrate into a technical system. In a sense, technology comes into itself by becoming communicative, according

to Simondon. But for this becoming, it needs to be entirely coherent within itself and entirely unified (Simondon 2017, 29). He characterizes this as "the play of limits whose overcoming constitutes progress," rooted in overcoming "incompatibilities that arise from the progressive" integration of "sub-ensembles" until, at last, they develop a more perfect and synthetic network of reciprocal, yet differentiated, relations (Simondon 2017, 32). This means that, in a collection of parts, every part needs to be able to adapt dynamically to every other – concretizing, at one and the same time, more distinct functions, which are nonetheless integrated into a set of reciprocal relations.

For Simondon, the vacuum tube, in its work as a transducer of signals, seems to suggest something about the collective formation and transformation of humans. For, in his account of technicity, the first thing transduced is the human itself. For him, part of the work of technicity is a collective relation that binds together technical elements and the total system by making each individual part a special sort of "carrier" for and of the collective. Technicity, he writes, "turns man into a bearer of tools, according to a concrete apprenticeship" (Simondon 2017, xvi). The same technicity that orients individual technical elements to gather together in a collective relationship, carrying a certain sort of relation and difference simultaneously, also, when brought into connection with humans, trains them to become carriers. In this account, humans make machines, bringing them into being, but machines – as carriers of new relations deemed technical – remake the human as something equipped with new powers of carrying. This relates to Simondon's broader emphasis on technicity as, at its essence, a problem of establishing and maintaining milieus. Modern technology is not one or other tool that sits in our environment, but rather elements in systems and relays that together assemble dynamic relations across parts. The question for such an understanding of technology can never be what is this or that given element, what is this or that technology, who invented one or other part. Rather, a major and decisive question becomes something like: By what means of carrying can this technicity realize itself as a larger ensemble? The vacuum tube, it turns out, is a privileged case of carrying for Simondon, one by which varied forms of gathering and transport essential to a technological system are displayed.

Viewed in terms of carrier media, the concrete instance of the vacuum tube casts light on a larger aspect of Simondon's philosophical anthropology. A vacuum tube formed in the dynamics of the play of the interior and exterior milieus. The glass envelope drew a surface that made the system of functioning elements in a self-sustained system that became independent from the milieu. What's more, it became an interface through which the human *qua*

living matter entered into relation with the milieu (Stiegler 1998, 49). Different from the lightbulb and the laboratory instrument for demonstration, the vacuum tube transformed into an information carrier because of the transductive operation between objects and humans, and it continued to function because of this transduction. This logic of carrying is suggested by the philosopher Michel Serres, who has his own way of thinking about what it means to be carried from place to place. For Serres, a constructed system is partly an order of signals that are relayed, interrupted, suspended, and confounded – all operations tied up in carrying. The periodic, oscillating electronic signals are carried by electronic waves across space. The vacuum tube turned into a signal carrier through transductive operations between entities, and it acquired its function as a result. This logic of transduction is discussed by Serres in terms of relationships, systems, and transformation. For Serres (1982), a constructed system is partly an order of signals that are relayed, interrupted, suspended, and confounded – all operations tied up in parasitism. Playing on the tripartite connotations of biological parasite, social parasite, and static in the single French word *parasite,* Serres suggests that a third element (the parasite) induces oscillation within a system. The introduction of a new relationship disrupts the balance and ultimately transforms the system into a new dynamic. What is often overlooked is the allusion to the example of the diode and triode he uses to illustrate his well-known figure of the "third," the interloper whose intervention (or exclusion) generates a system (Serres 1982, 51-55). The introduction of a third element in the two-element diode allowed periodic fluctuations between the cathode and the anode, which turned the triode tube into a new system with the function of amplification, oscillation, and signal processing.

Carrying – as exemplified by the vacuum tube and imagined by Le Guin – offers a different perspective to think about media functions in classical media theories. Rather than engaging in a full-scale summary of classical media theory's variants and possibilities, we select one exemplary instance. In homage to the work of thinkers like Wiener ([1948] 1961) and Claude Shannon (1948), Kittler (1993, 8) famously argues that media are defined by a tripartite operation of store/transmit/process. In light of the carrier bag theory of media, we can now make a clarification on these sorts of claims. For all its triadic elegance, the schema of storing, transmitting, and processing is underwritten by a single and common operation, albeit one that does not cease to differentiate itself: carrying. To store data is, in a sense, to carry it, be it on a hard disk or even in a celluloid frame. To transmit a signal is to mobilize such a carrying, to allow it to travel from one body to the next, which it brings into transductive relationships. This transmission entails

another form of carrying, namely, processing, in which the qualities of a signal are morphed, mutated, and adapted by the bodies it traverses.[8] To define media operations, as Kittler proposes, may then be simply to theorize the diversities of "carrying" involved in a technical system. It may be that all media presuppose a carrier bag theory of media. Although our analysis has only briefly touched upon the examination of electronic technical systems, the potential discussion regarding a carrier bag theory extends far beyond this example. A bag transforms the relationships between entities, whether it's hardware and wetware, humans and nonhumans, nature and culture, or the dead and the living. In its tendency toward transgression and transformation, new connections emerge and dissolve, giving rise to temporary orders of ensembles in constant states of becoming.

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8   In Kittler's analysis of discourse networks, the roles played by women are always marginalized in the circuit of literature production. We developed a different theory of signal processing from the perspective of carrying and transforming, where all actors are equally encompassed in the technical operation of the bag. In this theory, as Le Guin (1989, 170) writes, there is enough room to keep everyone in their place where they belong in the scheme of things.

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9.   Beyond Access: Transforming Ableist Techno-Worlds

Neta Alexander and Jonathan Sterne

Abstract

Media and disability scholars Neta Alexander and Jonathan Sterne reflect on how they have come to study technology through a disability-informed lens. Grounding this conversation in their own intellectual journeys, they challenge ableist perceptions such as the focus on visual or eye-hand interactions, the decorporealization of the user, and the dismissal of mediation as less authentic or real than in-person encounters. Together, they call on media scholars to explore disability hacktivism, imagine crip futures, and develop what Arseli Dokumaci calls "activist affordances."

Keywords: disability studies, ableism, dismediation, crip studies, interface, crip technoscience

How We Got into This

Alexander:

My understanding of technology and the ways it structures our lives has been shaped by my interdisciplinary academic training and my embodied experience as a nonaverage user of digital interfaces and personal electronics. Since the rise of personal computers in the 1970s and 1980s, the average user of computational technology has been imagined and studied as male, white, able-bodied, and a native speaker of English (Costanza-Chock 2020; Mulvin 2021). This fictional, "techno-chauvinist" idea mirrors the lack of diversity among web designers and software developers working across the tech industry (Broussard 2018). As a bilingual, immigrant woman with invisible disabilities, I often occupy the position of a technological misfit. To this day, it is easier for me to watch films and shows with closed-captioning, while

my thick accent prevents me from using most speech-to-text and automated transcription tools (Rangan 2023). Due to my congenital facial difference, many biometric "security features" fail to recognize my asymmetrical smile as composing a "human face," preventing me from automatically unlocking my smartphone or using a border control machine based on face recognition algorithms (Magnet 2015).

These experiences sparked a fascination with moments of techno-failure such as buffering, disconnection, and what I previously called "digital dams," that is, disruptions and noises resulting from technological, legal, industrial, economic, or political structures and limitations (Alexander 2017). These moments of friction call attention to the inherent, yet oft-denied precarity of the infrastructural, legal, cultural, and technopolitical mammoth known as "the internet." My interest in techno-failure gained a new sense of urgency in my early thirties, when I had a complete heart failure and became dependent on a WiFi-connected pacemaker for my survival. As a "disabled cyborg," to borrow a term from design researcher Laura Forlano, I started to theorize both disconnection and hyperconnectivity as questions of life and death. My pacemaker saved my life, yet it also exposes me to constant data surveillance and potential security threats (Alexander 2018).

My current work draws on film and media studies, science and technology studies, and critical disability studies to develop a new theory of the digital interface. The ability to bring my embodied experience into my scholarly work is a recent development that I owe to disability scholars and activists invested in autoethnography as a methodology for the study of how bodies meet the world (Clare 2017; Piepzna-Samarasinha 2018; Sterne 2021). Although trained in comparative literature and film studies, I shifted my scholarly focus from narratological, representational, and aesthetic inquiries to emerging fields such as interface design, algorithmic studies, and "critical access studies" (Hamraie 2017). This interdisciplinary approach centers the nonaverage user and the entanglements between bodies and digital technologies.

Sterne:

I came to technology studies because I was looking for a way to write a history of sound and modernity. An undergrad major full of writings on visuality and modernity led me to ask the question: what happened to sound in the same era? When I started my graduate training in 1993, theory was the hot topic, not technology. One needed a good hot take on Habermas or Foucault or Spivak; a take on technology was strictly optional. Some graduate students and my undergrad teachers had made me aware of Theodor Adorno's

(2002) essays on the phonograph and medium-theoretical approaches to sound (Durant 1984; Mowitt 1987), but it was only later that I came to realize that technology would be a good way into the question for me. Given that I couldn't very well write about *how stuff sounded*, I was looking for paper trails, and sound technologies provided an excellent and fascinating trove of documents, with an especially attractive concentration in Washington, DC at the Smithsonian and the Library of Congress. Of course, other writers have taken other approaches. Emily Thompson (2002) wrote about acoustic materials rather than sound-reproduction technologies; Daphne Brooks (2021) wrote about, well, writing about sound; and Paul Gilroy (1991, 1994) was an early inspiration: his first two books each have a chapter on music and modernity, so I knew it could be done.

I can't say that technology was a *necessary* choice for me, it was just what made sense to me at the time. The 1990s was a time of extreme techno-utopianism in American popular culture and commentary. In the corner of communication studies in which I was trained, the so-called Toronto School was very influential, which as Neta points out above is both ableist and techno-determinist in its approach to sound and technology. McLuhan and Ong's concept of orality was also white and Christian supremacist (Sterne 2011; Nolan 2018). So a lot of the original motivation for *The Audible Past* was an effort to rewrite the history of sound against that tradition (Sterne 2003a).

So how to talk about technology? My early formation might be summed up in the equation Michel Foucault + Pierre Bourdieu + Stuart Hall: Foucault's operational theory of power; Bourdieu's understanding of embodied practice and repetition; and Stuart Hall's theory of articulation and the detour through theory. Foucault and Bourdieu both understood that technologies always involve techniques, but they understood it differently. Foucault (1991) treated techniques as impersonal operations; Bourdieu (1990) treated them as embodied knowledge. Later, I would learn that their work was really a distillation of ideas from French anthropology, sociology, and history of science (Mauss 1979; Elias 2000; Sterne 2003b).

Hall's theory of articulation provided a way to *actually do* anti-essentialism, to describe it in action. Articulation offered a way to describe technology as made up of non-necessary elements without reducing it to "just" a social construct (Hall 1986; Slack 1996). Today scholars are more likely to go to science and technology studies for that sort of thing, and indeed I've found that field quite welcoming; but for me cultural studies – especially as taught to me by my undergraduate and graduate mentors – shaped how I think about technology. One difference between the fields is in their general orientations to theory. In cultural studies, as I learned it from Hall's writings

and my graduate advisor Larry Grossberg, theory is a detour one takes on the way to redescribing the world (Hall 2003, 2016; Grossberg 1997). The goal is a better account of the conjuncture than what you came in with.

Disability came into my work through a different route. I had some disability in my family, and both my parents had careers in the social work world, which meant I dabbled in "the helping professions" and was aware of disability as a thing in the world while an undergrad as well, even though I didn't identify as disabled at the time (though there is a certain solidarity between fat people and the physically disabled since the world isn't built to fit us). This meant that when I started reading sound theory in earnest in grad school, I was frankly shocked by the things writers were saying about Deafness and Deaf people – completely ignorant and prejudiced talk that would never be allowed if the subject was race or gender. While there's a tendency today to think that attention to race is new on the scene (and it is true that millennials and Gen Z are much less likely to put up with the kinds of bullshit my generation and our teachers before us often tolerated and perpetrated), 1990s cultural studies was full of feminist, Black (though it wasn't capitalized at the time) and postcolonial work (in addition to Hall and Gilroy, other writers who shaped my thinking at the time included Said 1978; Spivak 1988; Haraway 1991; Stabile 1994). We already knew better than to write from a universalist white or male perspective. I'm not saying everyone did that or did it well, just that someone educated in the tradition knew it was a going issue. So to see Deafness described as a personal failing in the literature just shocked me into recognizing how important and constitutive it was for hearing culture. That was only confirmed when I began researching in Alexander Graham Bell's (1883) papers, where the desire to eradicate a "deaf variety of the human race" sat alongside the desire to reproduce sound. It was all right there. The existing Deaf and disability studies literature – which was just getting going in the US in the 1990s – helped me understand how to narrate what I saw in the archives (Davis 1995; Baynton 1996; Clare 1999). I might also say that disability studies prepared me to become disabled when cancer ate my right recurrent laryngeal nerve and TKIs later attacked my body, but that is another story (Sterne 2021).

Alexander and Sterne:

The Persistence of Ableism in Media Theory

In 2017, Jonathan published an essay with Mara Mills called "Dismediation," which argued that we needed to move beyond media and technology theories

that use disability as nothing more than a "representational crutch" and instead move toward documenting the centrality of disability to media and the centrality of media to disability (Mills and Sterne 2017, 370). Since then, there has been a boom in disability media studies. But just as ableism persists in our culture and has been amplified by climate crisis, pandemics, and mass migration, so too it persists in media studies, and the suggestions that essay offered still stand. This is especially apparent when we examine how our field treats mediation. There is still often a political preference for "less mediation": communication with and through intermediaries is less authentic than communication between people without intermediaries. Presented as claims this stark, most hermeneutically trained scholars will reject those propositions as absurd (what about language, accents, context, culture?). But we still hear them all the time in analyses of online platforms. Now, consider these questions from the standpoint of neurodiversity, blindness, and Deafness: in the context of disability there are species of mediation, differently suited to different bodyminds and situations.

This approach also gets us out of simplistic "more or less accessible" frameworks that disability scholars warn against (though we can always do with more access). For instance, the work on audio description shows this amply. Authors repeatedly make demands for aestheticized, interpretive, mediated, positioned audio descriptions over descriptions that attempt to be objective; the same goes for closed-captioning, subtitling, and protactile interpretation (Downey 2008; Zdenek 2015; Kleege 2018; Clark 2021). The work on neurodiversity and communication has also challenged the "less mediation" myth (Alper 2017; Yergeau 2018; Rauchberg 2023). Beginning from actual disabled practices of communication helps us to understand that communication is mediated all the way down, that our choice as humans is among species of mediation (not more or less mediation), and that, ultimately, communication begins from interdependency. Media theory can and should begin from interdependency. If we acted on this insight, that could be a stake in the vampire heart of methodological individualism.

The assumption of an individual, able-bodied user of technology forms the basis for most contemporary media theory. This leads us to consider another prevalent ableist idea: the fantasy of decorporealization that has powerfully shaped the cultural imaginary surrounding the internet. From the 1990s paeans to the information superhighway as "the great equalizer for the handicapped and home bound" to the growing popularity of transhumanism, tech companies (and the sci-fi novelists who inspire them) have toyed with the fantasy of bodyless existence for decades (Ellcessor 2016). These fantasies of disembodiment, which were popularized by blockbusters like Avatar

(2009) and (failed) techno-utopias like Mark Zuckerberg's Metaverse, are important to attend to because they illuminate why both users and science and technology scholars tend to treat disabilities as an afterthought. The ideal internet user, as Elizabeth Ellcessor contends, "perpetuates the individualism and romanticism of digital media cultures as well as a neoliberal emphasis on the self as constructed through constrained consumer choices" (2016, 74). This user is subjected to "able-bodied norms" in terms of "technological design, use and meaning" (2016, 74). Ableist design standards assume an ideal or preferred user, such as an average-sized man who navigates the internet while sitting in a chair and using a mouse and keyboard. A user, however, might be a low-vision, bedridden woman navigating the web via a screen reader and speech-to-text software while trying to distract herself from chronic pain. Imagining such a user draws attention to the fragility and unknowability of the human body in ways that undermine much of the post-human logic of our current techno-worlds.

The denial of biological limitations is especially harmful when it is used to design technology as an endurance test (think of Netflix's war on sleep, for example). This led to the rise of the power user – the binge-watcher, the sleepless Twitcher, the super-fit cyclist who watches Netflix on the built-in screen of his Peloton bike (Denson 2023). The real power user, however, is often a disabled user who hacks and tweaks technologies by engaging in "crip technoscience" (Hamraie and Fritsch 2019). Instead of "golden hands" – the industry standard for avid gamers (Parisi 2017) – disabled users have navigated games by using "capacitive head and mouth sticks, switch access (via eyes, tongues and other body parts), and 'sip and puff' (assistive technology used to send signals using air pressure through a straw, by inhaling – 'sipping' – and exhaling, or 'puffing')" (Goggin 2017, 1569). This multisensorial skill set opens up exciting and innovative ways to study technology while resisting the ableist focus on hand-eye interactions.

Both the power user and the decorporealization myth support a broader trend of ascetic technology. Neta uses the term "ascetic" to conjure how digital technologies recast biological needs such as sleep, rest, and nourishment as obstacles to screen engagement and enhanced productivity (Alexander, forthcoming). The recent tech backlash is generating important works in critical algorithmic studies, interface design, and media studies, yet scholars studying the very real dangers of surveillance capitalism or algorithmic bias mostly tend to ignore how ubiquitous screens reshape the human body in detrimental ways. Critical disability studies, on the other hand, returns us to the lived, embodied, and singular experiences of bodyminds. These bodyminds have limited and fluctuating levels of energy, in contrast to

the bodiless minds that will be uploaded to the cloud and live forever after planet Earth becomes uninhabitable.

What Disability Can Do for Media Theory

Media theorists from Marshall McLuhan to Lev Manovich assumed able-bodiedness as a preliminary requirement for full participation in techno-social worlds (Sharma and Singh 2022). McLuhan famously likened media objects to prostheses enabling users to "conquer nature" by extending and enhancing their physical and cognitive capacities (Petrick 2022, 399). Yet medical prostheses always involve friction, discomfort, and pain, as the live tissue rubs against a nonbiological attachment. Critiquing the frequent use of terms like "prosthesis" and "amputation" in media discourse, Elizabeth Petrick warns that "[w]hen a marginalized group is treated as merely a metaphor, they become further erased from the history they were a part of" (2022, 401). But what if we stood this trend on its head and made the impaired user the focal point through which to study how technology reshapes the body? What can a postural and embodied sensitivity reveal about media histories and roads not taken?

The human body is implicated in how we consume media, and thus understanding how different people watch, listen, and otherwise use technology is crucial for any historicization. In fact, when we trace the origins of ubiquitous interface design features, nonaverage users emerge at every turn. Blind and Deaf users pioneered ways to compress time and control the playback speed of media, paving the way to speed listening and speed watching (Mills and Sterne 2020). Netflix subscribers who struggle with invisible disabilities like PTSD, depression, and suicidal ideation successfully pushed the company to allow opting out of its autoplay feature (Alexander, forthcoming). And people with insomnia, chronic fatigue, and other sleep disorders are central to understanding how light-emitting digital screens impact sleep (Alexander, forthcoming). Users with disabilities are canaries in the coal mine because their experiences navigating and using technologies not made to accommodate them can help us explore the unpredictable, counterintuitive, and uninterrogated effects of our growing dependency on personal electronics and constant connectivity. Studying disability hacktivism can help us replace technological determinism with a relational understanding of mediation-as-negotiation.

A disability-informed approach to media history can also push against the universalization of the spectator, user, or listener as male, white, and

able-bodied without ascribing value or hierarchy to one embodied position over another. This can reveal how able-bodied users adapt to the extraordinary demands of an ableist world by engaging in crip spectatorial activities pioneered or made possible by people with disabilities, from speed watching to the use of light calibration tools such as night mode.

A focus on the nonaverage user can uncover how software and hardware create and encode inequalities of access to media and information even when they are used to circulate films and television shows committed to inclusivity and social justice. Mapping the tension between diverse and empowering content and the addictive design tools and "dark patterns" through which it is accessed is crucial for an understating of digital media and its discontents.

All this is to say: disability opens up the imagination. We live in a moment where we need to be demanding better worlds, where it is not enough for scholarship to simply be a *response* to politics on the ground. In disability studies, there is no equivalent term to "gender" or "race" or "sexuality" or "class" to designate the field of differences onto which ability, disability, capacity, and debility are mapped. Tobin Siebers used the term "the human variety": attention to disability allows us to better understand technology from the perspective of ever-changing bodies, capacities, and limitations (2008). In her wonderful *Activist Affordances*, Arseli Dokumaci studies the body techniques of people with chronic pain from inflammatory arthritis – how to pick up a cup of coffee, how to put on a shirt, and so on. The second half of the book provides a catalogue of ways of moving through the world, focusing on gestures and task series, the appropriation of materials to build or modify technologies, and interdependencies with others (Dokumaci 2023, 99-226). The work begins with her ethnographic subjects and then builds out to an analysis of the built world from and through them. There is not yet an equivalent work on media – but there should be. This approach to technology connects the long history of technology-as-technique with a sense of human variety. By beginning from disability – and keep in mind, Dokumaci is working with just one kind of disability – whole ways of organizing life and relating others are opened up.

Here's one example of how this might work. With Meesh Fradkin, Jonathan has been interviewing disabled sound artists and musicians. We learned from Andy Slater, who is blind, that blind musicians and audio engineers prefer ProTools over other audio mixing and editing software because is it scriptable, and a whole generation of blind engineers have developed ways of working with it. So much talk in the world of software is about accessible visual design and open source. ProTools fails miserably on those fronts: the visual interface is a rather ugly reminder that the software

was first designed in the 1990s, and Avid is a hated media corporation among media professionals (and they just got bought by private equity, so it is about to get worse). But amidst all that, because of this scripting feature, ProTools works better for blind users than any of the many "more progressive" alternatives. Without a consideration of disability, scholars have been missing an important dimension of the politics of software. If other media are possible, if our job as scholars is to help that project along, then we should begin with the people who are already reworking media technologies right in front of us.

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PART IV

Archaeologies of Media

10. Coming to Terms with the "Smart" Phone

Wanda Strauven

Abstract

This chapter explores the rich terminology of the mobile phone in various European languages, from the Belgian "GSM" to the French "portable," and from the Italian "cellulare" to the German "Handy." What do these different terms promise, proscribe, and "technicize"? Which techniques and gestures are imbedded in brand names like BlackBerry and iPhone, or in more generic terms, such as cell phone and PDA? And why did the term "smartphone" never really kick off in everyday language? These questions are at the basis of a personal journey that takes the form of a terminological reflection with forays into the history of confectionary, literacy, smileys, and gaming. Ultimately, it briefly considers the phone's role in the creation of a new type of cinema.

Keywords: mobile phone, Smarties, smileys, mobile gaming, plastic archaeology, personal media archaeology

My Fake BlackBerry

The term "smartphone" was allegedly coined by Ericsson in 1997 for a prototype that never reached the market (for reasons I will come to below). Thus, it started off as the name for a failure. In that same year, in June 1997, computer scientist Philippe Kahn hacked a Motorola StarTAC flip phone by hooking it up to a digital camera and a laptop computer so that he could take a picture of his newborn daughter and upload it instantaneously to a webserver that friends and family could log onto after receiving an email alert. Baby Sophie's photo entered history as the very first cell

Fig. 10.1: Nokia E61. From author's personal collection.

phone picture.[1] About ten years later, when my daughter was born, I created a website featuring a photo album where each day I would upload a new baby-in-action picture, which was then still taken with a non-phone camera. In my early years of motherhood, I mainly used a digital point-and-shoot camera for documenting this new phase of my life. During that period, I was also a proud user of a Nokia E61 that came with a 4.5 x 6 cm LCD screen and a full keyboard (Fig. 10.1). I remember how my Nokia was often mistaken for a BlackBerry, even if it was silver-colored instead of black and its keyboard buttons were squared and not shaped like drupelets – the most recognizable feature of the classic BlackBerry (and the fruit after which it was named). This might have been a symptom of BlackBerry's success as a brand name and its potential for becoming a generic trademark before other smartphones conquered the market and BlackBerry rapidly lost ground.[2] Introduced in 1999 as a two-way pager, the BlackBerry smartphone was released three years later, but most users would call their device by its brand name rather than referring to it as a "phone." In terms of fruit sizes, it can be said that an apple fits better in the hand than a blackberry, but then Apple called its smartphone "iPhone."[3] It was Steve Jobs who famously announced its "birth" at the Macworld Convention on January 9, 2007.

For many years, I resisted the iPhone temptation, attached as I was to my Nokia E61. I liked its (fake) BlackBerry shape and the tactility of its QWERTY keyboard that would allow me to type much faster than my friends who still had a cell phone with a twelve-button keypad. But most important was its affective value: after all, it was the phone my baby girl

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1   When *Time Magazine* included Kahn's picture on the list of the 100 most influential photos of all time, it was said to have "forever altered how we communicate, perceive, and experience the world and laid the groundwork for smartphones and photo-sharing applications like Instagram and Snapchat. Phones are now used to send hundreds of millions of images around the world every day – including a fair number of baby pictures." (TIME 2016)

2   On the rise and fall of BlackBerry, see McNish and Silcoff 2016.

3   One of the main reasons behind the bite in the Apple logo is precisely scale, as it would allow distinguishing it from a cherry. See, for instance, Conradt 2015.

grew up with. My Nokia E61 bond lasted beyond my daughter's toddlerhood. So it should come as no surprise that it also became an improvised toy in her hands. One day she accidentally opened the calculator application, making a grid of buttons appear on the screen that she tried to push with her little fingers, as if it were a touchscreen. Yet her favorite "game" was typing on the physical keyboard. She quite soon understood that the phone was not just a mini-typewriter but also a message sender. Once she knew all the letters of the alphabet, at the age of four, all she

Fig. 10.2: Sending a message with mommy's phone. Summer of 2012.

wanted to do was send her own messages. Obviously, she could not write on her own yet, but she knew how to use the smartphone's full alphabet keyboard while I dictated letter by letter, word by word, at her request. Often she would add a decorative string of "little monkey tails," as at-signs (@) are called in Dutch (Fig. 10.2).

Literacy and gaming are just two of the many aspects that I will explore in this terminological quest that is interwoven with my personal life, an ongoing research project on children, and childhood memories. It can be considered a form of personal media archaeology that connects my own narrative (mostly on the level of anecdotes) to some larger narrative of media history, which is "practiced" in a media-archaeological fashion, not as a technologically progressive development but as a nonlinear entanglement of various historical layers. In this case, I am looking at (or rather stumbling upon) the hidden genealogies of the smartphone, ranging from the production of sugarcoated chocolate candies (Smarties, Bonitos, M&Ms) to the phenomenon of "plastic archaeology" on the beach, and from the success story of the smiley as pre-emoticon icon to the craze of early mobile games like Pac-Man and Snake. Which of these layers brings us closer to the "smartness" of the smartphone? What makes the smartphone "smart"? What other promises does the term entail?

I am less intrigued by the smartphone's technology (or its evolution as a technical device) than by the history of its various terms, and what those terms can tell us about the emergence of new techniques and gestures that come with the device. Following Benoît Turquety's distinction, I am adopting here the French notion of *technique,* which is broader than the English

one, as it does not separate the gesture from the machine (or technical object, as Gilbert Simondon named it). In French, *technologie* refers to the science that studies *techniques*, while the latter is a combination (or, even better, intertwinement) of technical objects and procedures. Machines and techniques, as Turquety puts it, are "complementary aspects of one single phenomenon, that is to be understood in its complex cohesion" (2018, 243). I suggest searching for the procedures or gestures that are embedded in the terminology, as a variation on the Latin saying *nomen est omen*: namely, the technique is in the name (*technē estin en onoma*; in Greek, τέχνη ἔστιν ἐν ὄνομα).[4]

Can I Phone You Tomorrow?

In the early 2010s, it seemed that "iPhone" was on its way to becoming a generic trademark, taking over from "BlackBerry." It was a smart term, short and deceptively personalized, as if the homonym of the verbal construction ("I phone") ensured a close relationship between the user and the device ("my phone"). It was immediately clear that this relationship would involve much more than the technique of (tele)phoning (others), especially thanks to the capacitive touchscreen and the new visual functions of (self-)image capturing and displaying that were added to the more traditional telecommunication tools, like emailing or texting. Yet to this day the original iPhone's successors and its competitors are still considered, or simply called, phones. Launched in January 2007, Apple's smartphone was logically named after its "siblings" iMac and iPod, with the "i" referring to the internet – as well as to "individual, instruct, inform, inspire," a nice list where the term "intelligent" is conspicuously missing (Griffin 2016). Its success in becoming a metonym for a specific noun seemed to lie in the fact that the trade name contained that noun: after all, the iPhone was a phone. Yet it is the iPod, and not the iPhone, that made it into the list of most common generic trademarks in the mid-2010s (Atkins 2013). Now discontinued and disappearing also linguistically, the term "iPod" used to stand for all portable music devices.

In the mid-2010s, I began using "iPhone" as a common noun in conference papers and early versions of book chapters for the collaborative research project on children's creative and playful media uses, entitled #kinderspiel,

that I had started with Alexandra Schneider.[5] In 2012, Schneider had contributed to the edited volume *Moving Data: The iPhone and the Future of Media*, which was symptomatic of the euphoric iPhone experience at that time and its promise as "an ever-expandable mobile media machine" (Snickars and Vonderau 2012, 2). In her contribution, Schneider proposed reading the iPhone as an "object of knowledge" and discussed, among other things, how the new touchscreen-based gesture of pinching could be placed in the register of love. Interestingly enough, she also recounted how Apple failed to register "iPhone" as a trademark in Switzerland, as it was argued by the court that, "unlike the brand name iPod, which is a new verbal coinage without precedent in any natural language, iPhone is a homophone of an English language sentence," therefore belonging to the public domain and unprotected by intellectual property laws (Schneider 2012, 59).[6] One might also observe that "iPhone" made a nice couple with another pronominal media coinage – that is, "YouTube" – to which the same editors, Pelle Snickars and Patrick Vonderau, had already dedicated a volume in 2009.[7]

In the early 2020s, after having put our book on hold for some years, Schneider and I began revising its chapters and realized – with a certain historical distance – how some of the terminology no longer applied, or at least needed to be updated, which included abandoning the use of "iPhone" as a generic trademark. On the one hand, this was clearly related to the increasing popularity of Android devices over the past decade; on the other hand, it also appeared that older terms persisted in the everyday language of (our) different cultural-linguistic contexts within Western Europe.[8] In Belgium, for instance, the acronym "GSM" is still commonly used by both Flemish- and French-speaking communities as a *totum pro parte*. Originally referring to the committee *Groupe Spécial Mobile* that was created in 1982 to develop a European standard for mobile telephony, GSM came to stand for

5   The project was officially launched at the 2014 NECS conference in Milan, where we presented the beta-version of our blog, "Kinderspiel: A Project on Children as Media Archaeologists, Media Makers and Media Players." See https://kinderspielproject.wordpress.com.

6   However, it should be mentioned that the verb *to pod* exists in the English language, more specifically in the meaning of producing pods of plants, thus without explicit reference to the music industry or the use of portable media players.

7   In 2010, Jan Simons would bring the two terms together in a pun to serve as the title of an article: "YouTube but iPhone" (2010).

8   This perspective is by definition limited and would need to be expanded beyond European boundaries, also in response to the more general critique of media archaeology's Eurocentrism. On the urgency of global(ized) media archaeology, see Morgan 2022. More specifically, for a study of mobile phones beyond Western boundaries, see Blaylock 2015, 2021. Jennifer Blaylock's postcolonial media archaeology focuses on the history of new technologies in Africa.

the standardized system itself (Global System for Mobile communications), which was first implemented in Finland, the home country of NOKIA, in 1991.[9] While Belgians will ask for each other's GSM number, the Dutch call it their 06 number, which refers to the nationally standardized area code for mobile phone numbers. In the Netherlands, the device operating a 06 number is colloquially (and diminutively) called "mobieltje," reinforcing the notion of mobility that distinguishes it from landline phones. In Italy, on the other hand, it is the notion of cellular data usage that takes precedence over the size of the device, nowadays less frequently called "telefonino" (small phone) than "cellulare" (cell phone). And let us not forget the wonderful term used in German-speaking countries, "das Handy," which emphasizes, whether intentionally or not, the device's convenience as well as its handheld (and hands-on!) dimension.[10]

Handy Terms

From a Latourian or Actor-Network Theory (ANT) perspective, one could say that the German expression "das Handy" reflects one of the artifact's most fundamental prescriptions, that is, that users hold the device in their hands.[11] Conversely, it projects human qualities to the nonhuman, as it turns the phone into a hand(y). In other words, the German (nick)name for the device is profoundly McLuhanian, as it implies that the hand has become an extension of the human body. But it also anticipates the emergence of new bodily techniques, especially hand gestures, formed or shaped by the new technical object. As a *pars pro toto* for the body, which Marcel Mauss defined as "man's first and most natural instrument," the hand will undergo physiological changes by its constant use of the phone; in short, the hand will become the phone (1973, 75). Already in the early days of the twenty-first century, half a decade before the release of the first-generation iPhone,

9   With Australian, North American, and Asian providers shutting down their GSM networks since 2017, GSM as a 2G network is on its way toward extinction. Yet, according to Wikipedia, the acronym GSM has become a generic term for designating the "plethora of *G* mobile phone technologies evolved from it." See https://en.wikipedia.org/wiki/GSM.

10   In fact, the origins of the German term are disputed, but most likely it emerged as an Anglicized abbreviation of *Handfunktelefon* (handheld mobile phone). It should also be mentioned that the Swiss use their own term, the generic trademark "Natel" – a radiotelephone brand name that originated from *Nationales Auto-TELefonnetz*. See https://en.wikipedia.org/wiki/Natel.

11   On the notion of prescription as a "behavior" that the nonhuman imposes on the human, see Latour 1992.

concerns were raised about possible transmutations of the thumb due to an increasing use of the short-message-service (SMS) protocol that youngsters had adopted for texting by multi-tapping the twelve-button keypad of their phones (Cloosterman 2002). This led to the development of a new language, SMS shorthand, with its text-based emoticons (Taylor and Vincent 2005).

Paradoxically, the hand seemed more independent of, or at least less reliant on, the sense of sight *before* the introduction of the touchscreen. In retrospect, it can be said that the operation of early cell phones, with their small screen and twelve physical buttons (from 1 to 9, plus 0, *, and #), was truly tactile; for instance, as some will nostalgically remember, it allowed for composing a SMS in the darkness of the movie theater by depending on fingertip sensitivity and blind typing experience. It is precisely because of the eye dependency of touchscreen gestures that more recent physiological concerns no longer relate to our thumbs but rather to the curve of our spine, which is compromised by constantly looking down at our devices – a body posture typical of the antisocial habit of phone snubbing or *phubbing* (Strauven 2016).

On the other hand, the medium's promises of freedom and unlimited accessibility and/or data usage are embedded in terms like the Dutch "mobieltje," the French "portable," the Italian "cellulare," and even the Belgian "GSM," as it stresses the link with the available (2G) network. Despite the international scope of our research project that brings together material from children growing up in different European countries (and languages), Schneider and I abandoned the *couleur locale* of these geographical terminologies, while updating the book, in favor of the more generally accepted English terms "cell phone" and "mobile phone." If the iPhone's interconnectivity or internet-based apps might best be captured by the expression "cell phone" (or, colloquially, "cell"), it is our inclination to use "mobile phone" as a common denominator for all phones with a so-called mobile phone number, that is, all phones, old and new, real and imaginary (or imagined), that are not landline phones.[12] The phone's mobility is related to its other basic feature: portability. The two are complementary to each other: portability implies compact size, light weight, and ease to carry (in your hand or in your pocket), while mobility underlines the possibility to go from one place to another, to be on the move, out of your house, on the street, and in the world (the promise of ubiquity).

12   Historically, this is also the oldest term emerging in the mid-1970s in the wake of the race between Motorola and Bell Labs to make the first call on a handheld mobile phone. According to the Merriam-Webster Dictionary, the first known use of the term "mobile phone" was in 1975, while "cell phone" appeared in 1983.

"Only Smarties Have the Answer"

But what about the smartphone? Why not simply replace "iPhone" with "smartphone"? Not only does this term have the advantage of not being a brand name, it also predates the iPhone's launch by a decade. Introduced by Ericsson in 1997, it has been widely adopted since then, at least in writing, from sales and marketing to journalism and academia. Yet, as Schneider and I had to conclude, the term was not – and still *is* not – frequently used in everyday speech by smartphone users themselves. Indeed, who says: "Where is my smartphone?"; "Did anyone see my smartphone?"; "I love your new smartphone!"; "Wow, that's a cool smartphone you have there!"; and so on? In our perception, people tend to simply call their smartphone a "phone," even if they are rarely using it for the purpose of making voice-based phone calls (that is, phoning). A telling anecdote, which we also recount in our forthcoming book, is that once, in Italy, my old compact camera was (mis)taken for my new phone by an eight-year-old boy. Along with some other mothers, I had accompanied a group of second graders to the park and we had asked them to line up on top of a little wall and pose for some pictures. When I took my camera out of my purse, the boy asked in great surprise: "Is that your new phone?" The boy used the generic Italian term "telefono." Let me emphasize the technique behind my gesture: I was not making a phone call but taking a picture!

To stay within the anecdotal register, it was about the same time that I asked my daughter, then also a second grader, for a definition of the smartphone while I was preparing one of my classes.[13] If I remember correctly, I asked her if she knew what the term "smartphone" stood for. Without hesitation, she answered: "Smarties!" As my follow-up questions remained unanswered, I just smiled and let her return to playing. But of course I wondered if there was more at stake than simple wordplay. What had prompted this association? Was she thinking of the phone as a candy? Had she already discovered Candy Crush (available on iPhones since November 2012) and been playing it behind my back? Or did she make a "smart" connection between the colored chocolate candies and iPhone's icons or, even better, the smileys of its messaging app?

From a media studies perspective, the history of Smarties is quite revealing, as it covers very diverse areas ranging from the techniques of branding and packaging to literacy, education, and environmentalism. For clarity,

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13   This was during my teaching appointment at the University of Udine in the academic year 2015-2016.

I am not talking here about the candies produced and distributed in the United States under that name, which come in the form of chalky tablets. The reference point for my daughter must have been Nestlé's oval-shaped and sugarcoated pieces of chocolate, originally introduced as "Smarties Chocolate Beans" by the British confectionary company H. I. Rowntree & Co. in 1937, then shortened/rebranded as "Smarties."[14] In Europe, and later also in Canada and other parts of the world, they became extremely popular largely thanks to the witty advertising puns and questions (to which "Only Smarties have the answer"), the colorful cylindrical boxes that you could shake as a rattle, and the plastic lids which were imprinted with the letters of the alphabet (and occasionally with a limited edition design, like spaceships or football phrases). There was the thrill of opening the tube to discover which letter you got on the lid, as it was "embossed on the underside, so you could run your finger over it like Braille" (Cocozza 2013). Considered a "useful teaching aid," these lids were supposed to encourage kids to recognize the letters, to collect them, and to create words with them. In 2005, Nestlé introduced the hexagonal box or hexatube, replacing the plastic caps with cardboard lids, which put an end to this sweet hobby of collecting.

Yet the linkage between literacy and confectionary, which was part of Rowntree's "smart" marketing campaign, suddenly took on an ecological twist at the beginning of the twenty-first century when Smarties lids were washing up on beaches, as happened, for instance, on the English Channel coast of Cornwall. As a form of "plastic archaeology," which is the term used by the Cornish Plastic Pollution Coalition (CPPC), these artifacts can now be dated fairly precisely due to changes in size, font, and manufacturer, and as such they are "an excellent example of how long plastics last in the environment" (Channon 2018). As one of the CPPC coordinators observes: "They also pose the question of where some of these vintage plastics are coming from – erosion of sand dunes/landfill, etc., as well as from the sea itself" (Channon 2018).

While it is easy to imagine the letter lids being arranged in sentences or even as a keyboard of an improvised toy computer, they must surely have been (mis)used in all kinds of games. Indeed, when Nestlé announced they would discontinue the tube-shaped packaging, some childhood memories

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14   Founded in 1862, Rowntree's had been producing so-called chocolate beans since 1882, more than a century before they were acquired by Nestlé, which happened in 1988. The beans were renamed "Smarties Chocolate Beans" in 1937 by the firm's marketing director George Harris (Potts 2017). According to a collector's facts page, the shorter brand name "Smarties" was introduced in 1938, together with the cylindrical Smarties tubes, which quickly became collectables (northerntrumpet 2008a).

about lid shooting were posted in online comment sections: one person refers to it as "karate-chop," while another explains how the fun started after having eaten all the Smarties, as you would put the lid back on the empty tube, "rest it on a surface, and bang the edge of your hand down hard about half way along the tube, to see how far you [could] fire the plastic top" (*BBC News* 2005). Incidentally, TV commercials of the 1980s featured the lids as flying saucers or sliding discs going through the maze of a pinball machine or the like.[15] The animated adverts were also responsible for introducing Smarties with faces or, rather, *as* faces, very similar to the smiley face icon. A 1988 ad, for instance, features two children at a kitchen table looking inside a Smarties box and discovering an (animated) world full of colorful and happy faces, some with fancy sunglasses or long eyelashes, others with a bowtie or a presumptuous moustache (donkeyshines 2011). Nestlé's Smarties occasionally had drawings printed on the candies themselves (from Smartians and bugs to the Canadian maple leaf) (northerntrumpet 2008b), but the key question is: Did they ever come with the smiley design?

Funny Faces

In my memory, Smarties did come with funny faces in the 1970s and 1980s. That's probably why I immediately made a connection with the facial emojis after my daughter's smart(ies) exclamation. Yet my internet search – skimming fandom pages in various languages, visiting discussion forums, and looking for images and vintage ads – yielded nothing. Until I found the Bonitos …

Passing for France's Smarties, Bonitos were owned by Mars and sold under that name in various European countries from 1955 to 1986. In the mid-1980s, however, "Mars candy company abandoned successful European brand names in the pursuit of standardized global brands" (Herbig 2014, 46), and this is how, for instance, Raider became Twix and how Bonitos, together with the chocolate-covered peanuts Treets, were renamed M&Ms. As is well known, the first M of M&M stands for Forrest Mars, while the second refers to Bruce Murrie. As the sons of two competing confectionary families, Mars and Hershey, Forrest and Bruce had partnered up in the early

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15   Compilations of Rowntree's and Nestlé's adverts can be found on YouTube. See, for instance, Smarties lids sliding through a maze (Webster 2015, 3:55; https://www.youtube.com/watch?app =desktop&v=gVGwg2YmloE) and Smarties lids as flying saucers (Acidonia15oreborn 2021, 0:30; https://www.youtube.com/watch?v=_fp5zyQxObg&t=193s).

1940s to launch the American version of Smarties.[16] According to the Hershey Archives, Forrest maneuvered Bruce out of the partnership in 1948, so M&M became *de facto* a single M – like the trademark "m" which is printed on their chocolate sweets. The renaming of Bonitos in the mid-1980s was indeed accompanied by the printing of this lowercase letter on every candy, forever changing the face of those "funny little heads full of milk chocolate" (*drôles de petites têtes pleines de chocolat au lait*), as Bonitos used to be advertised.

In the early 1970s, Bonitos had become the testing ground for the lucrative licensing potential of the smiley, trademarked in 1971 by French journalist Franklin Loufrani. Whereas freelance artist Harvey Ball, the American "inventor" of the smiley face icon, forgot to register a trademark on his very simple drawing ("a bright yellow circle with black oval eyes and a creased smile"), Loufrani was born with an entrepreneurial spirit and immediately secured a French trademark for a very similar drawing, also in yellow, which he famously launched on the front page of the newspaper *France-Soir* on January 1, 1972, to "alert readers to positive news" (Crockett 2022). In 1973, Mars became Loufrani's first business partner, with Levi's and Agfa following, and so Bonitos became candies with smiley faces.[17]

Yet, like Smarties, Bonitos came in different colors – with brown, red, green, and yellow as the basis, and orange and pink as additional variations – and their funny faces were not just smiley: some would stick out their tongues, others would be winking or wowing. In fact, another advertising slogan humorously defined them as "a bunch of little jokers with a heart of chocolate" (*une bande de petits rigolos avec un coeur en choco*). The simple design of their faces somehow – anachronistically – evokes the technique of the ASCII-emoticons, which would emerge in the 1980s and become the center of attention of Loufrani's son, Nicholas, in the late 1990s (Collomp 2010). In short, the yellow smiley icon that would become associated with

16   The legend goes that Forrest Mars got the idea for his chocolate candy in Spain during the Spanish Civil War (1936-1939) where he had seen soldiers eating Smarties. After his stay in Europe, where he had created the famous Mars bar and worked for companies like Nestlé and Tobler, he partnered up with Murrie for the creation of M&Ms. Launched in 1941, M&Ms were first exclusively made for the soldiers at war. Originally, they came in cylindrical tubes, like Smarties, but in 1948 the packaging was changed to brown plastic bags, still in use today.

17   Given Loufrani's partnership with Mars, one would assume that M&Ms also became imprinted with smileys, but I have found no evidence of this so far. M&Ms appear as animated figures in commercials and on merchandise, always with the "m" very prominently on their bellies and the facial features limited to the upper part of their bodies, which take the form of a slightly stretched circle. On the other hand, M&M candies would become available with special party texts and designs. Since the 2010s, personalized printers have been installed in M&M shops allowing customers to make and print their own designs.

house music and ecstasy in the late 1980s has a multicolored and multi-expressive past.

Snapping Games

Where does this candy genealogy lead? From Smarties to Bonitos, from the former's plastic letter lids to the latter's humorous faces, there is a clear investment in language education and visual communication which, it could be claimed, the smartphone (or rather its users) would bring together in the technique of texting. But I would like to draw a bit further on the entertainment side of the candies, as they were not only introduced as funny characters but also envisioned as building blocks of gaming. This started in the early 1980s, three decades before the release of Candy Crash Saga, when Rowntree's came out with a robot-themed Smarties commercial featuring a "very smartie" robot playing a slot machine and hitting the jackpot with three red candies in a row. Most remarkable is the three-second opening of this commercial, which offers a variation on the Pac-Man arcade game: the Pac-Man character, here wearing a green cap, eats its way through the blue-lined maze snapping its mouth open and shut as in the original game, but the dots have been replaced by Smarties in all the different colors and the center of the maze is occupied by a Smarties box.[18]

In those years, Pac-Man became available on home video game consoles, Atari and Nintendo, and then, in the 1990s, on the portable Gameboy device. On the one hand, it can be said that Gameboy, together with other handheld apparatuses such as the personal digital assistant (PDA), prepared the ground for the smartphone; on the other, it is the smartphone that arguably marked the beginning of the technique of mobile gaming. I am referring here to the smartphone both as a device and as a concept, the term itself entering the vernacular in the second half of the 1990s.

In the language of engineers, more specifically in the field of computing, the term "smart" has a long history, being used with reference to systems with processing power. In other words, it does not necessarily have an intelligent connotation (comparable to AI) but is linked to the technique of processing data. From this perspective, I wonder what my new neighbor, a first grader in New York City, means when he calls his father's smartphone

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18   See https://www.youtube.com/watch?v=kYbKvBBvAG4 (Retrontario 2016). Questions about copyright arise here, as Rowntree's ad unmistakably copies the screen design of the Pac-Man arcade game.

a "dumb phone." Is the phone obsolete? Is it not functioning properly as a system with processing power? Or is the little boy simply not satisfied with the answers the device produces or the games it has on offer?

According to the Oxford English Dictionary, the first appearances of the term "smart" in combination with "phone" can be traced back to 1980, but those were two-word occurrences with *smart* usually placed between scare quotes. The Merriam-Webster Dictionary, on the other hand, dates the first documented use of the term "smartphone" to 1996, which is the year that Nokia released its 9000 Communicator. Yet this new device was not advertised as a (smart)phone but rather as an all-in-one communication tool that fits in your "jacket pocket" and allows you to have "Everything Everywhere."[19] Two years earlier, IBM had released its Simon Personal Communicator, generally considered the very first smartphone for combining the mobile phone with PDA features in one device, which had already been achieved by IBM in their 1992 prototype known under the code name "Sweetspot." In 1995, IBM Simon was presented on American television as an "interesting PDA built around the cellular phone," enabling a businessman waiting in a hotel lobby to be fully "computer functional" and not waste time.[20]

The year that interests me here is 1997. Exactly ten years before the launch of the iPhone, Ericsson developed its GS88, code name "Penelope," and Nokia announced its 6110. While the former never reached the market, it came with Ericsson's coinage of the term "Smart Phone," which was printed on the packaging designed for the device. One of the shortcomings of this prototype seems to have been its weight. Like Nokia's 9000 Communicator, Ericsson's GS88 had a lid covering a full QWERTY keyboard and touchscreen with stylus. Among its features were "16-bit operating system GEOS, POP3 email, SMS, world clock, browser, speakerphone, integrated modem, infrared port

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19   Here is a transcript of the TV commercial: "Nokia 9000 Communicator. It's everything you need to communicate when you are on the move but it's so small it fits in your jacket pocket. The Nokia 9000 Communicator. Everything Everywhere." See https://www.youtube.com/watch?v=eyv49CqC6D4 (İlişkiler 2015).

20   This is how Stewart Cheifet introduced the IBM Simon on the PBS TV show THE COMPUTER CHRONICLES at the beginning of the episode entitled "Mobile Computing" (1995): "I am in the lobby of the Marriott Hotel in San Francisco waiting to meet someone and they are late, and I got work to do, and I can't find AC or a phone line, but no problem. I am totally computer functional thanks to this Simon PDA of BellSouth and IBM. It is a really interesting PDA built around the cellular phone. So with it I can get a page, I can check my email, I can send or receive faxes, I can use it to make a phone call, *of course*, and I can use it like a normal PDA. I can check my calendar, I can look up a phone number, even scratch a note to myself on this touch-sensitive screen" (emphasis added). See https://www.youtube.com/watch?v=S8Mgc8dYLro&list=PLR6R S8PTcoXTO90bAQSR2zQm6otJPQ7RA&index=6 (The Computer Chronicles 2013).

and PC connection" (Ericssoners 2016). Nokia's 6110, on the other hand, was successfully released in 1998 and had three games preinstalled: Memory, Logic, and Snake – that is, a variation of the old card game, a precursor of today's Wordle ("but with pictures instead of letters"), and a mobile upgrade of a two-player arcade game, respectively.[21]

Snake immediately became a phenomenon: it was simple, fun, and addictive. There was no maze as in Pac-Man, but you had to move the snake around in a similar way, up and down, right and left, in order to eat pixel candies. In the Nokia 8290 User Manual, the game is described as follows:

> Feed the snake with as many goodies as possible and watch it grow. Use keys 2, 4, 6, and 8 to turn the snake toward food. The longer the snake's tail grows, the higher your score. If the snake runs into its own tail or the surrounding wall, the game is over. (Nokia 2000)

While Snake could be played as a two-player game by pointing the infrared ports of two phones at each other, it must have been its one-player version that made the game extremely popular.[22] More generally, Nokia's preloaded games turned the smartphone with its monochrome 2.5 x 3.5 cm screen into a very portable and individual game console, and phone users into mobile gamers.

The Phone Says "I" (Not "Hi")

In the early years of the twenty-first century, Thomas Elsaesser formulated some hypotheses about cinema in the digital age in a seminal text that would lay the foundation for his "film history as media archaeology," outlining two possible scenarios or "killer applications" for digital multi-media, as he then called it. What would conquer the market in the near future? Would it be the "play station computer-game" as a true convergence device, or would it be the "mobile phone as mini-laptop" (Elsaesser 2005, 17)? While envisioning these two ways forward as "possibly distinct," Elsaesser may have underestimated at the time the possibility of their total merging – that

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21   On Logic, see tylaste 2022; https://www.reddit.com/r/nokia3310/comments/g8nre3/retro_nokia_game_logic/. On the history of Snake and its precursors, see Angelos 2021.
22   Like many vintage games, the original Snake '97 is available for downloading on today's smartphones. You can choose between seven different Nokia phones, each with their own screen and twelve-button keypad, to be operated on the touchscreen.

is, of the smartphone becoming not only a mini-laptop but also a game console. Instead, he wondered:

> Will it be the sheer everyday usefulness, the universal popularity, and – lest we forget – the ruinous sums telecom firms have invested in licenses for "third-generation" cell phones that wins the day, or kids playing computer-games that simulate ever more sophisticated parallel worlds? Whatever redefines the function of sound-and-images combinations in our culture, the entrepreneurial risks and the profitable stakes are equally high. (Elsaesser 2005, 15)

Taking the publication delay into account, this text was written half a decade before the iPhone was released, when the new generation of media users, among them Elsaesser's students at the University of Amsterdam, were in awe of the latest flip phones.[23] Elsaesser does not use the term "smartphone" but refers to it as "mobile phone," "cell phone," and "telephone." As a groundbreaking thinker, he urges cinema scholars to fill the gaps of traditional film historiography, to question its absences and to include, among other things, the history of mobile telephony. Whereas the history of telecommunication had already been addressed by other cinema and media scholars (see, for instance, Ronell 1989; Gunning 1991; Uricchio 1997), Elsaesser proposes integrating the telephone's genealogy into film history because of the role played (or, rather, to be played) by the mobile phone in the field of cinema. It is an imagined future for (new) film historians, a history that was about to materialize in the early years of the twenty-first century.

Another early attempt to inscribe handheld telecommunication devices into the history and theory of visual media is Heidi Rae Cooley's 2004 illustrated essay "It's All About the *Fit*: The Hand, the Mobile Screenic Device and Tactile Vision." Again, it must be stressed that this text was published before Apple's iPhone launch and the widespread use of smartphones. While inspirational for my research on the (early) touchscreen, Cooley's well-found acronym MSD (standing for "mobile screenic device") did not really catch on.[24] It was probably meant as a successor to PDA with the idea of drawing attention to the screen and its visual dimension rather than to the phone's "everyday usefulness," mentioned by Elsaesser. As Cooley explains in the

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23   A good example was the Motorola Razr V3, released in the fall of 2004. For a discussion of its "cool" TV commercial, see Strauven 2020.

24   Indeed, the copyeditor of my recent book strongly advised me not to use the acronym, as it is not widely adopted and would confuse the reader. See Strauven 2021.

first footnote to her article, MSD is conceived as an umbrella term for all types of handheld devices with an embedded screen, therefore including also portable cameras and game consoles. She writes,

> In addition to mobile phones and personal digital assistants, I intend mobile screenic device (MSD) to refer to digital cameras and digital cam-corders with color or standard LCD screens, as well as any other handheld electronics device with LCD screen, including handheld gaming devices, such as GameBoy. In employing the neologism, I emphasize the devices' integration of mobility and visuality, which becomes a characteristic of tactility. (Cooley 2004, 151)

With foresight, Cooley identifies an important shift from "window-ed seeing" to "screenic seeing," from transparency (seeing through) to opacity (looking at), from visual framing to tangible engaging – a trend that the smartphone would only reinforce. As the visual part of her essay also illustrates, this new way of seeing is literally in our hands. It creates a new bond, or relationship, between the user and the screen, between the hand and the device, which Cooley theorizes through the notion of the "fit" as a dynamic happening and a reciprocal molding.

The notion of personal relationship is also central to Roger Odin's writings on the mobile phone, to which I want to pay brief tribute here. In the early 2010s, the French film theorist introduced the concept of "p film" (or "p cinema") to indicate the new communication space for viewing films shot on mobile phones, with the "p" referring to multiple related notions (such as phone, portable, and pocket). As a semio-pragmatic scholar, Odin focused on the role played by the phone in our changing spaces of communication, by analyzing its impact on the cinematic viewing experience as well as on the production of films. The "p cinema" is a new form of cinema; it is "cinema made while thinking portable" (Odin 2016, 51). But it is also a very personal cinema, for the mobile/portable phone caused a shift "from an impersonal utterance, as Christian Metz described it [...], to a personal utterance" (Odin 2012, 168).

As Odin further explains, it is not film language itself that changes or that says "I." The passage from impersonal to personal enunciation is defined or made available by the new apparatus, by the camera embedded in the mobile phone, which is a personal device. Odin writes,

> It is the use of mobile as an everyday tool, the fact that it belongs to an individual (as opposed to the traditional phone that belongs to a place

or family), which enables it to give this personal value to the images it produces. (2012, 168)

While Odin's reflections mainly concern cinema's reconfiguration as a "cinema in my pocket," he also captured very well and succinctly the essence of the mobile phone as an "eminently personal device," as a "device that says 'I'" (2016, 52). Isn't that a wonderful observation? The phone as a device that talks in the first person, that is enunciative and self-affirmative, that says: "I." One might wonder if there is a better definition for the smartphone today, now that it also comes with mobile ID technology and facial recognition. So, after all, has it truly become an I-phone?

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11. The Afterlife of an Optical Device, or Making the Lantern Kosher

Doron Galili

Abstract

Exploring media archaeology's potential to trouble established notions regarding old and new media technologies, this chapter concerns a contemporary optical device dubbed Makrentz'ik – a toy magic lantern marketed for Jewish ultra-Orthodox (Haredi) children in Israel. In the context of the Haredi community's strict observance of Jewish laws and rejection of modern values, the outmoded technology of the lantern acquires a different cultural and ideological significance than typically assumed in media historiography. The Makrentz'ik, therefore, embodies media archaeology's preoccupations with rethinking temporalities – being at once an obsolete medium and, in its cultural context, a technological novelty. This raises new questions about how media cultures vary not only across distinct geographical locations and historical periods, but also on a regional and communal basis.

Keywords: media archaeology, magic lantern, optical toys, ultra-Orthodox Jewry, children's media

Long considered a keystone of early visual media technologies, the magic lantern has concerned some of the earliest studies to appear under the moniker of media archaeology (Ceram 1965; Mannoni 1994). Counter to today's media-archaeological scholarship, which established itself as a revisionist approach to media history that challenges linear and progressive media histories, these early studies typically placed the lantern in a teleological trajectory that from the get-go considered the cinema as its culmination point. Subsequent studies of the lantern have done a great deal to correct such impressions, liberating the lantern, so to speak, from "pre-cinema"

history. A rapidly growing body of work in books, journal volumes, and conferences in recent years, as well as several large-scale European research projects, have shed much-welcomed new light on cultural- and historical-specific characteristics of magic lantern aesthetics and practices from past centuries (see, for example, Vogl-Bienek 2016; Lenk and Majsova 2022; Dellmann and Kessler 2020).

This chapter reflects on historiographical approaches to media technology by considering the magic lantern from a different perspective, neither seeing it as part of the genealogy of cinema, nor framing it within a particular moment in cultural history. Instead, I offer a media-archaeological perspective (and, in turn, a reflection on media-archaeological methodologies) that focuses on the material properties of media technologies and aims at "rethinking temporalities," by way of troubling established notions of the relations between old and new media technologies (Strauven 2013, 67). While other media-archaeological studies of the lantern have primarily aimed at mapping out wider-ranging archaeologies of the screen or excavating forgotten practices and techniques of lantern performances (Huhtamo 2004; Ton 2019; Wynants 2020), my concern is with a contemporary case study. The lantern in question here is the "Makrentz'ik" (a Hebrew diminutive for "projector"), a children's toy projector that is presently marketed in Israeli and American Haredi (ultra-Orthodox) religious Jewish communities – the most strictly observant groups of Judaism. Emerging out of a cultural context that we rarely address in media historiography, the Makrentz'ik allows us to experiment with a media-archaeological excavation of a unique sort of magic lantern: one that appeared not as a precursor to cinema, but rather as twenty-first-century novelty. Thus, I shall argue, the Makrentz'ik – as a technological artifact with associated audiovisual texts – uniquely embodies media archaeology's preoccupations with the entanglement of the new and the old.

A New Invention out of the Past

The Makrentz'ik was first introduced in 2016 by the Malchus Waxberger company, a major producer of Jewish ceremonial art and print products based in the city of Bnei Brak in central Israel. Designed in Israel and manufactured in China, the Makrentz'ik is an electrically powered device capable of projecting still images off cylindrical cartridges that consist of miniature slides, as well as an electronic card upon which an accompanying soundtrack is recorded. A ring around the projector's lens allows for an

adjustment of the focus, and when projected on a wall the slides appear in decent sharpness up to a size of fifty centimeters square. The projector is light and portable and is very simple to use, even for young children, as it is operated with only four buttons and there are no written instructions on it.

About sixty slide cartridges of illustrated stories are currently sold for the Makrentz'ik, thirty of them in Hebrew, and the others in Yiddish and English. The vast majority of the cartridges are dedicated to simple stories with religious themes concerning Jewish characters from the distant past and their conflicts with antagonistic gentiles. The stories always conclude with happy endings, involving spiritual and material rewards. The slides are illustrated with brightly colored drawings, in what can be described as a somewhat naive style. Each of the cartridges consists of seventeen slides and their presentation lasts about twelve minutes when the Makrentz'ik operates in the automatic (and, compared to current norms of children's media, quite slow) playback mode. Users may also switch slides manually and turn the sound on or off, but the order of the presentation of the slides is not variable (Fig. 11.1).

Waxberger's webpage describes the Makrentz'ik as "an audiovisual magic lantern for the demonstration of tales of the sages of Israel." Calling the lantern "an amazing new invention," the webpage continues: "you will be surprised by the genius of its simplicity. This time Waxberger turned backwards to the past in the spirit of Israel's forefathers […] creating a most fascinating toy for you."[1] In and of itself, it is significant that the company chooses to present the Makrentz'ik as a magic lantern – an optical device with a long history dating back to the seventeenth century, which is often regarded today as an obsolete technology. Clearly, unlike the material makeup of lanterns of the past, the Makrentz'ik is a modern projection device that is made of plastic and consists of electronic components. At the same time – and contra to its promotion as a "new invention" – the Makrentz'ik's design is remarkably consistent with the lantern's initial design and optical principals.[2] Just as in the erstwhile models, the new device projects images by shining bright light behind translucent slides printed on a clear surface and focusing it with a lens fixed in front of them.[3] To what extent, then,

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1   See the company website, https://www.mwaxb.co.il/--28763 (all translations from Hebrew are mine).

2   For a history of the lantern, see Rossell 2008.

3   It is also worth noting that the cartridge upon which the Makrentz'ik slides are mounted in a circle – an element that sets the new project's design apart from the traditional slides of older lanterns – closely resembles the structure of other historical media apparatuses, namely the zoetrope and the spinning disc of the Spirograph projecting system (Huhtamo 2013a).

Fig. 11.1: The Makrentz'ik lantern and one of its slide cartridges. Author's collection.

is it accurate to call a twenty-first-century device like the Makrentz'ik a magic lantern?

Throughout their long history, magic lanterns took numerous different material configurations, appeared under several different names, and corresponded to a range of different media practices. As Charles Musser (2014) suggests, the lantern may therefore be best thought of not as a media form, but as a mutable platform for projecting images of various kinds. Over the years, lantern practitioners deployed various types of light sources and lenses and used different materials for the casing of the projector. Moreover, slides were produced and colored in a variety of techniques, as, for example, photographic slides came to eclipse the use of hand-painted glasses, and ultimately motion-picture films became part of lantern practices. In turn, the dominant use of the lantern and its cultural reach have also altered, which is manifested in a range of names that described projection devices

– from the phantasmagoria to the optical lantern and the stereopticon of the nineteenth century. The lantern thus remained an underlying term that at once carries historical connotations and also describes various devices – a characteristic which, as I shall argue below, effectively suits the association of the Makrentz'ik with an outmoded media culture.

Beyond its technical similarities to the initial form of the magic lantern, the Makrentz'ik may also be seen as belonging to a long tradition of domestic and child-oriented visual media that dates to the nineteenth century and has seen various shifts in its cultural significance and intermedial context. Discussions of toys in media-archaeological studies typically revolve around nineteenth-century manually operated devices such as the phenakistoscope and the zoetrope, which came to play an important role in the genealogy of animated pictures. Also known as "philosophical toys," such devices that produce an illusion of movement functioned simultaneously as playthings and as devices for observing and experimenting with visual and optical principles (Gunning 2012). Several variants of the lantern platform also functioned as optical toys during the same period. Not only were toy lanterns designed to be used by children, involving visual fascination as well as hands-on engagement with the apparatus, but they also functioned at the intersection of amusement and scientific demonstrations.

Toy magic lanterns have existed in Europe since the early nineteenth century and became commonplace during the 1870s, when technical developments permitted the mass production of inexpensive tin projectors and chromolithographic glass slides that were meant for home use (Bak 2015; Wells 2010; Robinson, Herbert, and Crangle 2001, 304). Although the cultural importance of public magic lantern shows gradually declined alongside the emergence of motion pictures, domestic magic lanterns were popular through the first decade of the twentieth century, often marketed as an entertaining scientific hobby for boys that involved playful experimentation with optical principles. Slides for such lanterns commonly included colorful images of landscapes, animals, or illustrations for well-known children's stories and nursery rhymes.

With the rise of affordable home film projectors and photographic cameras, the toy lantern lost some of its attractiveness. According to Meredith Bak's pioneering study, after its prominence declined in the first years of the twentieth century, "the toy lantern remained cemented in time as an object of nostalgia" (2015, 130). Nevertheless, in the following decades – and in fact up to the present – newer models of lanterns for children remained on the market and have continuously adapted their form, namely in the mid-century transition to manufacturing in plastic and the use of electrical

illumination. The Walt Disney company, for example, first licensed a British manufacturer to create toy projectors and glass slides with characters from the studio's cartoons in 1930 and, over eighty years after, launched a digital variant of the lantern where images are sent to the projector wirelessly using a designated smartphone app (Wills-Wood 1992, 8; Bak 2018, 264). Today, a rather large variety of toy lanterns is still marketed. Some models are small and simple, taking the form of handheld flashlights, while others are in more elaborate forms that in several cases – such as the Spin-Master Storytime Theatre or the Firefly projector model from Russia – share the design of the Makrentz'ik's hardware.

In the context of media archaeology, the persistence of the toy lantern presents an interesting perspective on the question of technological and cultural obsolescence. For, as David Robinson puts it, "the lantern never really died" (2005, 584). To be sure, professional magic lantern performances and lectures are no longer a vital organ of media culture, and lantern projectors from past centuries are considered today to be collector's items or objects for historical study and experimentation in media art. Around the mid-twentieth century, magic lantern projectors were used mostly in classrooms and lecture halls and have since become increasingly rare. Conversely, the smaller, simpler, and cheaper toy magic lantern still maintains a certain appeal in consumer culture, although very much on the margins of today's popular media and with a significantly transformed cultural significance. They may indeed be considered as one of the optical toys that, as Bak argues, "are not obsolete technologies displaced by newer media but are alive and well in today's playscape" (2020, 209). In the present, Bak notes, the marketing of these optical toys often attributes to them a distinct cultural significance, highlighting their advantages in fostering skills that pertain to science, technology, engineering, and math (STEM) education. As such, toy magic lanterns fit the category of "residual media," described by Charles Acland as "reconfigured, renewed, recycled, neglected, abandoned, and trashed media technologies and practices" (2007, xx).

However, the particular example of the Makrentz'ik presents us with a more complex historiographic case of media obsolescence, renewal, and transformed cultural significance. For in the Haredi community in Israel, the appeal of a toy like the Makrentz'ik does not stem from nostalgia or an antiquarian sentiment, since magic lanterns were never part of Haredi cultural history. Nor does the Makrentz'ik appear to be beneficial in developing STEM-related skills, given that most ultra-Orthodox community leaders strongly oppose the inclusion of a secular curriculum in schools. Thus, in order to shed light on the particular values and practices associated with an

artifact like the Makrentz'ik and to come to terms with how it is presented simultaneously as a novelty and as marking a return to the past, some further exploration of the Haredi cultural context is required.

Tales of Faith in Sound and Image

The Haredi community is noted for its most strict and uncompromising observance of Jewish laws and commitment to traditional practices (the word Haredi derives from the Hebrew word for "fearful," in the sense of being God-fearing). Ultra-Orthodox rabbis play a central role as Haredi spiritual leaders. Not only are they the source of religious instruction and ruling, but they also have considerable influence on many aspects of social life in their communities. Given that the Haredi world comprises various groups and religious movements and its religious leaders vary in their views on numerous social and cultural matters, it is difficult to attribute specific ideas to the community at large. Therefore, in what follows, I shall mainly refer to certain general characteristics that typify the mainstream of the community.[4]

The Haredi movement originated in late nineteenth-century Europe, primarily as a reaction to modernization and the social changes brought about by secularization. To this day, the rejection of modern values in favor of conserving a traditional lifestyle is central in the ultra-Orthodox world, which in many cases motivates a high degree of self-segregation. In Israel, where the community comprises over thirteen percent of the population, the Haredi public is mainly concentrated in homogenous towns or closed-off neighborhoods, and operates an independent ultra-Orthodox educational system with separate institutions for boys and girls. Aiming to protect their belief system from external influences, Haredi communities typically exclude exposure to mass media, which in their view is emblematic of the dangers and corruption of secular culture. As I elaborate below, recent decades saw the rise of a Haredi cinema movement. Yet, the Haredi public does not attend mainstream film screenings, and historians of Israeli cinema have documented rabbinical objections to the movies since the

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4   As Ruth Tsuria and Heidi A. Campbell note, "Within Orthodoxy, a spectrum of reactions to modernity exist. On one end of the spectrum, ultra-Orthodox groups typically reject modern values and live in more closed-off communities. However, even within ultra-Orthodox society there are different degrees of exclusion, where some ultra-Orthodox communities work and interact with the secular world while fencing themselves off from possible challenges to their belief systems" (2018, 193-194).

early 1900s (Shohat 2010, 15). In 2015 – one year before the introduction of the Makrentz'ik – only 5.3 percent of Haredi households owned a television set, and 31 percent were linked to internet, compared to 79 percent of all Israeli households. That year also, only 55 percent of Haredi households possessed at least one computer, 14 percent owned touchscreen devices, and 1.4 percent owned a videogame console (Cohen 2017, 120, 124).

Several studies from recent years have traced the complex relation of the Israeli Haredi community to the internet and cellular communication as representative of their ideological difficulties in adopting modern technologies. As communication scholar Heidi A. Campbell has demonstrated, such processes of religious groups' negotiations with new media forms involve a dynamic of "religious-social shaping of technology" (2010, 41). Campbell and other scholars have noted that ultra-Orthodox rabbis initially banned access to the web altogether, noting the potential dangers of allowing unregulated exposure to immodest content. Very quickly, however, it became clear that it was impossible to dissociate from the internet, given the extent to which many aspects of work and everyday life came to be dependent on information networks. In response, commercial internet providers devised, in consultation with prominent rabbis, services that offer filtered web access. These services permit connection only to sites that have been preapproved, based on religious criteria – while blocking others, including social media and file-sharing services (Tsuria and Campbell 2018, 197).

Likewise, scholars have shown that the emergence of the cell phone and particularly of the internet-connected smartphone posed further challenges to Haredi adaptation to life with technological media (Campbell 2007; Rosenberg and Blondheim 2021). Established in 2005, the "Rabbinical Committee for Communication Affairs," consisting of rabbis from various ultra-Orthodox groups in Israel, cited among its duties the constitution of criteria for what have become known as kosher cell phones. The committee permitted the use of phones that can function for nothing more than to make and receive voice calls. In the case of smartphones, kosher versions block access to the web as well as the standard app store, and enable only a handful of approved apps. Kosher phones are given special area codes, so that they are easily identifiable, and are visibly marked with a stamp as a means of assuring community control over appropriate media uses.

Although they concern telecommunications media, the insights offered by these studies of the Haredi reception of the internet and the cell phone are also valuable in illuminating how the Makrentz'ik corresponds to the community's particular societal and religious concerns – especially regarding young people's use of media. In fact, toys made for ultra-Orthodox

children are themselves a relatively new phenomenon. According to Laura Arnold Leibman, "In the past, Haredi communities have often rejected certain modern toys because of the secular values the toys convey" (2017, 304). In recent years, however, the communities "changed their tactics and started creating toys that reinforce rather than undermine their religious traditions and value," recognizing that toys may be "a hands-on way for young practitioners of religion to learn their religion's values" (Leibman 2017, 304). Along similar lines, artist Yoel Waxberger, the creator of the Makrentz'ik slides, declared that the goal of his work is to "glorify Judaism" by presenting Jewish materials – which are traditionally textual based – in "a colorful, live, and vibrant way," while keeping them pure and holy.[5] Yet, the introduction of audiovisual technology in a toy for Haredi children clearly involved difficulties. Here, the case of Makrentz'ik presents us with a unique complexity, as it involves not the religious-social shaping of new media as previously theorized, but rather the shaping (or reshaping) of an old, arguably outmoded medium.

The rhetoric that Waxberger uses in describing his invention merits particular attention. When addressing his approach to the slide projector, he speaks very much in the spirit of media archaeology, namely with respect to Siegfried Zielinski's call for the pursuit not of the "old in the new" but of the "new in the old" (Zielinski 2006, 3). As Waxberger says about the creation of the Makrentz'ik: "it is a simple product. I re-invented the wheel backwards, instead of inventing it forwards."[6] Waxberger emphasizes the novel aspects of his invention, while noting its traditional, low-tech nature. As he puts it, he upgraded the old-fashioned slide projectors from his kindergarten days by introducing the cylindrical slide cartridge. "The slides remain primitive, as in olden days [...] I added sound and the slides [automatically] follow one another, projected on the wall." The so-called primitive nature of the lantern is thus highly valued in the context of Haredi toys. The Makrentz'ik is presented here not as introducing a new and potentially disruptive technology to the Haredi household, but rather as a new variant of a residual medium. Haredi parents and educators are particularly concerned with the effect of toys that convey modern values – including, of course, engagement with secular scientific inquiries and technological forms of amusement, which were historically associated with the experience of the toy lantern. It is therefore particularly due to the fact that the magic

5   See Waxberger's interview on the Hidabroot website's Youtube channel, https://www.youtube.com/watch?v=lxbZSFz6aRc&ab.

6   Waxberger interview on Hidabroot website's YouTube channel.

lantern became outmoded that today the Makrentz'ik does not maintain undesirable associations with the secular media world.

Another important element in the marketing of the Makrentz'ik is a rabbinical endorsement of its aptness for the education of orthodox children. This document, something of a medium-specific kosher certificate, is an important paratext that addresses the potential owners of the toy lantern and is reproduced on the websites of several stores that sell the Makrentz'ik. The certificate was written by Rabbi Bloi of the Bnei Brak Rabbinical Court's Sanctity and Education committee and is stamped with a notice of "the approval and recommendation of rabbis and educators." The certificate states that it concerns "the device called Makrentz'ik, which tells tales of faith in sound and image (of course without films and without the need of a computer that many of the observants avoid)" and confirms that "we examined the content and the accompanying drawing and found them worthy of being in God-fearing households."[7]

The Makrentz'ik, therefore, was deemed adequate for the strictest Haredi cultural demands because the stories illustrated on its slide series concern chiefly "tales of faith." With a few exceptions – such as cartridges that showcase the Hebrew alphabet, a visit to the doctor, or physical exercise – they follow the conventions of Haredi children's literature and revolve around traditional religious tales about righteous characters that would likely be familiar to Orthodox children (Malchi 2019). The stories all feature the figure of Kopale, a young Orthodox boy who serves as the mascot for Waxberger's products for children. Notably, women are almost completely excluded from the stories, in adherence to the severe ultra-Orthodox standards of modesty. The soundtracks recorded on the Makrentz'ik cartridges include the voices of the story characters as well as of a narrator describing the events. There is frequent use of framed narrative, typically with Kopale's grandfather telling him a story. This technique makes the slide series easier to follow and, in keeping with the Orthodox educational traditions, allocates the older religious man the role of being the source of narrative meaning.

Historically, as Bak's study has shown, toy lanterns offered not only a spectacle, but also an opportunity for children to act as showmen, curators, or exhibitors, putting up shows that potentially combined slides from different sets (Bak 2015, 113). The Makrentz'ik restricts such possibilities. It is designed to allow users to turn off the soundtrack and narrate the stories themselves, but the fixed linear structure of the slide series leaves little room

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7   A copy of the certificate is posted on the Waxberger website. See https://www.mwaxb.co.il/media/catalog/product/cache/1/thumbnail/9df78eab33525d08d6e5fb8d27136e95/f/i/file_11_10.jpg.

for innovative experimentation. To borrow a set of terms evoked by Wanda Strauven (2021) and by Nicolas Dulac and André Gaudreault (2006) in their discussion of optical toys, I would argue that the Makrentz'ik favors the "viewer mode of attraction" over the "player mode," by situating its user in the position of a spectator with a diminished hands-on engagement. A less playful toy than the historical domestic lantern, the Makrentz'ik is suitable for the demands of Haredi rabbinical scrutiny in the way it prohibits major divergence from the intended concepts it was designed to present.

Yet, as the certification from the Sanctity and Education committee acknowledges, the rabbinical authority that gave the Makrentz'ik a stamp of approval was also mindful of its material features. A great importance is attributed in the certificate to what the toy lantern is *not*: namely, that it is "without films and without the need of a computer." The reference to the computer is readily understandable. In light of the Haredi world's previous encounters with the internet and the cell phone, it is possible to assume that, in the phrase "without the need of a computer," the committee is affirming that the Makrentz'ik is not internet-connected and therefore not objectionable like other devices that may offer access to audiovisual materials that do not suit the community's standards.[8] The reference to film is somewhat less obvious, as it implies that, in the committee's view, the presence of moving images would be less tolerable than still images for the purposes of amusing and educating children – regardless of the nature of the images or the narratives they convey. Resorting to the well-worn phrase seems appropriate here: for the rabbis, the chief concern was the medium, not just the message.

From the Lantern Image to the Motion Picture (Again)

A brief detour through two other examples from the history of Haredi visual media is valuable in order to come to terms with the significance of the projected still image. The first example concerns another children's toy, and the other the emergence of a Haredi cinema industry that caters exclusively to ultra-Orthodox viewers.

A few years after the introduction of the Makrentz'ik, Waxberger started marketing another, more technologically advanced toy under the brand name Otzartzik (a Hebrew diminutive for "treasure"). The Otzartzik is a

8   In the cylindrical cartridges of the Makrentz'ik, the soundtrack is recorded on an electronic card, probably a PROM (programmable read-only memory) device, which does not require an interactive interface and is not changeable with the aid of the lantern itself.

tablet device that, like its predecessor, displays stories in images and sounds, and in addition allows the user to create picture albums and to sing along to a prerecorded playback with an external microphone. Although the Otzartzik has also been granted a rabbinical certification, several groups of Haredi community leaders have spoken out against it. For example, the "Rabbinical Committee for Computers" posted a public letter addressing parents of students in ultra-Orthodox schools in Israel, stating that the new toy – like all other touchscreen devices – should be banned. Another letter, signed by rabbis of the Haredi community, described "a new hindrance in the form of advertising and marketing tablet computers for children that arouses the interest of schoolchildren and can make them addicted to such devices from which they are instructed to keep clear" (Shefer 2019).

Like the toy lantern, the Otzartzik tablet is not internet-connected, and the audiovisual content provided for it is strictly of a religious nature. But, as the letters indicate, it is the toy's touchscreen interface that provoked controversy in the Haredi world. The Otzartzik was seen as something of a gateway-gadget. The rabbinical concern was that it would attract and habituate young children to the use of cell phones and tablets – thereby introducing the risk of exposure to materials deemed inappropriate. It is, to be sure, a rather technological-deterministic view, though it transpires that the Haredi authorities indeed evaluate the use and impact of media in such terms. The Makrentz'ik, by virtue of being a projection device, evaded such scrutiny. Not equipped with a touchscreen interface like the prohibited secular modern media technologies, the lantern represents for the Haredi public a safe alternative, a form of visual entertainment that does not require hand-held digital devices, television sets, or computer monitors, and as such maintains an Orthodox visual culture distinct from its surrounding mediascape.

In similar fashion, the fact that the toy lantern projects still images made its acceptance in the Haredi world less problematic. As mentioned above, for many decades the rabbinical authorities considered moving-image entertainment a threat to ultra-Orthodox values and lifestyle. Haredi cinema – one that is made by ultra-Orthodox artists for ultra-Orthodox audiences – is thus a recent phenomenon. It was established only at the turn of the twenty-first century, against the backdrop of the longstanding rabbinical objection, as a cultural practice produced and viewed exclusively by women, due to the fact that ultra-Orthodox men are expected to spend most of their days in religious studies.[9] Recent studies of Haredi cinema consider its pioneers

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9   The male counterpart of the women's Haredi films is based on motion pictures distributed on CD-ROMs and DVDs for home viewing. See Vinig 2021 and Aharoni 2021.

to be a group of Haredi women, among them schoolteachers and theater producers, who in the 1990s started creating sets of photographic slides documenting stage plays they directed, adding titles and an accompaniment of recorded soundtrack, to create slideshows that often ran for over two hours. The screenings of these slides took place in classrooms and public halls and quickly gained widespread popularity among Haredi women. Even though cinema was still considered taboo, rabbinical authorities permitted the directors to screen their slide shows because they saw the series of still images merely as documentations of stage performances and not as a cultural practice that shares cinema's secular values and aesthetics (Vinig 2021, 45, 62-63).

The success of the Haredi slide shows became a crucial predecessor to the rise of Haredi filmmaking. By the early 2000s, rabbis started recognizing changes in the community's cultural needs in the fast-changing media environment, and permitted public screenings of motion pictures, as long as they modeled their production practices after those of the slide shows (Vinig 2021, 64). Nevertheless, even in its moving-image forms, the Haredi creators avoided calling their works "films" or "cinema." Holding on to a vocabulary that does not overlap with the secular cultural practices, they preferred terms such as "audiovisual presentation," "display," "program," or "projection" (Aharoni 2021, 121), thereby demonstrating a difficulty in acknowledging that the Haredi works and mainstream motion pictures in fact share the same medium. (Interestingly, the promotional discourse of the Makrentz'ik is similarly inconsistent in its use of media terms, as it refers to the image cartridges interchangeably as "cassettes," "discs," and "slides.") In sum, the emergence of Haredi films has been conditioned by a careful negotiation of its distinctions from the dominant forms of cinema – aesthetically, ideologically, and technically. In this context, the Haredi slide shows provided something of a late twentieth-century "pre-cinematic" practice that gave rise to the culturally specific form of motion pictures. Yet it has not been "pre-cinematic" in the teleological and technical sense we commonly read about in traditional historiographies of film. Rather, these public projections of still images provided a crucial prototype for the ideological and cultural acceptance of motion pictures in the Haredi context precisely because they could be viewed as compatible with the Haredi anti-modern worldview. Similarly, therefore, we may conclude that modeling the Makrentz'ik after an antiquated technology allowed it to be accepted as a tolerable answer to today's challenges of new media ubiquity.

Conclusion

In their study of the use of telecommunication technologies in Haredi communities, Hananel Rosenberg and Menahem Blondheim note that "The Haredi case can offer unique insights from an unconventional perspective, on perceptions, notions, and practices of media in mainstream society that are taken-for-granted" (2021, 1). Their observation strikes me as also true with respect to studies of visual media and their multifaceted histories. As this chapter has demonstrated, the case of the Makrentz'ik troubles conceptions of linear media-historical trajectories and of temporal categories of early/late and before/after. A media archaeology of the toy lantern allows us to trace historically changing technological and discursive conditions that enable the rise of multiple dissimilar media forms and practices. By stating this, I allude not only to the fact that the lantern has continued to exist as an obsolete (or rather residual) medium long after the appearance of cinema. More compellingly, the Makrentz'ik throws into relief a media history rich with continuities, ruptures, and cyclical recurrences in technological schemes, cultural practices, and surrounding discourses.

Beyond calling attention to the fact that old media were new and that old media could be renewed, the case of the Makrentz'ik demonstrates that the very notion of modern media technology is variable and open to different interpretations in the context of different media cultures. For the nineteenth-century practitioners of religious educational lantern shows, the magic lantern was a predominantly modern technology. But its appeal to the Jewish ultra-Orthodox community today lies precisely in the fact that it can be regarded as a pre- or anti-modern medium – not only because it is supposedly "old," but because it can now be identified with the pre-modern past "in the spirit of Israel's forefathers." The Makrentz'ik is a media device initially designed to emulate a historical apparatus, yet it creates its own cultural meaning precisely by being distinct from its present surrounding mediascape. It is not merely a nostalgic return, since the lantern was not a part of Haredi cultural life before; it is instead a recreation of an outmoded media form as an alternative to contemporary media. This lantern does not anticipate the coming of cinema; rather, it aims to find a place within a distinct social context where cinema has not played a central cultural role, but the influence of networked digital media is no longer avoidable.

The study of the Makrentz'ik's history also highlights how media archaeology can benefit from reconsidering the very basic term "media culture," which has been one of its core interests. While it is recognized that media culture is dynamic and does not operate monolithically in different times

and places, it came to signify "a cultural condition, where large numbers of people live under the constant influence of media [...] an ever-changing zone of discursive exchanges [... and] a shared state of mind" (Huhtamo 2013b, 364). Recent studies in media archeology have put a much-needed emphasis on how media cultures follow distinct logics and conditions in areas that media historiography typically neglected, namely in the Global South (Blaylock 2021; Sengupta 2021). The history of how the magic lantern has come to assume a new meaning and cultural role in the Haredi world reminds us also that beyond being mindful of temporal and geographical divisions among media cultures, archaeological studies can derive new insights from explorations of how media practices vary on the local and communal level, where technological media play distinct roles in groups' social and religious life.

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PART V

Filmic Techniques

12. Theories of the Frame and Framing in Cinema: A Genealogy

Ariel Rogers

Abstract

Proposing that we conceptualize the cinematic frame in terms of the processes it enacts rather than its formal or material properties, this chapter explores how an expansive notion of framing as a process of organization and delimitation can be traced across the history of film theory. The chapter maps the ways in which a range of prominent conceptualizations of cinematic organization and delimitation have taken shape within diverse social, historical, and cinematic contexts and in dialogue with a broader interdisciplinary discourse on frames and framing. Such mapping reveals various ways in which formal and material modes of cinematic organization and delimitation have long been imbricated with psychic and social forms of organization and delimitation.

Keywords: frame, framing, cinema, film theory, immersion

The notion of the frame is central to the analysis as well as the making of cinema, underlying accounts of films' formal organization and, with it, their modes of representation and address. Within this discourse, the frame tends to be conceptualized as the rectangular surrounding structure that organizes and delimits the cinematic image. This conceptualization brings together and aligns the frames of the camera, the filmstrip, and the screen, which are understood to function through what Anne Friedberg describes as a "relay of frames," wherein "the framed view of the camera becomes a framed image seen by an observer" (2006, 80). This notion of the cinematic frame owes much to discourses on visual art and theater, which likewise grapple with the ways in which picture frames and proscenium arches organize and delimit views. An emphasis on the rectangular surrounding structure associated with the frame, which allies picture frames, proscenia,

and screens, also informs descriptions of the cinematic image via the familiar metaphors of the picture frame, window, and mirror. Rooting our notion of the cinematic frame in the formal and material properties of such objects, however, raises problems when we confront technological changes. Formats and platforms that transgress or eliminate the rectangular window-like view, from 3D cinema to virtual reality, are usually thereby also assumed to trouble or abolish the frame – even though, as Mary Ann Doane has pointed out in an important rejoinder to the scholarly celebration of "immersive" media, this assumption exists in tension with the fact that the frame is, as Jacques Derrida and others have made clear, the very "condition of possibility of representation" (Doane 2021, 249; Derrida 1987).

The confusion, I would suggest, results from thinking of the cinematic frame primarily in terms of the technological apparatus, understood vis-à-vis the formal and material properties of components such as filmstrips and screens. As much a function of technique as it is of technology, the cinematic frame remains in operation – even when the apparatus changes shape – as long as cinema serves as a form of representation. As Gerald Mast contended decades ago, the cinematic frame should be considered not as a physical object like a container but rather as a process – something, in other words, that enacts framing. Focusing specifically on the operation of the frame within film texts, Mast claims that the cinematic frame "is analogous to *vision* itself in both possible senses of the term (as physical sight and as mental insight)" (1984, 85; emphasis in original). But recognizing with Friedberg how framing functions across the domains of production, representation, and exhibition encourages a more expansive understanding of what this process entails. As I have argued elsewhere, an interdisciplinary body of thought on framing across the twentieth century – from Henri Bergson, Edmund Husserl, and Martin Heidegger; to Frantz Fanon and Jacques Lacan; to Gregory Bateson and Erving Goffman; to Jacques Derrida, Gilles Deleuze, and Louis Marin – supplies such an expansive understanding (Rogers 2023). This body of thought portrays framing not simply as the organization and delimitation of a view, but rather as a process of organization and delimitation more generally. Often drawing on ideas about the picture frame, this discourse reveals how the notion of framing can also illuminate the organization of perception, subjectivity, and social experience. Indeed, it insists that formal and material framing practices are bound up with social, psychic, and discursive forms of framing. This body of work, moreover, has long informed theoretical writing on the cinematic frame, yielding insights on the process of cinematic framing that, while often taking for granted a rectangular screen, are not dependent on its formal or material properties.

Considering the cinematic frame not as the container of a view but rather as a process of organization and delimitation – something that performs framing, understood capaciously – illuminates a remarkable variety of ideas about the nature and function of cinematic organization and delimitation across the history of film theory. This chapter maps some prominent instantiations of these ideas, particularly as they have emerged in Europe and North America, by contextualizing them within social, intellectual, and cinematic histories, and placing them into dialogue with one another. In doing so, I put some of the most canonical writing on cinema into conversation with recent efforts to think through how attention to racial difference might transform fundamental concepts. Among other things, this conversation underscores the social and political stakes of framing and thus also highlights the critical insight we stand to gain in recognizing how purportedly immersive media continue to participate in this process.

For the sake of clarity, I have presented these discourses roughly chronologically and grouped them through conventional designations (such as classical film theories) and periodizations (with section breaks before and after 1970s film theory). However, parsing the ways in which notions of cinematic organization and delimitation weave through these discussions reveals important ruptures and returns as well as continuities, and should dispel any suspicion that conceptions of the cinematic frame and framing have evolved teleologically. In mapping and contextualizing the emergence of these ideas, my chapter undertakes a genealogy of theories of the frame and framing in cinema, borrowing from Michel Foucault's call for genealogy to "record the singularity of events outside of any monotonous finality," in part by isolating "the different scenes where they engaged in different roles" (1977a, 139, 140).[1] Although the genealogy presented here is by necessity partial and brief, it offers a sense of the shifting ways in which the techniques and technologies of cinematic framing have been conceptualized in relation to ideas about psychic and social forms of organization and delimitation.

The Frame and Framing in Classical Film Theories

Early film theorists who focused on cinema's medium specificity, such as Hugo Münsterberg and Rudolf Arnheim, identified the frame as a key means of cinematic organization, something that distinguishes the image from the surrounding world and endows it with the internal coherence

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1   On a genealogical approach to media history, see Buckley, Campe, and Casetti 2019.

attributed to works of art. In doing so, these theorists echoed Georg Simmel's 1902 assertion that the frame both symbolizes and strengthens the "double function" of an artwork's boundaries, which constitute "that absolute ending which exercises indifference towards and defence against the exterior and a unifying integration with respect to the interior in a single act" (Simmel 1994, 11; emphasis removed). In his 1916 treatise *The Photoplay: A Psychological Study*, for instance, Münsterberg contends that the "formal arrangement" of the mise en scène simulates the mental act of attention by "[pointing] toward" an object of interest, while the process of selection epitomized by close framing simultaneously banishes "everything which our mind wants to disregard" from sight and makes it disappear (2002, 84, 87). He thus identifies cinematic framing as an important means by which films overcome the physical constraints of material reality by simulating psychological processes, thereby in his view functioning as works of art. Also trained in psychology, Arnheim like Münsterberg emphasized the relationship between artistic organization and the organization of perception. Arnheim, however, drew on Gestalt psychology's contention that processes of vision "organize the sensory raw material creatively according to principles of simplicity, regularity, and balance" in order to champion artworks that display similar forms of organization (1957, 3).

For Sergei Eisenstein, writing in the 1920s-1940s, framing collaborates with montage to create spatiotemporal forms of organization – the collisions within and between shots that Eisenstein termed "mise en cadre" – that establish the significance and effect of a film as a whole (Eisenstein 1949, 16). Thus, for instance, in his 1929 essay, "The Cinematographic Principle and the Ideogram," he described framing as "organization by means of the camera," identifying "the conflict between the frame of the shot and the object" as "one of the most fascinating of optical conflicts" (Eisenstein 1949, 41, 40). That same year he declared that conflict "*within a thesis* (an abstract idea) – *formulates* itself in the dialectics of the sub-title – *forms* itself spatially in the conflict within the shot – and *explodes* with increasing intensity in montage-conflict among the separate shots." It was a process that, in a move not unlike Münsterberg's and Arnheim's, he identified as "fully analogous to human, psychological expression" (Eisenstein 1949, 53; emphases in original). For Eisenstein, though, this form of composition is based in conflict rather than focus or balance, and it does not distinguish cinema from nature. An instantiation of Marxian dialectics, such composition endows cinema with a form of unity that Eisenstein considers organic. It works to establish meaning in part through what he calls the "encounter" between an object and its framing within the shot, an encounter that works

to transfer meaning from the realm of character and action to the graphic dimension. That encounter collaborates with the dynamics supplied by montage to render mise en cadre what he calls "*mise en scène* at a higher stage of development" (Eisenstein 1988-1996, 2: 15, 20, 21).

Whereas Simmel conveyed the neo-Kantian assumption that the frame works to distinguish the work from its milieu, Eisenstein followed his mentor Vsevolod Meyerhold in seeking to render porous the boundary between the work and spectator. In doing so, Eisenstein embraced a notion of spectator effect (and affect) based in the performance style that Meyerhold dubbed "biomechanics," which drew from commedia dell'arte and circus as well as Taylorism and neurophysiological and reflex psychology (Law and Gordon 1996, 34-37; Posner 2023). In Miriam Hansen's words, Eisenstein harnessed this set of ideas in order "to theorize the conditions of transmitting or, more precisely, producing emotion in the beholder through bodily movement," a prospect that would also inform Walter Benjamin's concept of innervation and that Eisenstein extended to the structure of the work itself (1999a, 317). Describing the method of montage in 1938, for instance, he claimed that the "image planned by author, director and actor is concretized by them in separate representational elements, and is assembled – again and finally – in the spectator's perception" (Eisenstein 1942, 31). Eisenstein presented this as "the final aim of every artist's creative endeavor" (1942, 31).

Eisenstein thus advocated for what he identified as a kind of frame-breaking in cinema's address (2013, 39). (Bertolt Brecht's conception of epic theater, which borrowed from Eisenstein, shared the emphasis on such frame-breaking but shifted its goal from affective and intellectual proximity to distanciation.) It is important to highlight, though, that such ostensible frame-breaking does not actually eliminate the frame. As mentioned, the frame played a crucial role in Eisenstein's filmmaking and film theory as a means of compositional organization and therefore also as a means of affecting the viewer. Moreover, in developing his ideas about audience engagement through his early theater practice, Eisenstein had experimented heavily with framing devices and frames within the frame. It was a strategy that he shared with Meyerhold, who, as Dassia Posner argues, aimed not to bare the device or achieve estrangement, but rather to treat the frame as "a liminal space in which meaning can be generated by actors and audiences alike" (2016, 63, 132-193). In this, Eisenstein and Meyerhold employed a strategy also seen in Baroque art, which, in Arnaud Maillet's words, "opened passageways between the space of the spectator and that of the work" precisely by redoubling and exceeding the frame (2004, 182). Rather than erasing the frame, these approaches to frame-breaking display a particular

attitude toward how the frame mediates what is inside and what is outside the work, reconceiving its boundary as a means of transmission rather than insulation.

Another prominent figure in classical film theory, André Bazin, also treated the frame as porous, though he conceptualized the nature and effect of that porosity differently. Often distinguished from reputed formalists such as Münsterberg, Arnheim, and Eisenstein, Bazin has tended to be considered a "realist" who treats the film screen as a window opening onto a world rather than as a picture frame organizing an image – or as a mirror providing an ideologically loaded reflection, as apparatus theorists have been understood to do (Andrew 1984, 134; Sobchack 1992, 14-17). As the cases of Münsterberg, Arnheim, and Eisenstein have already suggested, however, attending to conceptions of the frame across this body of work complicates such neat categorizations. Writing in the wake of the Second World War and specifically his experience of occupied France, Bazin was suspicious of the propagandistic possibilities of cinema that Eisenstein, writing in the very different context of the early Soviet Union, had celebrated, a suspicion that Bazin shared with fellow "realist" Siegfried Kracauer, who wrote during and after his own harrowing escape from Nazi Germany via France. In the historical context that gave rise to cinematic neorealisms and subsequent new-wave movements – and that had, importantly for both Bazin and Kracauer, seen the use of film to document the Nazi death camps – Bazin and Kracauer each argued strenuously against approaches to cinema that emphasized organized messages. They advocated instead for embracing cinema's capacity to reveal the ambiguity of reality, though they did so in distinct ways and in dialogue with separate intellectual traditions (Andrew 1978; Hansen 1997; Andrew and Joubert-Laurencin 2011).

Although Bazin in particular would be pegged as a "naive realist" by the 1970s film theorists interested in identifying and critiquing the ideological dimensions of film form, subsequent scholarship has made it clear that this dismissal rested on significant misrepresentations of Bazin's work. Already in 1978, Dudley Andrew emphasized that Bazin did not naively envision reality as "some self-sufficient sphere which we approach now from one side, now from another, striving to penetrate and use it" (1978, 106). Rather, Bazin drew on the intellectual culture surrounding him, including the thinking of Jean-Paul Sartre and Maurice Merleau-Ponty, envisioning reality as "an 'emerging-something' which the mind essentially participates in and which can be said to exist only in experience" (Andrew 1978, 106). Attention to Bazin's notion of framing bears this out, clarifying that, despite his use of the metaphor of the window, Bazin does not simply assume the transparency

of the film screen, but rather proffers an alternative way of conceptualizing the kind of mediation its boundaries accomplish. If Eisenstein conceives of the frame as a vehicle of transmission between the work and the audience, Bazin presents it as a means of indexing – and thereby offering viewers an encounter with – a reality outside of and incapable of being encompassed by representation. In this way, Bazin's account of the frame draws on his engagement with Bergson, in addition to figures like Sartre and Merleau-Ponty, and thereby also anticipates Deleuze. As Andrew has more recently observed, Deleuze joined Serge Daney in recognizing Bazin's "affinity with a philosophy of the virtual," helping to make it clear that, in Andrew's words, Bazin "is at least in great part a theorist of absence for whom the clear Sartrean categories of presence and absence give way to intermediate concepts with names like 'trace,' 'fissure,' and 'deferral'" (2010, 8, 9).

Bazin contrasts the boundaries of the film screen with the boundaries found in painting and theater. Drawing on José Ortega y Gasset's argument that the picture frame serves to isolate the work of art from the wall, and from the real world more expansively, Bazin contends that with painting the picture frame "offers a space the orientation of which is inwards, a contemplative area opening solely onto the interior of the painting" (Bazin 1967, 166; Ortega y Gasset 1990, 188-189). He describes theater similarly: "The stage and the decor where the action unfolds constitute an aesthetic microcosm inserted perforce into the universe but essentially distinct from the Nature which surrounds it" (Bazin 1967, 105). Rather than apply such ideas to cinema in the effort to identify it as a form of art, as Münsterberg and Arnheim had done, Bazin conceptualizes cinema in opposition to these notions of painting and theater. He makes the repeated claim that the film screen is not like a picture frame or stage but rather like a mask or piece of masking, and that its spatial organization is centrifugal rather than centripetal. For instance, he contends that the "screen is not a frame like that of a picture but a mask which allows only a part of the action to be seen. When a character moves off screen, we accept the fact that he is out of sight, but he continues to exist in his own capacity at some other place in the decor which is hidden from us" (Bazin 1967, 105).

This contention might seem to support allegations of "naive realism," but Bazin's continuation of the point indicates that he understands that film is a construction: "There are no wings to the screen. There could not be without destroying its specific illusion, which is to make of a revolver or of a face the very center of the universe" (1967, 105). In other words, Bazin is not suggesting that characters actually continue to go about their business when they move offscreen, but instead that the screen's operation as a mask

enables cinema to proffer a different kind of spatiality, one in which what is onscreen points outward toward an amorphous outside. This is made clear when Bazin goes on to describe cinema as "the little flashlight of the usher, moving like an uncertain comet across the night of our waking dream, the diffuse space without shape or frontiers that surrounds the screen" (1967, 107). This notion of the screen-as-mask portrays the frame line not as a vehicle for presenting onscreen imagery as real, but rather as a mode of limitation that establishes the significance of what is shown in relation to a more expansive domain that it indexes but cannot represent. In these ways, Bazin's notion of cinematic boundaries approximates the delimiting function that Bergson – and, drawing on him, Deleuze – attribute to perception as a subtraction from the aggregate of images that constitutes the material world (Bergson 1991, 18, 22, 34-38; Deleuze 1986, 61-66). Whereas Eisenstein views the cinematic frame's porosity as a means by which films establish contact with the viewer, enabling the spaces of representation and spectatorship to communicate, Bazin portrays such porosity in terms of films' communication with a different kind of outside – a notion of reality that is outside to the spectator as well.

The Frame and Framing in 1970s Film Theory

The approaches to the frame taken up by European and North American film theory in the 1970s conceived its operations of organization and delimitation in a different way again. Here importance was returned to the organization of the frame, and that organization was once more understood to shape spectatorship (with Bazin frequently serving as a foil to exemplify the naive belief that film could reveal an empirical reality). But if Eisenstein celebrated the propagandistic power of cinematic organization and its effect on the viewer, these phenomena were now – in the wake of the social and political upheavals of the 1960s, especially the May 1968 protests in France, and in dialogue with experimental and politically committed filmmaking – roundly critiqued as ideological. The brand of film theory that emerged in the late 1960s and flourished in the 1970s, gracing the pages of journals such as *Cahiers du Cinéma, Cinéthique,* and *Screen*, evinced an interest in analyzing cinema as a textual system. In doing so, it took inspiration from evolving dialogues among semiotics, deconstruction, psychoanalysis, and Marxist theory, drawing on the work of thinkers such as Ferdinand de Saussure, Lacan, Derrida, Louis Althusser, Julia Kristeva, and Roland Barthes (who also contributed to the writing on film), as well as

on Marxist practitioner-theorists who had worked in the 1920s-1930s, such as Eisenstein, Dziga Vertov, and (especially) Brecht, and, to a lesser extent, the older tradition of Russian Formalism. This body of work was of course not homogeneous. Particularly as the discourse unfolded in *Screen*, there was a split between those scholars focused on exploring cinematic codes (including those drawing on Russian Formalism, such as David Bordwell and Kristin Thompson) and the larger contingent of theorists interested in examining cinema's relation to ideology, especially through its establishment of subject positions – an approach that D.N. Rodowick, drawing on Sylvia Harvey, has discussed under the banner of "political modernism" (Rodowick 1988, iv, 1; Baumbach 2019, 38). In both camps there was an effort, in line with post-structuralist currents, to examine the places where cinematic systems escaped systematicity, revealing heterogeneity, contradiction, and/or excess. But whereas Bordwell and Thompson read such excesses as an opportunity for "perceptual play," theorists such as Barthes and Stephen Heath saw them as forces for political change (Thompson 1986, 133; Thompson and Bordwell 1976, 73; Barthes 1973, 49; Heath 1986, 410-412; Rosen 1986, 11-13; Watts 2016, 49-60).

One aim of this discourse was to detail the workings of mainstream (especially Hollywood) cinema, which was labeled "classical" by virtue of its purported adherence to norms of transparency and linear narrative (Hansen 1999b, 63; *Cahiers du Cinéma* editors 1986, 445). This so-called "classical" cinema was often considered ideological by virtue of this transparency, though writers such as Jean-Louis Baudry and Christian Metz also attributed an ideological functioning to the cinematic apparatus in its own right. At the same time, many theorists working in this mode advocated for a politically progressive experimental "counter-cinema" that would disrupt the ideological work of "classical" cinema, especially by disrupting the effect of transparency (Comolli and Narboni 1971; Wollen 1986). It should be emphasized that, in this context, ideology was discussed initially in terms of capitalism and eventually, thanks to the engagement with psychoanalysis, in terms of patriarchy also. This work emerged toward the end of a major period of decolonization and was contemporaneous with the ongoing struggle against neocolonialism across the Global South. It was also contemporaneous with the rise in Latin America of discourses and practices in Third Cinema, which shared the interest in experimenting with form to challenge cinemas that were deemed ideological but drew on critiques of colonialism from thinkers such as Fanon and challenged international art cinema as well as "classical" Hollywood (Solanas and Getino 1970-1971; Espinosa 1979; Pines and Willemen 1989). By contrast, the writing usually associated with 1970s

film theory did not by and large explore the colonialist dimensions of either "classical" cinema's or art cinema's ideological projects.

Alongside editing, framing contributed significantly to the way this discourse analyzed how cinematic texts worked to represent space, especially via what Noël Burch identified as filmmakers' handling of the "fluctuating existence" of offscreen space (Burch 1981, 21; emphasis removed). Framing thereby also informed the way theorists working in this milieu read films' relationship to ideology. The use in "classical" cinema of compositional techniques such as centering was, together with the employment of continuity editing, seen to play a crucial role in endowing its mode of representation with a false spatiotemporal unity that supported its transparency. Moreover, insofar as the camera's optical mechanisms were associated with Renaissance perspective, understood not only as a form of representation but also as a technique that established an ideal spectatorial position, its frame was also taken (in collaboration, again, with editing) to designate a falsely coherent subject position that was at once spatial, psychic, and social, a reading that reflected Lacan's own invocation of Renaissance perspective in describing the establishment of the Cartesian subject (Lacan 1977, 86-87). In this context, films that disrupted such unity and coherence – revealing the heterogeneity, contradiction, and/or excess mentioned above – were often viewed as politically progressive, particularly insofar as they were believed to distance the viewer and reveal social machinations in line with Brechtian practice.

Framing was understood to negotiate unity and heterogeneity through the ways in which it both organized the image and designated its outsides. We can see a focus on the organization of the image in, for instance, debates over the excessive mise en scène of 1950s family melodramas – especially as associated with the Hollywood output of Douglas Sirk – where the films' approach to framing contributed to a general aesthetic stylization that was understood to distill social tensions and manifest ideological contradictions (Willemen 1971, 1972; Elsaesser 1972; Mulvey 1977-1978). By contrast, theorists such as Baudry and Heath examined how unity within the frame obscures the heterogeneity outside its borders. Heath in particular built on Burch's account of cinema's spatial construction but critiqued the way in which Burch and others who were focused primarily on cinema's textual codes failed to question these codes' activity "outside of formal limits." Heath called instead for a "politically consequent materialism in film" that works "on the constructions and relations of meaning and subject in a specific signifying practice in given sociohistorical situation," particularly by attending to the "operations of narrativization" (1986, 409, 411-412). In pursuing such a project,

Heath thus also drew on Baudry's ideas about cinematic subject positioning to contend that, in "classical" cinema, the centering and fixity provided by framing, together with the continuity afforded by editing and the coherence supplied by narrative, function to create a fiction of unity for the spectator. Importantly for Heath, the work of framing, like that of "classical" editing and narrative, is not only to endow film with structure and meaning but also to continually counter an excess – to recapture the outside that exceeds the frame but that the frame simultaneously "delimits and poses" – a process that occurs through the way in which "classical" films negotiate onscreen and offscreen space (Heath 1986, 403). Through such work, he contends, "classical" cinema obscures not its mode of production, as Baudry argues, but rather the terms of that production's unity, what Heath describes as "the other scene of its vision of the subject, the outside – heterogeneity, contradiction, history – of its coherent address" (1986, 404). Heath offers Nagisa Oshima's DEATH BY HANGING (1968) as a film that refuses such a coherent address by using narrative form to present "the absence of another film the discourse of which, punctuating this film and its space, finds its determinations, its contradictions, its negativity" (1986, 412).

Both Baudry and Heath thus take the frame as deployed in "classical" cinema to provide a kind of false hermeticism. This frame offers a form of organization that is meaningful in that it proffers a subject position cut to the measure of ideology. As with Eisenstein, the suggestion is that this form of organization imposes itself on the spectator's understanding and experience. But, in line with contemporaneous post-structuralist thinking, Baudry and Heath insist that such organization exists only in relation to what is outside of it. And they conceptualize this outside not as an actual audience or an ambiguous reality, but rather as the setting for the making of meaning and, with it, the institution of ideology. Notably, however, Baudry and Heath diverge as to how exactly they conceptualize that setting. And they thus also differ regarding what they think the frame of "classical" cinema hides, and that of oppositional cinema reveals. For Baudry, drawing on Althusser, the repression carried out by "classical" cinema is "primarily economic": this cinema represses – and oppositional cinema unveils – film's mode of production, including its material apparatus, and the forms of work it performs (Baudry 1986, 296). By contrast, Heath draws on Kristeva's notion of negativity, which Kristeva conceptualizes as a means to "establish the heterogeneous logic of signifying practices, and locate them, finally and by way of their subject, in the historically determined relations of production," and which she thus also presents as something "which rends and renews the social code" (1986, 32, 33). Echoing what Kristeva identifies

as her own departure from the way in which "mechanistic Marxists" reduce negativity to "a merely economic externality," Heath diverges from Baudry by suggesting that what the centered framing, continuity editing, and unified narration of "classical" cinema contain through the negotiation of onscreen and offscreen space – and what oppositional cinema points toward – is not cinema's economic foundation but rather the possibility of an alternative organization of subjectivity (Kristeva 1986, 31; Rodowick 1988, xvii-xx, 180-220).

The Frame and Framing in Film Theories since the 1980s

Gilles Deleuze's two books on cinema, first published in 1983 and 1985, are usually treated as a dramatic departure from 1970s film theory. Not only do these books (in line with Deleuze's larger body of work) depart from Saussurian semiotics and Lacanian psychoanalysis, but they also diverge from 1970s film theory's focus on theorizing spectatorship in favor of exploring cinema as a mode of thought. In this, they continue Deleuze's longstanding commitment to withdrawing "allegiance from the old categories of the Negative (law, limit, castration, lack, lacuna)," in Foucault's words, and preferring instead "what is positive and multiple, difference over uniformity, flows over unities, mobile arrangements over systems" (Foucault 1977b, xiii). As Nico Baumbach argues, however, Deleuze's books on cinema "should not be perceived as an absolute rejection of seventies film theory, but, on the contrary, can help us return to what was most valuable in it" (2019, 77). They do so by not only revealing the relationship between form and affect, but also thereby offering a means of conceptualizing cinema as political. As Baumbach puts it, Deleuze envisages cinema as an art form and thus as something that "is affirmative and creative but also 'in between,' which means that it is a form of resistance": as a creative act it responds "to dominant forms of power" without being "merely reactive" (Baumbach 2019, 90-91; see also Rodowick 1997, 196-198).

Deleuze's account of the cinematic frame illustrates these tensions, replacing 1970s film theory's focus on what we could, in Deleuzian language, call the frame's territorializing function, with an emphasis on its capacity for deterritorialization. In observing, for instance, that "the screen, as the frame of frames, gives a common standard of measurement to things which do not have one – long shots of countryside and close-ups of the face, an astronomical system and a single drop of water – parts which do not have the same denominator of distance, relief, or light," Deleuze does not suggest that

this "common standard of measurement" provides a unified or apparently transcendental subject position, as Baudry likely would. Instead he looks to the incommensurability among the images to conclude that in "all these senses the frame ensures a deterritorialization of the image" (Deleuze 1986, 14-15). Deleuze further emphasizes this deterritorializing function in conceptualizing the frame not simply as a container for cinematic space, but also as a boundary demarcating the actual and the virtual. He contends that, with the movement-image associated with "classical"-era cinema, the film frame does not simply delimit a space and negate a space; it simultaneously determines an "out-of-field" that testifies to a "radical Elsewhere, outside homogeneous space and time," which he conceptualizes as the "whole into which [the frame] is integrated" (Deleuze 1986, 17, 18; see also Peretz 2017).

With the time-image, which is associated with but not limited to post-"classical" cinema, framing delimits the outside rather than the open as a formation of the whole, and the out-of-field is replaced by the interstice between framings. While the open designates a Bergsonian notion of time as duration, the outside is a concept that Deleuze adapts from Maurice Blanchot, especially as read by Foucault, to describe the present as an opening that makes the indiscernible visible and thus enables the emergence of new forms of thought and subjectivity. Deleuze contends that the time-image presents this temporality directly through its activation of irrational intervals between images, between sounds, and between images and sounds (Deleuze 1989; Rodowick 1997; Ropars-Wuilleumier 2010). Despite Deleuze's many departures from 1970s film theory, he thus shares with Heath the idea that the interstices between framings may open up a space for the emergence of new forms of subjectivity (though Deleuze's notion of subjectivity diverges from the psychoanalytic lineage informing Heath's, reflecting the divergence between Foucault and Kristeva). He also shares the fundamental suggestion that this possibility simultaneously opens up cinema's political potential.

Film scholarship in the 1980s and 1990s pushed back against 1970s film theory in several other ways, indicting especially its underestimation of the spectator and inadequacy in accounting for social and cultural difference. While psychoanalytic and semiotic theory continued to inform analyses attuned to race and gender, scholars also embraced a range of other approaches to explore how spectatorship exceeds the subject positions proffered by film texts, and is also informed by the viewer's social, cultural, material, and/or embodied situation. Foucault, Deleuze, and Merleau-Ponty were taken up to analyze viewers' bodily experiences of cinema. And a range of approaches to theorizing media cultures informed efforts to illuminate the contexts of exhibition and reception, and viewers' culturally rooted

experiences within them, including experiences of difference along the lines of race, gender, and sexuality. In these efforts, scholars drew on work from thinkers associated with the Frankfurt School, from Walter Benjamin to Oskar Negt and Alexander Kluge, as well as with British cultural studies, such as Stuart Hall (Williams 1989; Gunning 1989; Hansen 1991; hooks 1992; Sobchack 1992; Bobo 1995; Marks 2000). At the same time, scholars looking to postcolonial theorists, such as Fanon, Hall, Edward Said, Gayatri Spivak, and Homi Bhabha, underscored mainstream European and American cinema's longstanding imbrication with colonialism, and both analyzed and propelled a flourishing of anti-colonial, diasporic, and minoritarian filmmaking practices (Gabriel 1979; Pines and Willemen 1989; Naficy 2001; Field, Horak, and Stewart 2015).

This heterogeneous body of work situates the film frame within its social, cultural, and material surroundings and examines it as a component of a larger landscape in which it marks cinema's place and mediates viewers' differential relation to cinematic images. As scholars such as Anne Friedberg, Ella Shohat, Robert Stam, and Fatimah Tobing Rony elucidate, at the time of cinema's emergence, its frame participated in the interlinked dynamics of colonialism and industrial-capitalist modernity, supporting contemporaneous ideologies of racial and gender difference (Friedberg 1993; Shohat and Stam 1994; Rony 1996). Tom Gunning explores the role the frame played in shaping early cinematic images and situating them in relation to both their viewers and their larger social and cultural milieus. Whereas theorists writing in the 1970s, such as Heath, observed that "classical" cinema marshaled discontinuous framings into a unified diegetic space, Gunning argues that the maintenance of a continuous and unified *framing* was a hallmark of early cinema. He ties this framing practice to the cultural landscape of the late nineteenth century by contending that it drew on a range of contemporaneous sources, including not only theatrical proscenia but also magic-lantern shows, stereoscope cards, comic strips, and postcards (Gunning 1990, 99-100). Moreover, he observes that such framing practices were intimately tied to the depiction of "foreign views," portraying "not only a distant site but also a particular point of view, one from outside the land viewed" (Gunning 2006, 25). He contends that these practices were thus bound up with both the tourist industry and the legacy of colonialist exploitation – although, he argues, cinematic movement also helped to reveal the ways in which the subjects of such images resisted the controlling gesture of framing (Gunning 2006, 32).

Scholars exploring cinema's relation to race, gender, and sexuality since the turn of the twenty-first century have built on many of these ideas to offer

a nuanced account of cinema's (and, more broadly, moving-image media's) role in constructing and challenging conceptions of social difference, as well as socially differentiated viewers' complex interactions with moving images. Scholars working on African American cinema and spectatorship are exemplary here, and reveal how attention to social difference both draws on and expands the discourses on the cinematic frame. For instance, in *Migrating to the Movies: Cinema and Black Urban Modernity* (2005), Jacqueline Stewart shows how an exploration of Black images and Black spectatorship during the first decades of the twentieth century contributes to an understanding of the frame in both early and "classical"-era American cinema (including the early Black independent output dubbed "race film"). Drawing on ideas from the Frankfurt School as well as postcolonial theory, Stewart conceptualizes Black spectatorship at the intersection of overlapping public spheres that "coalesced around a variety of overlapping and competing institutions, from traditional, noncommercial venues such as churches to new, commercial entertainments such as the burgeoning film industry" (2005, 12). In doing so, she reveals the multifaceted role the cinematic frame plays in mediating the intersections of diverse cultural formations, including but not limited to those upheld by films. By exploring the complexity of Black images and Black spectatorship and situating them within a larger sociohistorical landscape in the United States – especially vis-à-vis the Great Migration and the transformative effect it had on Black communities in Northern cities such as Chicago – she both underscores the ideological role that early framing practices played and reveals how Black spectatorship problematizes the idea that "classical"-era framing and editing practices served to interpellate viewers (see also Maurice 2013).

In *The Witch's Flight: The Cinematic, the Black Femme, and the Image of Common Sense* (2007), Kara Keeling draws on Deleuze, Fanon, Bergson, and Antonio Gramsci to elucidate the ways in which cinema constructs images of Blackness in accordance with clichés, but can also proffer what Keeling calls "kernels of perceptions that might be capable of supporting alternate forms of sociality" (2007, 5). Like Stewart, Keeling provides a conception of spectatorship that accommodates more cultural variability and diversity than that outlined by 1970s film theory. Keeling does this by putting forward a notion of "common sense" that accounts for the ways in which viewers' encounters with cinematic images rely on forms of knowledge that are both sociohistorically rooted and protean. Insofar as cinema encourages affectivity, Keeling suggests, it offers a site in which new forms of knowledge and sociality can emerge. Deleuze's notion of framing, particularly in its function to designate an out-of-field, provides a means of picturing how

cinema simultaneously reproduces common-sense views of the world and can point toward the emergence of new arrangements (see also Davis 2013, 49-69). Keeling identifies the Black femme – a figure that troubles sedimented ways of designating Blackness, femininity, and queerness – with a Deleuzian framing function. As Keeling puts it, the Black femme "is a figure who currently exists on the edge-line between what commonly can be 'seen' and understood (common sense) and what is neither seen nor understood (the Open or, when she makes visible a problem, the outside)" (2007, 143). As a result, the Black femme points to an out-of-field that harbors alternate, emergent configurations of social life.

Keeling's recent book, *Queer Times, Black Futures* (2019), builds on these ideas by engaging with discourses on Afrofuturism, new materialism, and an evolving conversation on race as technology that revisits Heidegger's notion of technology as *technē*. As Beth Coleman and Wendy Chun have argued, race can be understood as both a technique and a mode of framing. It not only serves as what Chun describes as "an invaluable mapping tool, a means by which origins and boundaries are simultaneously traced and constructed," but also opens up forms of agency (Chun 2009, 10, 22; see also Coleman 2009). Keeling shows how these points bear on an understanding of cinematic framing (and vice versa). Quoting Karan Barad, Keeling explains that if

> matter's dynamism carries a sense of "bringing forth new worlds" and "apparatuses are the material conditions of possibility and impossibility of mattering; they enact what matters and what is excluded from mattering," then, in our terms here, technē is a mode of bringing forth within a reality whose boundaries are (still) being adjudicated through the cinematic apparatus and the conditions of possibility and impossibility it brings forth. (Keeling 2019, 134)

In this context, Keeling contends, the formulation "race as technology" offers an alternative to the politics of representation as "another way to grasp the centrality of race as part of the 'material conditions of possibility and impossibility of mattering' within cinematic reality, as well as how we might recalibrate what matters and what is excluded from mattering vis-à-vis race" (2019, 134-135). Despite cinema's role in solidifying racial clichés – and despite the racism underlying Heidegger's discussion of technē – the idea of "race as technology" thus "offers a way to conceptualize the possibilities for materialist anti-racist praxis that still inhere in the cinematic" (Keeling 2019, 135; see also Sheehan 2015, 257-294). In this way, Keeling highlights

how cinema's function as a technology that delineates what does and does not matter intersects with race's operation as technē.

Conclusion

Keeling's ideas about cinematic framing have, to be sure, traveled a good distance from those presented by Münsterberg just over a century earlier. Assembling such accounts within an ongoing dialogue on the nature and functions of cinematic organization and delimitation underscores the important ways in which notions of the cinematic frame and framing have been shaped by specific manifestations of cinema, by cinema's heterogeneous social and historical contexts, and by the diverse social, cultural, and intellectual contexts of the writers analyzing it. Attending to the permutations that the concepts of the frame and framing take across this work illuminates diverse ideas, engaged in an evolving interdisciplinary conversation, about the operation and significance of cinematic organization and its relation to what is believed to lie outside of it. Perhaps most notably, the more recent instantiations of this discourse underscore how formal and material modes of cinematic organization and delimitation intersect with means of social organization and delimitation, such as race, gender, and sexuality. Putting this recent work into conversation with earlier writing on cinematic framing reveals how that insight responds to and itself reframes a set of concepts and concerns that have long fed theorists' interest in cinematic modes of organization and delimitation.

Throughout this discussion, we can trace a persistent interest in thinking through how frames and framing work to mediate the spaces of cinema, both across the actual and virtual dimensions of representation (via the organization of onscreen and offscreen space) and across the domains of representation and spectatorship (via cinema's address to viewers, and its situation in a material and social milieu more broadly). Changing sociopolitical and intellectual commitments, rooted in diverse contexts and orientations toward cinema, have informed debates over the operation, effects, and relationships of and among these processes. Collectively, however, the theories that I have discussed make it clear not only that the frame is more than a physical object, but also that framing is more than a formal – let alone formalist – technique. Recognizing how representation negotiates its formal, material, and social outsides through processes of framing is crucial for understanding the aesthetic and political operations of "immersive" formats and platforms as much as traditional configurations of cinema.

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About the Author

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13. Split Screens: A Discussion with Catherine Grant, Malte Hagener, and Katharina Loew

Nicholas Baer and Annie van den Oever

Abstract

Split screens have become ubiquitous in contemporary media culture, whether we think of TV news graphics, videoconferencing tools, reaction videos, or multichannel art installations. Nicholas Baer and Annie van den Oever hold a discussion with three film and media scholars who have long studied and used the technique in their research, teaching, and creative practice: Catherine Grant, Malte Hagener, and Katharina Loew. Rich in examples, the discussion explores the varied uses of split screen across international film and media history, from the nineteenth century to the present. The participants further address split screen in relation to videographic criticism, authorship and intertextuality, special/visual effects research, and remediation.

Keywords: multi-image aesthetics, embedded windows, film and media history, video essays, special effects, remediation

Research and Interventions in Film and Media Studies

Nicholas Baer and Annie van den Oever (NB/AvdO): To begin, could you all share what drew you to the topic of split screen? And would you tell us about your research on the topic and explain what broader interventions your work stages?

Malte Hagener (MH): Around fifteen to twenty years ago, I started to notice split-screen configurations in a number of different contexts: in video installation art (especially in the multichannel work of Harun Farocki,

Eija-Liisa Ahtila, Shirin Neshat, Doug Aitken, and others); in big-budget and arthouse filmmaking (Lola rennt, Tom Tykwer, 1998; Timecode, Mike Figgis, 2000; Hulk, Ang Lee, 2003; Into the Wild, Sean Penn, 2007); and in television (music videos, advertising, the series 24 [Fox, 2001-2010]). I was struck by how a technique that was often considered overtly baroque and even clumsy was staging such a comeback in different fields.

Looking at the development of split screen since the late nineteenth century, I noticed how the split screen in its specific configuration of two or more images side by side always unfolded a kind of relationality that held a special affinity for presenting "media scenes." (I am referring here to the term "Schreibszene" [scene of writing], coined by literary theorist Rüdiger Campe [1991] to denote the specific coincidence of tool and technology, of practice and cultural coding, of subjectivity and interiority.) Media scenes would be scenes in which media are employed – and the split screen is used to show that double movement of someone using media and the effects of this use (it can be as simple as a remediation of an eyeline match or a shot/reverse shot). In this sense, the split screen allows – and even calls for – film history as a media history, in which the telephone, the television, and the computer have a strong presence.

Katharina Loew (KL): I too have been struck by the co-occurrence of split screens and optical or telecommunication media scenes and their prevalence already in the earliest of films. Broadly speaking, it seems that throughout film history two split-screen application areas have dominated: the representation of media and the representation of thought. In my work on special/visual effects, I found myself drawn to instances that do not simulate a believable reality – an aspect that has long been neglected in special effects research. Split screens are a prime example of effects that represent something outside of the objectively perceivable fictional universe.

I am now working on a larger project that focuses on multi-image effects and cinematic expressivity. Specifically, I am interested in the visual representation of meaning that cannot be captured photographically. Jean Mitry explains that "the image – of necessity the image of something – is in its essence objective and concrete. It is only by association that it becomes a sign, a power" ([1963] 2000, 150-151). How do images that are superimposed or positioned side by side (as in the case of split-screen shots) relate to each other? What "powers" can arise from such an association? Split-screen shots rupture the illusion that film presents direct imprints of a physical reality. By calling attention to the constructability of the filmic image, they posit that photography is inherently the product of human creativity, despite its mechanical origins.

Catherine Grant (CG): In 1997, I designed my course Feminist Media Studies, taught to John Logie Baird Centre MA students in film and television studies (Universities of Glasgow and Strathclyde), around the first UK televising of Lynda La Plante's innovative television series Trial & Retribution (ITV, 1997). I had been drawn to this show as a case study not only because it was a highly unusual example of female TV auteurism at the time, with almost equally rare prominent women detective characters, but also because its pre-publicity had dwelled on the series' highly innovative use of split screen to convey both different perspectives on its narrative events and a sense of parallel temporalities in its depiction of crime, investigation, and justice. The use of split screen turned out to be more of a gimmick than an effective storytelling device, though my students and I concluded that the series nonetheless had one or two compelling moments. Three years later, however, I found myself drawn to another auteurist work employing split screens in a more committed and somewhat less gimmicky way, when Mike Figgis's experimental film Timecode was released on DVD. The split-screen navigational affordances of the DVD in relation to sound design, as well as to Figgis's stated aims for his experiment, became the departure point for my first academic publication on multiple-screen media, "Auteur Machines? Auteurism and the DVD" (Grant 2008).

My sense of the productive *machinic* (or aesthetically, semantically, and affectively generative) aspects of split-screen dispositifs emerged from these earlier encounters. Eventually, I connected my academic interest in multiple screens to my creative work as a video essayist. In November 2010, I published my fourth video essay, which was a single-screen video essay focused on a detailed study of the first split screen in Darren Aronofsky's Requiem for a Dream (2000) and how its act of visual division matches the film's overall themes of psychological splitting. The video headed an extensive entry in my blog, *Film Studies For Free*, on "Split Screen Studies," which included a link to one of Malte's early pieces on the subject (Grant 2010; Hagener 2008). Malte's work has been a great influence on my practical explorations of split screens, along with several of the other studies of this phenomenon published in the same groundbreaking issue of the Australian journal *Refractory* on the topic (Dwyer and Mehmet, 2008).

Striking Instances of Split Screen

NB/AvdO: Many titles have been mentioned already, but could you each give a particular example of split-screen use that you have encountered

or experienced recently, and explain in more detail how it bears on your thinking on the topic?

KL: The most evocative use of a split-screen dispositif I have encountered recently was not cinematic and neither did it involve graphic subdivisions of a single screen. Still, it struck me as an object lesson of what split screen can do. It was Spanish theater director Calixto Bieito's production of Claudio Monteverdi's opera *L'incoronazione di Poppea* (1643), which was originally presented in Zurich in 2018 and moved to Barcelona in 2023, from where it also streamed on ARTE Concert.

Rebecca Ringst's spectacular set design confounds the traditional theater dispositif. The stage is dominated by spectators. Facing the auditorium, a portion of the audience is placed in two raked sections on either side of an illuminated gangway and in front of a cyclorama that serves as a giant projection screen. The action takes place on the gangway and an adjacent oval catwalk that surrounds the orchestra pit. Forming a mosaic pattern on the proscenium boxes to either side hang fourteen vertically and horizontally oriented screens, each between one and five meters in height. They display live footage of the stage action as well as prerecorded work by video artist Sarah Derendinger. The closed-circuited videos are captured by five stationary cameras positioned around the stage area, by camera operators, and by the performers themselves. They function similarly to those at sporting events or rock concerts, guiding the audience's attention and fulfilling their desire for proximity in the context of the totality of a live performance. The prerecorded videos, on the other hand, which are presented in ultra-slow motion, reveal meaning beyond what is evident from Monteverdi's work. They are emblematic yet not explicit. We see Nerone and Poppea playing with soap bubbles and foam while bathing together, Seneca bleeding to death in a bathtub, and Drusilla being savagely beaten by Nerone's henchmen.

In conjunction with the stage action, these videos exemplify what to me constitutes the most interesting aspect of multi-image devices: they offer access to a hermeneutic realm. In Bieito's production, the videos give form to inner states, attitudes, and atmospheres. They expose what is implicit, what is at stake. As Seneca compliments the distraught Empress Ottavia, for example, the enormous cyclorama and four of the proscenium screens show her rival Poppea playing with a crown covered in foam, highlighting her sensuality, ambition, and cajolery. The juxtaposition of scenes makes palpable Ottavia's ideation and counteracts Seneca's flattery. The simultaneous presentation of complementary aspects and perspectives prompts

viewers to create an intricate network of mental connections, which make characters and events appear in a different and more complex light.

MH: I have been struck by the innovative and diverse use of split screen in video essays that I have rewatched recently. These range from the topological recreation of a tenement house in an early D.W. Griffith short Variation on The Sunbeam (Gametxo 2011; https://vimeo.com/22696362), and the reflection on our digital infrastructure in desktop documentaries such as Kevin B. Lee's Transformers: The Premake (Lee 2014; https://vimeo.com/94101046), all the way to Catherine's very simple, but highly effective experimental short Fated to Be Mated (Grant, 2018a; https://vimeo.com/300303270). Here, Catherine turns a generic dance number from Silk Stockings (Rouben Mamoulian, 1957) into an extraordinary reflection on the use of space and figure in Hollywood. What is most striking when looking at the variation is the way in which split screen can be used for many different purposes.

CG: I don't get to see a lot of video installations these days, with the notable exception of the recent Isaac Julien retrospective at the Tate Britain, *What Freedom Is to Me* (an extraordinary collection of multiple-screen works, many of which I had seen before). For me, by far the most interesting work with split screens in very recent times has been happening in my own scholarly field of the screen studies video essay. I'm talking about what Katharina refers to, above, as "graphic subdivisions of a single screen." I'll pick out a couple of the most striking examples, both from 2023.

First of all, there is Barbara Zecchi's very concise work Dancing as Defiance (Zecchi 2022, 2023; https://vimeo.com/782159771), which explores the somewhat unlikely but extremely rich intertextual connections between four cinematic dance scenes in Yorgos Lanthimos's Kynodontas (Dogtooth, 2009), Julia Ducournau's Grave (Raw, 2016) and Titane (Titanium, 2021), and Pablo Larraín's Ema (2019). Zecchi, in her own words, "reconstructs a performance in which the dancers support and empower each other in defiance of patriarchal norms" (2023). In her video, she brilliantly employs her characteristic dynamic grid both to separate and reconnect the scenes and the dancers' bodies, playing with the verticality and horizontality of cinematic aspect ratios, sets, and methods of figural blocking in ways that connect with my own split-screen experiment with dance in Fated to Be Mated, mentioned previously by Malte.

My second example is Katie Bird's desktop documentary With a Camera in Hand, along with her videographic introduction to it, both published in

NECSUS (Bird 2023a, 2023b; https://necsus-ejms.org/with-a-camera-in-hand-i-was-alive/). The desktop documentary is magisterial in itself, including the way that it sets out a hugely dynamic array of screens for essayistic, narrational, and evidentiary purposes. But Bird's introduction innovates – and moves us – possibly even more with its remarkable performative exploration of the forms of a TikTok-shaped (vertical) split-screen selfie video that takes her study of gestures of holding and using tools and technology to sublime heights.

Both sets of videos should be considered in the light of Charlie Shackleton's Frames & Containers (Shackleton 2017; http://mediacommons. org/intransition/2017/05/31/frames-and-containers-0), an earlier brilliantly authoritative and creative audiovisual essay on screen shapes and on the historical flexibility of the cinematic frame and all the other frames it may contain.

Split Screen in Research and Videographic Practice

NB/AvdO: Picking up on your discussion, Catherine, could you say more about how split screen figures in your research methods and the videographic practice in which you are engaged? How has your own use of split screen informed your thinking about it?

CG: One of my longstanding areas of scholarly research interest has been film authorship and intertextuality. This focus inevitably requires the employment of methodologies of comparison, and my use of split screen in my videographic work has largely emerged from this interest. My practical explorations of spatial montage techniques for this research, including juxtaposition, have been hugely informative. Indeed, I would say that multiscreen videomaking is now one of my main forms of research and publishing, with split-screen works numbering in many dozens of the several hundred video essays I have composed.

My first written reflection on these techniques was published in 2013 by the UCLA journal *Mediascape*, under the title "Déjà-Viewing? Videographic Experiments in Intertextual Film Studies" (Grant 2013). In this collection of five videos, published with my written exegesis, I explored how split-screen videomaking allowed a literalization of Mikhail Iampolski's insight about cinematic intertextuality. He claims that "[b]y inserting the 'source' of a cinematic figure into a film as its subtext, the intertext can also function as a generative mechanism" (Iampolski 1998, 246). Iampolski wasn't writing about

Fig. 13.1: Still image from Catherine Grant's Screen Memories: A Video Essay on Smultronstället / Wild Strawberries (2018).

actual forms of "insertion," of course, but about a process of intertextually motivated reading, one which could be highly effective in a screen studies context, I argued, if it could happen simultaneously, say in an array of contiguously presented film extracts (or "quotations") in the same frame or screen container. In "Déjà-Viewing," then, I explored how split-screen videos enable their scholarly viewers to experience for themselves:

> synchronous moving image and sound juxtapositions in real time. As well as an exposure to audiovisual argumentation (involving selection of evidence, montage and mise en scène, titling, sound editing and other creative effects), they offer an active viewing process, one of live co-research, or participant observation. Unlike written texts, they don't have to remove themselves from film-specific forms of meaning production to have their knowledge effects on us. And we can feel, as well as know about, the comparisons these videos enact. (Grant 2013)

In this 2013 article and also in my 2018 video essay piece Screen Memories … (Grant 2018b; https://vimeo.com/251838111), which compared two scenes in Ingmar Bergman's 1957 film Smultronstället (Wild Strawber-ries) (Grant 2018c, 21-29), I theorized how split screens encourage the roaming of what Roger Cardinal calls the "mobile eye," or "peripheralised attention," and "decentered scanning [that] can constitute a refreshing alternative register of filmic experience" (1986, 112). Alternatively, Paul

Willemen would have called this a "critical trawling operation" of unfolding comparison (1994, 238). In other words, split-screen film studies videos call for a perceptual or spectatorial posture that is very much like the one that Christian Keathley characterizes as central to a "cinephiliac" mode of watching films" (2006, 6).

This posture also resembles, at times, the kind of ocular "grasping" at patterns that Laura U. Marks posits as central to haptic visuality (2000, 2002). For an exploration of Marks's work, see my video TOUCHING THE FILM OBJECT? (Grant 2011; https://vimeo.com/28201216).

Split Screen as Cinematic and Transmedia Phenomenon

NB/AvdO: As is clear through the examples mentioned so far, the three of you focus on the international history of film. How do you narrate this history in terms of the uses of split screen? And how does the study of split screen reshape our understandings of media history and the relation between media?

MH: One central aspect of how the split screen has been used in general is a remediation of other media – or maybe, rather, a reaction to other media. What still constitutes the central case of split-screen usage is the telephone situation, which is deeply paradoxical: acoustic presence and visual absence. The classic case here is PILLOW TALK (Michael Gordon, 1959), but even more recent examples such as PHONE BOOTH (Joel Schumacher, 2002) still adhere to this logic.

More central to my thinking about the aesthetic form, though, is how split screen has been used to launch experiments and train audiences – split screen can be seen as a veritable laboratory for living in a media-saturated environment. In presenting two images simultaneously, there is always the question of the relation between the two images, not least because the combination of two (or more) images within the same frame is always external and obvious. The relation between the images can be conceptualized as temporal (are they synchronous or not?), causal (one image can be the cause and the other the effect, as for example in CARRIE [Brian De Palma, 1976]), or allegorical (one image standing in for a larger concept in the other) – and other relations are possible as well. In this sense, split screen can be seen as training spectators to operate in media-saturated environments with multiple images (and image sources), which are now a relatively normal part of life in developed urban environments.

KL: Remediation is indeed a fascinating aspect. The paradoxical telephone situation that Malte rightly highlights presumably constitutes the most common application of split screens. Yet the question of remediation not only pertains to split-screen representations of film, television, computers, magic lanterns, mirrors, and so on, on film, but also to the real-life media environments that the split-screen dispositif was part of long before its first appearance on film.

Works of Western fine and folk art, such as polyptychs, trompe-l'œils, cantastoria banners, and votive panels, frequently presented pictures in divided, yet correlating sections. In nineteenth-century media – postcards, lantern pictures, illustrated press, advertisements, or posters – multi-image aesthetics were disseminated on a mass scale. Around 1900, Germany alone produced nine million picture postcards every month. Many combined various pictorial elements, and their look is evident in the earliest split-screen films. Santa Claus (George Albert Smith, 1898), for example, shows a nursery with sleeping children as well as a circular insert of Santa Claus on their roof. This visual design closely resembles the appearance of nineteenth-century postcards or lantern slides.

Similarly, during the first decades of cinema, depictions of phone conversations followed nineteenth-century pictorial conventions and showed the parties on the phone in panels to either side, while the space in between (or the conversation subject) was represented on a middle panel. In the 1920s and 1930s, the use of split screen attests to an intense dialogue with avant-garde practices and commercial design. For me, split screen thus constitutes not just a cinematic but also a transmedia phenomenon that poses the question of why we are so fascinated with juxtaposed images.

The Split Screen as Technique, Dispositif, and Mode of Address

NB/AvdO: As a final question, how would you situate split screen in relation to the central terms of this volume such as technique and technology? How do these and any other key terms (e.g., dispositif, trick, effect) weigh in your work on the topic?

KL: When we think of the term "split screen," we usually associate it with one specific look: two (sometimes more) square panels with explicit borderlines. However, this dispositif is not identical with split screen as a technical approach *tout court*. In analog cinema, split-screen composites were created with the aid of multiple exposures or combination printing. During

each exposure or printing, mattes and counter-mattes had to protect the frame from light. Depending on the mask shapes, the resulting split-screen composite could feature rectangular, round, or multiform components.

The split could also be intended to remain imperceptible. Invisible split-screen shots were often employed to create the illusion of an environment that was not present at the filming location, such as the station master's office window in The Great Train Robbery (Edwin S. Porter, 1903) or the warehouse at the end of Raiders of the Lost Ark (Steven Spielberg, 1981). Directors like David Fincher and Wes Anderson have employed split-screen composites to combine preferable aspects of subsequent takes in one shot. Stunts, such as encounters between protagonists and leopards in Bringing Up Baby (Howard Hawks, 1938), or the tramp skating blindfolded next to the precipice in Chaplin's Modern Times (1936), are more safely filmed in separate takes.

Further, much of the potency of impossible views, like representations of doppelgangers – from Onésime vs. Onésime (Jean Durand, 1912) to Adaptation (Spike Jonze, 2002), or extreme size differences – from Cheese Mites, or Lilliputians in a London Restaurant (Walter R. Booth, 1901) to The Lord of the Rings: The Fellowship of the Ring (Peter Jackson, 2001) – have relied on concealing the fact that portions of the frame were filmed at different times. The conventional split-screen dispositif is but one iteration of split screen as technique.

MH: Indeed, as Katharina succinctly points out, for most of the twentieth century, split screen was a special form of multiple exposure or multiple printing. If we look at the split screen as trick or effect, we have a huge field which includes matte shots, the Schüfftan effect, and blue screen technique. The most quintessential case might be the multiplication of a movie star, often as their own twin brother or sister, such as Olivia de Havilland in The Dark Mirror (Robert Siodmak, 1946) or Heinz Erhardt in Drillinge an Bord (Triplets on Board, Hans Müller, 1959). Indeed, what makes the split screen as a form so fascinating for me is how it exhibits its own making and often looks for a motivation for the juxtaposition of images.

The split screen in this narrower sense – and this is how I understand it in my book, *Splitscreen: Das geteilte Bild als symbolische Form in Film und anderen Medien* (Hagener 2024) – is always hinting at an authority beyond what we see because two images come together in an unexpected way. Then again, in our networked and interfaced present, this has turned into a new reality, so we might need less of an explanation. A film like Pillow Talk, perhaps the most classic case of split screen, still needed a double

motivation for its technological ploy: the party line (two people unknown to each other sharing a telephone connection) and the formation of the heterosexual couple (since the similarity and fitting of the images can only be seen by us as spectators). Today, split screens (or rather, the multiple windows on our digital devices) have become our new reality with reaction videos, embedded windows, and effects on Instagram or TikTok as the defaults of our media culture.

KL: I'm intrigued by Malte's reference to "an authority beyond what we see." It is a mode of address that I feel has been neglected in film scholarship. The phenomenon also pertains to other conspicuous cinematic devices, for instance, spectacular camera effects like extreme camera angles or daring camera movements. They too disrupt the illusion of objective representation and call attention to an agency (authority) that evaluates and interprets the profilmic events, introducing figurative layers of meaning – that is, a hermeneutic dimension. It may be true that in our media environment, which is characterized by persistent, often-simultaneous engagement with multiple screens and an omnipresence of video graphics that are divided into overlapping and adjacent parts, split-screen shots have forfeited some of their impact. Nonetheless, they remain a powerful expressive device.

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14. Specks of Time: Digital Editing and Verse Jumping in Everything Everywhere All at Once

Kartik Nair

Abstract

Nonlinear digital editing software programs such as Adobe Premiere Pro have unleashed a new kind of editorial labor. Using Everything Everywhere All at Once (Daniel Kwan and Daniel Scheinert, 2022) as his case study, Kartik Nair explores the editorial labor of choice that supports virtual images. Everything Everywhere All at Once is a multiverse narrative about a day in the life of an ordinary, middle-aged, Asian American woman who must learn to jump across universes (or "verse jump") in order to save her family and the world. Nair argues that the film's montage is the aesthetic expression of digital editing's capacities for selection, intervention, and assemblage – and that "verse jumping" is an allegorical performance of the materiality of choice labor.

Keywords: digital editing, motion capture, labor, Adobe Premiere Pro, gesture

You are looking at one of the more memorable images of Everything Everywhere All at Once (Daniel Kwan and Daniel Scheinert, 2022). It is not a frame from the film, like the many promotional stills that were disseminated over social media in the run-up to the film's release. These offered varied views of the film's heroine Evelyn Quan Wang, showing superstar Michelle Yeoh in an extravagant array of colors, styles, and martial poses that signaled the action, comic, and melodramatic appeals of this multiverse movie. The image you are looking at, by contrast, came into public view after the film had already been in theaters for a number of weeks, and as appreciative curiosity began to grow about the making of the film. However, the image
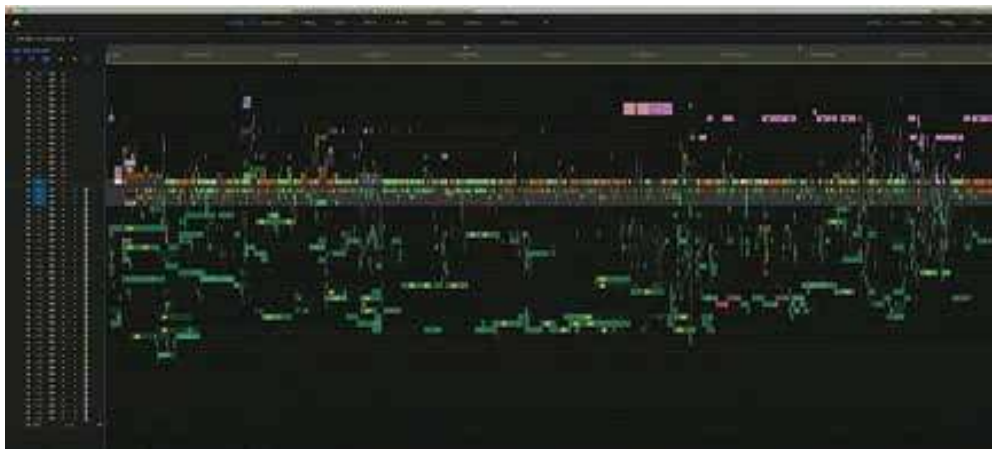
Fig. 14.1: A post-production still from Everything Everywhere All at Once, 2022. Source: @valentinavee, Twitter, May 6, 2022.

is not a production still either – it is not a photograph of Yeoh, or co-stars Stephanie Hsu, Jamie Lee Curtis, and Ke Huy Quan behind the scenes. Nor is it a snapshot taken after filming had wrapped, such as an image of a visual effects artist seated before a computer, working on one of the film's virtual spectacles (a giant floating bagel or a talking raccoon). Indeed, what you are looking at is not even a photograph.

Rather, it is a capture of a computer display – a screenshot of the film's timeline as it appears in Adobe Premiere Pro, the popular digital editing program that was used by the film's editor, Paul Rogers, to assemble the film. In April 2022, a few weeks after the film's release, Rogers was invited to speak at an event organized by Adobe Inc. about his experience editing Everything Everywhere All at Once (henceforth, Everything Everywhere) on Premiere Pro. His presentation was livestreamed and uploaded to Adobe's Facebook and YouTube pages, from which this image was excerpted and posted to Twitter (now X) by *Aperture*'s Valentina Vee, with the caption: "This is the timeline for #EverythingEverywhereAllAtOnce" (@valentinavee, May 6, 2022). We might then call this image a "post-production still," for it renders visible the post-filming processes by which the film was prepared for release. Though it is not an image *from* the film, it is verily an image *of* the film – or what the completed film looks like in a digital editing program.

The screenshot also stills the frenetic Everything Everywhere into something like a freeze-frame for contemplation. Everything Everywhere tells the story of a day in the life of Evelyn Wang (Yeoh), a middle-aged Asian American woman juggling the pressures of caregiving, child-rearing, marriage, and work while navigating an IRS audit of her laundry business. As the day unfolds, Evelyn learns that she is only one of the many Evelyns to exist – that every choice Evelyn has made in her life has forged a new

universe. "Every tiny decision creates another branching universe," she is told. Now a deadly threat is stalking Evelyn across the many branches of the universe, and it has fallen, improbably, to this mediocre version of her to save the multiverse. As it is explained to Evelyn, "every disappointment, every rejection has led you here, to this moment." Rising to the occasion, our average Evelyn learns how to "verse jump" from one universe into another, so that she can access the skills of other – faster, stronger, better – versions of herself, who are, for example, opera singers and movie stars, in parallel universes. EVERYTHING EVERYWHERE concludes with Evelyn disarming her nemesis, saving the multiverse, and, most importantly, reconciling the battling generations of her family – from her permanently disappointed father to a queer daughter in search of approval.

Made by the studio A24 on a reported budget of $15 million and released in March 2022, EVERYTHING EVERYWHERE has since become the studio's highest-grossing release of all time, with an estimated $143 million in global box office receipts. Winner of seven Academy Awards including Best Picture, EVERYTHING EVERYWHERE has also been praised by critics for addressing themes of generational trauma, institutional racism, bureaucratic violence, same-sex desire, and social-media-driven anxiety and depression with its bravura style and storytelling. While some critics may have been unmoved – *The Guardian*'s Peter Bradshaw deemed it "a formless splurge of Nothing Nowhere Over a Long Period of Time" (Bradshaw 2022) – most others were closer in their assessment to Justin Chang who, in his review in the *Los Angeles Times*, noted that the film is "a story of redemption and reconciliation, as sweet and sentimental at its core as it is deliriously busy on the surface" (Chang 2022).

That "busy" surface conveys the existence of multiple Evelyns in multiple universes. These universes are the result of different choices in Evelyn's life story, and EVERYTHING EVERYWHERE makes the differences palpably cinematic in choices of generic stylization: the recognizable conventions of science fiction, horror, martial arts films, domestic romance, and art cinema code each universe differently, and jostle against one another. This yields stunning cross-generic assemblages onscreen, as when we see Evelyn jump through "specks of time" in dozens of universes, rendered apparent by varying iconographies, aspect ratios, film stocks, and even animation styles flitting across the screen in a matter of seconds. Writing about the film's traffic with genres, Jason Coe observes that, because the film is "fluent in genre storytelling," it "can be everything to so many because it reproduces the genre conventions that Asian American audiences find most legible" (2023, 41). Coe notes that the film "builds the worlds of its multiverse by

deploying every imaginable transpacific film genre: dystopian science fiction, wuxia, kung fu, superhero, anime, romantic comedy, immigrant family drama, art house, nostalgic romance" (2023, 35). Hence, EVERYTHING EVERYWHERE has also been received as a "deeply Asian American film" (Cheng 2022), such that its "code-switching" moves between transpacific cinematic genres that enact the code-switching of minority communities as they switch affects, accents, and performative modes in everyday life. "Despite their differences," Coe argues, "the peoples of Asian America can identify as a virtual community because they watch the same movies and recognize each other and themselves in their filmic representations" (2023, 41). This forges a sociality around the film's viewing, with communal histories of media consumption pinged by the film.

Unlike Coe, however, I could not quite identify many of the film's referenced texts. Instead, I was aware of a kind of general allusivity that was taking place because of changes in film grain, color, aspect ratio, and other design elements. Effectively, EVERYTHING EVERYWHERE conveyed the different universes as so much cinematic footage, as though each universe were an excerpt from a different film that was being compiled into a new film before my eyes. Each sequence was storyboarded and filmed to appear not as if emerging, but as already existing in a parallel universe. With film history at its fingertips, EVERYTHING EVERYWHERE played for me as the active collation of filmed footage. Consequently, instead of pleasurable recognition of the reference being evoked, it was the *work* of collation that drew my attention in the verse jump. This work is what gives the film's timeline in Premiere Pro its staggering richness: the longest stacks of green bars index sequences in the film that were made using the greatest number of interventions (of visual effects, sound effects, and transitions between shots).

Perhaps initiating a new genre of behind-the-scenes coverage, the screenshot is also a radical break from the most iconic images of the film editing process created in the twentieth century: photographs of Sergei Eisenstein, Yelizaveta Svilova, or Thelma Schoonmaker bent over editing tables, feeling the filmstrip, or observing action on one screen while moving celluloid footage using a foot pedal. By contrast, the post-production still disappears human labor almost entirely in favor of an image produced by a program. Vanishing editors from the scene, the screenshot seems to vaporize the corporeality of filmmaking. But once it was posted on Twitter, EVERYTHING EVERYWHERE's timeline image went viral, attracting thousands of likes and retweets. Comments ranged from amazement at the density of filmmaking labor inscribed in the film's digital-material base to appreciation of how its fractalized neon evokes the mise en scène of Lana and Lilly Wachowski's 1999 film THE MATRIX

(a key reference for Daniel Kwan and Daniel Scheinert in their creation of EVERYTHING EVERYWHERE). Responses that marveled at the screenshot as a sensuous artifact in its own right were reminders that the timeline is itself a representation: digital operations have been rendered visually intelligible to the humans who worked on the film and to those who subsequently watched it. The timeline flattens the film's explosive montage action into one lateral plane, containing the heterogeneous universes of the film's diegesis as so many bars of green that could be easily observed from a distance.

It is reasonable to conclude that the timeline gained viewers' admiration because it tracked with their experience of EVERYTHING EVERYWHERE – a resonant remediation of the film's storyworld *as* infrastructural image. The screenshot visualized the "behind-the-scenes" workflow of contemporary editing, allowing viewers to linger over and appreciate the infrastructural support of virtual images. In this chapter, I want to explore this remediation, but in reverse: while the Premiere timeline is an indexical representation of the finished film in another medium, I propose that EVERYTHING EVERYWHERE is the narrative and visual remediation – the cinematic representation – of its digital editing workflow. I argue that the film's montage is the aesthetic expression of digital editing's capacities for selection, intervention, and assemblage – and that "verse jumping" is an allegorical performance of the materiality of contemporary editorial labor.

Contemporary film editing may not look like analog film editing, which characterized the first century of filmmaking. Analog editing's physical operations, requiring a blade, splicing tape, and glue, transformed cinema over time, leaving their literal marks on the body of the filmstrip and in the evolution of film grammar. These operations also left their marks on the hands and on the backs of editors, as well as on their imaginations – film editors were key engines in the reinvention of modern space and time. The work of editors was corporeal and risky, with one editor, Virginia Katz, recalling that you could "lose film," or "rip the film trying to feed it through the Moviola"; you might also have "ripped fingers from sprocket holes" (Katz, quoted in Chang 2012, n.p.). But digital editing, the same editor notes, has changed all of that: "it's so easy to make changes when you're editing digitally" (Katz, quoted in Chang 2012, n.p.). That ease is in part because nonlinear editing software programs like Adobe Premiere Pro have emerged to handle film editing. The immense flexibility, storage capacity, and modularity of such programs have undoubtedly powered the reimagination of cinematic space and time evident in the "impact aesthetics" (King 2002) of "chaos cinema" (Stork 2011; Shaviro 2012) and multiverse films, but they have also demanded a new kind of decisioning labor from

editors – of choosing, of making infinitely smaller decisions with ever greater frequency. By exploring the decisioning labors of editor Paul Rogers and assistant editors Zekun Mao and Aashish D'Mello during the film's remotely completed post-production, I bring into view their choice labor via the multiversal heroics of Evelyn Wang.

Multiverse Montage and Motion Capture

Multiverse narratives are fictional narratives in which two or more previously total realities, worlds, or universes are revealed to be permeable parts of a whole, or a multiverse. Rather than the "world-hopping" of other sci-fi films, these films unveil isomorphic versions of the same world. While multiverse narratives have existed as long as there has been narrative – and with a wide purchase in philosophy, religion, and science – "multiverse film" identifies a comparatively recent film genre. Drawing on lay and latent ideas about quantum physics and complexity science (often parroted or parodied by their characters), multiverse films have also allowed film studios to consolidate transmedia franchises: recent American variations of the multiverse film include such titles as DOCTOR STRANGE IN THE MUL-TIVERSE OF MADNESS (Sam Raimi, 2022) and SPIDER-MAN: NO WAY HOME (Jon Watts, 2021). For audiences, the promise of journeying the parallel lines of the multiverse charges the viewing experience with what we might call a multiversal potential: we look forward to moving across universes shaped by minor variations into major heterogeneity. Multiversal potential finds many expressions in EVERYTHING EVERYWHERE. Seemingly endless arrays of office cubicles, laundromat machines, laundry bags filled with clothes, CCTV monitors in video banks, and stacks of receipts within the film signal portals to other places, while the film's use of split-screen compositions, quick pans, in-depth staging, changing aspect ratios and racking focus suggest chaotic simultaneity. Primed by such potential in the film's mise en scène and compositional strategies, the viewer is prepared to "verse jump" with the film's heroine, Evelyn.

The verse jumps of EVERYTHING EVERYWHERE are moments in which Evelyn accesses "another version of herself from another universe" in order to retrieve something of herself from that universe. Verse jumping does not quite require Evelyn to jump literally, but verse jumping is embodied. Initiating the jump across universes involves executing physical acts as triggers for what are metaphysical leaps across time and space. One verse jumper informs Evelyn that "We developed an algorithm which calculates

which statistically improbable action will place you in a universe on the edge of your local cluster, which then slingshots you to your desired universe … the stochastic path algorithm is fueled by random actions." To verse jump, Evelyn has to (at various points) close her eyes, switch her shoes, chew gum, eat ChapStick, or staple paper to her forehead – gestures that allow Evelyn to temporarily access other universes. While THE MATRIX's Neo becomes a hero by having various martial arts "downloaded" into his avatar, EVERYTHING EVERYWHERE depicts Evelyn gaining these skills by accessing other versions of herself in other universes. In some of the more affecting sequences from the film, parallel editing depicts Evelyn as she verse jumps to access the life of another Evelyn: a blind opera singer, a martial arts superstar, a service worker spinning a pizza sign. From these other versions of herself, Evelyn brings back with her a specific skill, such as how to move without breathing or seeing, how to flex a muscle, or how to spin.

As Evelyn surfs the multiverse in search of appropriate bits of information from which to assemble her reality, EVERYTHING EVERYWHERE enacts this adventure as the gathering of so many "specks of time" into a coherently heroic "timeline." In one such sequence, Evelyn verse jumps to a version of her life in which she never left China, was blinded at an early age, and rose to fame as a blind opera singer; downloading the skills of "improved mobility" and "increased lung capacity" from this other life allows Evelyn to navigate a smoke-filled fist fight in hers. As the fight escalates, however, it demands other skills: Evelyn next jumps to a universe in which she is a streetside worker spinning a large cardboard sign; from this version of her life, Evelyn downloads the ability to juggle a shield and thereby dominates her foes.

Attention to editing strategies in this fight sequence reveals the structural affinity between narrative cinema in general and multiverse films in particular. Worldbuilding, Alain Boillat writes, "is not solely about the referent of the representation, but also about film form: in cinema, building a world is inseparable from […] editing its images" (2022, 225). In narrative films, it is often montage that builds worlds: montage forges a sense of parallel realities that are accessed, arranged, and eventually aligned by the narrating intelligence behind the film. For Boillat, montage is key to how multiverses are staged, serving as both important infrastructural supports and rhetorical principles in multiverse films. While Boillat underlines cross-cutting and parallel editing as important tools for the generation of multiverse effects, EVERYTHING EVERYWHERE also foregrounds two more editing principles in the production of its multiverse: *matching on action* and *graphic matching.* Action films match on action to give kinetic intensity to fight scenes without sacrificing spatial and temporal continuity; multiple perspectives on a single

gesture in time and space may be assembled together as long as there are no perceptible ruptures in the depicted action. Graphic matches (or match cuts), meanwhile, suggest similarity between disparate objects by matching the graphic qualities of juxtaposed frames: such matches draw attention to the pictorial (rather than dynamic) qualities of a frame.

EVERYTHING EVERYWHERE combines matches on action with graphic matches to generate a sense of parallel actions that are similar *across* different times and places: a close-up of an opera singer's face, mid-inhalation, cuts to a close-up of another Evelyn's face, also mid-inhalation; a wide shot of Evelyn spinning a sign on the sidewalk cuts to a wide shot of another Evelyn spinning in a brawl. The effect of this strategy is a different kind of *graphic match on action*, not so much the complementary completion of a single depicted action across the cut but the perfect repetition or doubling of the depicted action in quick succession. The conventional strategy of matching on action helps to increase the affective impact of what might otherwise be too small or quick a gesture so that film form enacts the action hero's agency for speed, movement, and dislocation. By contrast, EVERYTHING EVERYWHERE's matches allow us to see how a gesture is matched: the imitation of micro-gestures, enacted within and by the match on action, enacts the importation of skill sets. Evelyn is being constituted inter-corporeally, her physical body retracing the movements of other bodies in other times and places.

Indeed, as Evelyn taps into the skillful movements of her multiversal counterparts, she refines her own particular skill with every verse jump, a skill for capturing the movements of others and making them her own, without any mediating distance. The match on action renders this vivid by repeating (or matching) the same action – the tilt of a head, the arch of a back – first in one setting, and then repeated by another Evelyn in a second setting. Via repeated juxtapositions of disparate Evelyns in the same movement, montage allows us to perceive motion itself as it is transplanted from one performing body to another – movement as it is isolated, extracted, and abstracted from the body that originated the movement.

At this point, I want to suggest that what the film is depicting by graphically matching on action in such sequences is a kind of *motion capture*. In filmmaking, motion capture is typically understood to be something quite different: it is the practice of recording the physical movements of human bodies and using those movements to animate computer-generated bodies, thereby producing virtual movement on the screen. Such a description of motion capture is of course apt for motion and performance capture technologies in filmmaking; we can see how this applies to a film like

Avatar: The Way of Water (James Cameron, 2022), for which the slightest, even involuntary gestures of performing faces and bodies were captured and retraced as the gestures of fictional characters. In recent and important work, scholars including Tanine Allison (2011) and Mihaela Mihailova (2016) have unpacked the hierarchies of labor implicated in motion capture technology. While scholars have focused on how films use performance or motion capture in their production, Everything Everywhere offers us a slightly different perspective on the idea of the mobile trace.

Everything Everywhere textualizes a mode of contemporary film production, and in so doing virtualizes the many Evelyns whose movements provide the basis for the animation of our own Evelyn. But the film's expansive fantasy of motion capture also allows us to expand our sense of what motion capture is. Digital motion capture involves recording physical human movements to animate computer-generated characters, creating virtual motion on screen. However, this needn't be the only definition of the concept, which could reveal the various types of human movements captured in digital image-making algorithms.

While industrial discourses euphorically celebrate (and selectively showcase) how the performances of famed actors supply the basis for virtual characters onscreen, these discourses efface a wider range of human movements required to generate the spectacular imaginaries of contemporary film and media. Complicating narratives of automation, a critical approach to motion capture can uncover how the human body is disciplined in the production of a new order of traces, one in which the trace itself is in motion as much as it is the trace of a motion.

As I have already argued, the film depicts, with what seems startling directness, a kind of motion capture – the trace of a movement mediated and translated between worlds. As a result, the corporeal movements of Evelyn on an opera stage, a movie set, a sidewalk become movements Evelyn can undertake in her battle in an office building against the forces of evil. What the film depicts then is an expressive form of what Brian Rotman finds fascinating about motion capture as a "form of transposed physicality": this is an "arena of capture in which content is encompassed transnotationally as (the trace of) performed movement" (2002, 428). With motion capture, he writes, "the kinetic patterns stored by motion capture disembed and deterritorialize the original motion from the place, time, circumstances, physical form, cultural particularity, and presence of its performance" (Rotman 2002, 430). Thus, "released from their originating situations and instantiations, they can be reterritorialized onto a still-proliferating range of physical situations and re-embedded within any number of contexts.

Captured motion is able to be endlessly reinstanced and rerealized" (Rotman 2002, 430). Rotman concludes by writing that such a gesturology has "theoretical implications" for the "status of human corporeality" (2002, 434).

As Evelyn learns how to verse jump, she begins to glimpse different specks of time from her own life. Staring at her open hand, she slowly closes her palm and turns her wrist. With each turn, Evelyn skips along her timeline; the ensuing sequence is assembled from several discrete close-up shots of the same hand in different times and places – at a table, holding a fork; on a couch, reaching for another's hand; on a hospital bed. But as the wrist flicks, and the palm turns, we also hear what sound like clicks at the transitions between shots. It is the work of a different hand, of course, which is powering this multiverse montage: transfigured onscreen is a captured movement, a certain way a human hand, manipulating a mouse, brings images together with a click. The audience of the editor's performance is the computer program, but the resulting spectacle shows us a hand onscreen cycling through universes. Therefore, every time the film shows us Evelyn's increasing power for verse jumping, this fantasy is mediated by the affordances and limits of montage.

Mediating between the digital-material infrastructure and the cinematic representation is the embodied work of film editing, linking infrastructural operations "off" screen with super-heroic effort on the screen. As a way to extend what I have elsewhere termed the "phenomenology of film production" (Nair 2022) – or filmmaking as a series of perceptual encounters between human bodies and technological environments in which bodies materialize and dematerialize – I want to use the space offered here to ask if this phenomenology of the gestures of filmmaking can be felt in screen gestures. EVERYTHING EVERYWHERE is not *about* editing, but the film does thematize selection, relation, and reassembly. After all, as one character learns, it is about "how the smallest decisions can compound into significant differences." Its representation of these themes is evoked in the expressive materiality of a cinematic form that feels like a performance of a nonlinear editing platform. I turn next to how the corporeal gestures of the film editor unfold within the digital editing environment, shaping the film's assembly and becoming allegorized within the film's verse jumping.

Reading for a Platform

Adobe Premiere Pro has brought high-end digital editing tools within reach of many amateur users, and is now used by professional film and

television editors as well as film students and social media influencers. Like its primary rival Avid, the software has generated thousands of how-to videos and manuals, as well as specialized kinds of screen setups and mouses with hotkeys. Premiere Pro (henceforth Premiere) is distinguished by its workspace interface, with a four-quadrant display to reflect raw video files (assets), a pane in which to play or view these, the timeline into which these can be assembled, and a pane in which to view this assembly. On large projects, an editor may set up multiple screens so that the timeline or the final sequence output can be viewed on a large screen instead of inside a quadrant. The image with which I began this article is of the third quadrant, the timeline, shared by the film's editor Paul Rogers, who had worked on documentaries and music videos before he came to collaborate with the filmmaking duo the Daniels.

The Daniels wrapped filming on EVERYTHING EVERYWHERE in March 2020. The offline edit had just begun, when, five days in, the COVID pandemic forced the film's post-production to go remote. In this situation, Rogers edited the film from his home, supported by the remote work of two assistants, Zekun Mao and Aashish D'Mello. Mao made sure the same copies of files propagated across hard drives, ensuring a seamless coordination of editing, sound, and visual effects decisions that were being made over endless chains of text messages and phone calls – all finally manifesting on the Adobe Premiere Pro timeline. A self-avowed Premiere faithful, Rogers has been using it for years in his own post-production house, Parallax. "I love Premiere because it kind of disappears when I'm using it," Rogers shared in an interview (Adobe Video & Motion 2023). This is very close to evoking Heidegger's notion of "ready-at-hand" technologies, whose essence withdraws in their use. In some ways an admission of a nonhuman agency with which the human editor interacts, Rogers's description is also an externalization of the editor's own intelligence, in that the machine is where he seems to be working out his own imaginative and material capacities.

While Rogers and his team were working on the film, they were in touch with Adobe and in-house developers of Premiere, who sent them patches and beta features in response to queries or problems. It was a collaborative venture with Adobe, and a new feature formed the bedrock of this collaboration. Called Productions, the feature allowed multiple editors or individuals to share, grab, or hand off sequences, while reducing the size of each project. "This movie," Rogers concluded, "would not have been possible without Productions." "We were constantly *jumping* in and out of each other's projects," the three editors recalled (emphasis mine), using "weird processes that we invented just for this film." "We were all over the place,"

Rogers states, sharing that Productions further enabled him to implement a protocol he used at Parallax (Adobe Video & Motion 2023). Sometimes, seven or eight editors would work on the same shot or sequence; Rogers calls them a "swarm." The edit team communicated using online channels including Evercast, Frame, Slack, and Zoom. When asked in an interview with *Screen Rant*'s Owen Danoff, "How close was your collaboration, on the edit? Were you screen-sharing with them and getting really specific?" Rogers said,

> Yeah, it's very close. And we also used Productions, which is a feature of Premiere Pro, where you can share [your projects], and I can jump into their project while they're working. We were all synced up from our different homes; all of our hard drives are synced in real time. The way that I've always worked with them is super collaborative. We jump in and out of each other's projects. We share things. They edit on stuff, and I take it, and put ideas down, and give it back, they'll do more ideas and give it back, and that's the gist of it. (Danoff 2022)

Allowing editors to "jump in and out of each other's projects," cloud-based, web-driven digital editing platforms like Premiere evidence a new collective decision-making practice that is based on instantaneity, granularity, and modularity. In particular, this networked labor must synchronize its effort to correctly remap time. Time remapping, a feature on Premiere, allowed Rogers and other editors to access a filmed sequence and adjust the speed at which different parts of the same sequence would play. After selecting a keyframe from a sequence (the frame that would mark the beginning of a modification, such as time remapping or a visual effect), six or seven VFX (visual effects) artists, many of them friends of the Daniels, were called in to help work on the look of the film at the same time: music video directors, VFX artists, as well as stunt artists familiar with After Effects and Resolve. The interventions of this swarm are especially evident in the film's kinetically assembled action sequences and the apparent speed at which filmed action changes within single shots. When our Evelyn is shoved by one of her adversaries, action slows down (mid-shot) to emphasize the disorienting impact; when she recovers, action speeds up to depict an energetic intensification of her efforts. Anticipating this intensive post-production "time remapping" process, the Daniels had deliberately "over-cranked" many shots while filming, giving the editors a wealth of footage to play with. But time remapping "over-cranked" shots also instantiates a broader trend that has arisen with contemporary digital

editing programs: these programs not only allow, but have almost come to require, the making of ever-greater numbers of individual choices at the editorial stage. The choice labor of contemporary editing, I argue next, is formalized in the overwhelming spectacularization of montage in EVERYTHING EVERYWHERE. In EVERYTHING EVERYWHERE, verse jumping is the felt expression of digital editing's capacities for montage, modulation, and granular intervention.

Choice Labor

Though it is a lot of work, making choices is the only way to make meaning – this, at least, is the lesson offered by EVERYTHING EVERYWHERE. The film suggests that making choices is the only way to safeguard against the deafening chaos of infinite possibilities and fantasies of unlived lives. When as IRS agent derisively declares to Evelyn that she can "see a story" in the Wang family's itemized receipts – "With nothing but a stack of receipts, I can trace the ups and downs of your life" – we appreciate that each of these receipts also tracks with a choice, tracing the "ups and downs" of life. However dispiriting, these choices are what give coherence to Evelyn's biography.

Growing reflective in an interview, editor Paul Rogers notes that he could have assembled a different version of the film, one that told the same story but used entirely different takes. "I've never thought about it that way," he concludes, "but when you're cutting the film, each choice you make editorially is kind of a parallel universe that you could take" (Schonfeld 2022). In his editorial work, Rogers was enabled by Premiere's affordances, which he describes thus: "You could use Premiere in ways that it was not designed to be used without breaking it" (Garland 2023). The final cut was the one that prioritized audience intelligibility; "You just need clarity as an audience member," Rogers shared. Managing the interplay between the imperatives of "clarity" and experimentation falls to the work of choosing correctly.

The radical refusal to choose – which would be at odds with the productive work for which he was hired, as well as the tenets of mainstream editing – would plunge the project into incoherence. A refusal to choose is what fractures the mind of EVERYTHING EVERYWHERE's nemesis, Jobu Topaki, for whom "everything is just a random rearrangement of particles in a vibrating superposition." The film tells us that Topaki is an "agent of chaos," whose mind was "broke[n]" after being put "under a lot of stress"; she was "pushed too hard" to verse jump; now that's all she can do. Jobu Topaki's

"broken" brain is formalized by Premiere Pro's resplendent effects, which seem to push montage to new extremes without breaking the program or the film. Spectacular sequences that feel like an exhaustingly endless surfeit of realities from which a mind can no longer choose are in fact the exhaustive products of an editor making ever-greater numbers of choices.

Because of the relatively low cost and ease of use, the conditions of digital filmmaking – including multi-camera filming, multiple retakes, and digital storage – have caused the amount of footage captured during filming to far exceed the ratios of use that defined the analog era. Contemporary editors, writes Meraj Dhir, are burdened with "an overwhelming amount of footage to choose from" (Dhir 2016, 161). For one episode of the TV show Survivor, editors had the "responsibility of distilling approximately 250 hours of raw footage down to one hour of onscreen programming" (Handel 2014). If digital productions overload editors, it is in part because of programs like Adobe Premiere Pro. This overload, disavowed by euphoric discourses of ease, dematerialization, and infinite choice, is what is inscribed in Everything Everywhere's timeline. The many green flecks that make up the timeline in Adobe Premiere Pro are each the mark of a human intervention – of a tactile gesture made by hands, neck, and eyes – made by the film's editor(s): a history of human choices.

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About the Author

Kartik Nair is Assistant Professor of Film Studies at Temple University, Philadelphia. A scholar of popular cinema, Nair explores the material life of genres by researching the infrastructures that produce moving images, and how viewers experience those infrastructures as expressive screen forms. His first book, *Seeing Things* (University of California Press, 2024), is about horror films made in 1980s Bombay. Nair's writing has appeared in the *Journal of Cinema and Media Studies*, *Film Quarterly*, *Discourse*, *Quarterly Review of Film and Video*, *BioScope: South Asian Screen Studies, Los Angeles Review of Books*, and *The New Inquiry*.

PART VI

Digital Humanities

15. Streams, Portals, and Data Flows: Digital Infrastructures of Film Studies

Malte Hagener

Abstract

This chapter takes a perspective broadly borrowed from infrastructure studies and examines the structural ramifications of film studies. After discussing the effects of the digital and the recent turn to infrastructure in media studies, the main body of the text is devoted to sketching how these transformative movements are affecting film studies. The focus is on access to film and on metadata that are being generated in basically every digitally based operation. The chapter also discusses "sampling" as a theoretical concept and the value of collaboration before turning to the individual, collective, and political possibilities that scholars have at this point in time.

Keywords: infrastructure, film studies, digital tools, digital humanities, streaming, critical data studies

The cinema, it has often been claimed, is a technology of the nineteenth century. It was based on advances in mechanical and photo-chemical engineering and it worked without electricity or other direct power sources (beyond the human operator on the crank) when it came into existence. Therefore, the cinema was able to function relatively autonomously.[1] A steady stream of technological novelties and innovations – editing, improvements in camera technology and mobility, color, sound (synchronous, stereo, Dolby, Atmos …), special effects, 3D, the digital, to name but a few – accompanied the further development of the medium, which grew increasingly dependent

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[1]   For recent important contributions to this debate see Turquety 2019; Elsaesser 2016; Albera and Tortajada 2015; Huhtamo and Parikka 2011.

on larger infrastructures. Many of these infrastructures are not exclusive to the cinema and are shared with larger social formations: the electricity grid, the railway and road system (for the distribution of prints), the mail and telephone system (for the coordination of production and booking), or the internet (for basically everything from informal communication to receiving keys to decrypt Digital Cinema Packages, or DCPs). Some of the infrastructures are specific to cinema such as the standardization of formats (from 35mm to VHS and DCP), labs and post-production facilities, or international agreements on sound technology. What should already become apparent here is a double assumption that underlies this chapter: infrastructures are combinations of material objects and social practices, while the digital is only one step in a longer evolution of technologies that have brought with them as a collateral effect a stronger reliance on infrastructure.

While I take a perspective broadly borrowed from infrastructure studies in this chapter, my main focus will be on my own discipline, film studies. After discussing the ramifications and effects of the digital, I will briefly give an introduction to the recent turn to infrastructure in media studies. The main body of this chapter will be devoted to sketching how this transformation is affecting film studies. I will concentrate on access to film and on metadata that are being generated in basically every digitally based operation. I believe that we are making individual and collective choices that have consequences for the environment in which we are operating.

The Digital Transformation – From Digitization to Digitality

When you follow the general press and listen to talks of politicians or university administrators, one of the constant buzzwords you hear is "digitization." The term is hardly new and has been around for the past two decades, but with the growth of the platform economy, the widespread adoption of mobile devices, and the impact of the COVID-19 pandemic, it has become ubiquitous. For some, "digitization" is a sort of holy grail and a utopian promise in itself; to others it is a threat of unfathomable size and an imminent danger to Western civilization. Of course, media historians know that new media are, in most cases, equally greeted by promises of liberation and progress on the one hand, and by predictions of imminent doom and disaster on the other – and, as is so often the case, the truth is in the middle.[2] I do not want to downplay the historical significance of the

2   See the classic study on the introduction of the telephone and electricity, Marvin 1988.

digital, but I believe that the discussion needs to be reframed in order to be productive – and we should start with the name we give to the phenomenon. The term "digitization" implies a process that is technological in nature, an outward change of format with a clear beginning and clear endpoint which does not impact the "content" or "signal" in any significant way.

A short etymological digression is in order here: The suffix "-ization" refers to processes in which persons or objects are brought into a specific state. "Privatization," "sterilization," or "financialization" are examples in which a clearly delineated object (for example: a school, a bottle of milk, or the health sector) becomes something else in one – and only one – specific sense (private, sterile, or financial, in these cases). For "digitization," the implication is of a threshold we have to cross in one respect, and once we have crossed it, we are inside the digital realm for good. Put differently – the term "digitization" implies that we are dealing with a process that has a clear beginning (analog) and a clear endpoint (digital).[3] It appears, moreover, to be a process that is mainly technological, so we just need the right tools such as good WiFi connections, new tablets, and licenses to the right software (if you think of schools and universities). I believe that the challenges of the digital are broader and much more diverse, because the term describes a transformative process in which the technological operation is just the smaller part. The digital allows for new forms of production and distribution, novel ways of circulation and appropriation, diverse ways of reception and storage, so the transformative dynamic is both all-encompassing and sweeping, but also subtle and miniscule. The digital world is not the old world in which everything has been digitized (i.e., put on a scanner and turned into a digital copy of itself), but it is a transformed world with an equal measure of continuity and rupture. This is why we need to think of "digitality" (the term I prefer) not as a threshold that we step over, but as a paradigm shift in the way that Thomas Kuhn (1962) has used the phrase, because the digital is in its effects so pervasive and intrusive that the thought of a merely technological process is reductive. Consequently, taking digitality seriously does not mean to simply step across a threshold, but implies a continuous transformative movement that affects many aspects of our operations.

On the one hand, as I have just argued, we are undergoing a transformation that is profound and shakes the very ground that we are moving on. It is a truism by now to say that the digital with its many consequences and ramifications is not only changing the way moving images are recorded and

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3   Another unspoken assumption, which I do not have the space to unpack here, is the categorical distinction between analog and digital; see Schröter and Böhnke 2004.

stored, but also impacting film culture in a pervasive and all-encompassing manner. The digital networks and the constant connectivity of the internet, the instant feedback and the algorithmic manner of compiling content, the data traces left by all activities and the consequences this has, the automatic supervision and control of many processes … the list goes on and on. All this is transforming film (culture) as a complex system that ultimately goes far beyond the (slightly fetishistic) question of whether a film is projected as an analog 35mm print or as a DCP.

On the other hand – and this might sound paradoxical after what I have just claimed – the transformations are not that far-reaching, if we take another perspective.[4] In this view, film is still produced in a similar way and continues to be used for a number of different purposes, from entertainment to education. The way audiovisual artifacts tell stories still adheres to classical models of dramaturgy; lighting and editing still have to take into account the human faculties of (re)cognition, while economic logics of production and distribution continue to be decisive in a capitalistic society. Instead of debating the somewhat moot point of how pervasive the transformation is (the answer is, as so often: it's complicated), we should rather look into specific aspects of what is going on.

Infrastructure and Technologies, Formats, and Standards

Infrastructures are heterogeneous ensembles of elements that provide a broad basis for further operations. As one important anthology defines it, infrastructures are "situated sociotechnical systems that are designed and configured to support the distribution of […] traffic" (Parks and Starosielski 2015a, 4). Traffic can be understood literally, when we talk about cars and trains, but it can also denote the way information spreads inside a network. Through their ubiquity and relatively frictionless operation, these large-scale systems tend to become invisible. Infrastructure provides access to basic services and operations (think of water, electricity, transportation, telecommunication, etc.), thus serving as a precondition for the smooth functioning of other, higher-order systems. In recent years, a new research field – infrastructure studies – has emerged at the intersection of sociology, workplace studies, science and technology studies, ethnography, and media studies. The increased interest in infrastructure as an object of research

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4   A nuanced understanding of historical analogies with a call for a measured approach to continuity and rupture can be found in Gordon 2020.

might be due to the realization that we are more and more dependent on the functioning of layers of infrastructure that are complex and mediated in nature. The work of Nicole Starosielski, Lisa Parks, Susan Leigh Star, Lisa Gitelman, John Durham Peters, and Maria Eriksson has been important and influential in various ways for the development of the concept in our field.[5] This critical turn toward the material, social, cultural, and economic foundations of media ecologies is highly welcome and has proven to be very productive. At its core, the study of infrastructure is meant to highlight aspects that have remained largely invisible so far because they have been taken for granted.

As just mentioned, anything that becomes infrastructure tends to turn invisible no matter how complex it is – in everyday usage, we do not think about the electrical grid and water from the tap, WiFi and the complexities of packet switching on the internet. It is usually only in times of breakdown or in places with unstable infrastructure that we become aware of those heterogeneous networks of technologies and routines, of people and practices. Often, infrastructure studies is less interested in seamless functioning than in the unruly commingling of material practices, technology, and discursive framings (Henke and Sims 2020).

Before we start, a word is due here on the distinction or congruence between technologies and infrastructures, between standards and formats – where do they overlap and how can we distinguish between them meaningfully? My contention is that the answer, as so often, depends on the perspective. Sometimes technologies turn into infrastructure and vice versa, even though technologies becoming infrastructure, the fading into non-visibility, is the usual mode of habituation. Standards are results of (complex) negotiations between stakeholders and often sink into infrastructural elements, as when specific configurations are built into technologies, while "formats represent the necessary forms of structuring and delivering media that coordinate between infrastructures and users" (Volmar, Jancovic, and Schneider 2019, 7). I see technologies, standards, and formats all situated in the infrastructural field, but each term has a different focus. My claim is that both the cinema as well as film studies are becoming more complex and are, as a result, relying more heavily on infrastructural ramifications. Therefore, we need to take infrastructures (and their implications) into account, not as an add-on or a special topic, but as a central element of our thinking about the digital present.

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5   Some of the more influential titles are Starosielski 2015; Parks and Starosielski 2015b; Parks 2005; Star and Griesemer 1989; Star 1999; Gitelman 2014; Peters 2016; Eriksson et al. 2019.

When turning attention to my own discipline, the study of film, a different set of infrastructural technologies come into view – those of institutionalized academia. Beyond general academic structures (e.g., libraries and journals, peer review and tenure processes, learned societies and conferences, degree courses and certificates), there is also a set of infrastructural elements specific to our field: film archives and editing tables, VCRs and DVD collections, but also shot protocols and "unbiased samples," assumptions about genres, and theories imported from other fields. With the comprehensive implementation of the digital, both the technologies and infrastructures of the cinema, as well as those of film studies, are changing dramatically. The question is what happens to film studies in the process of the digital transformation. Since digitality is not only reordering our everyday world, but also many aspects of the academic ecology, we have to think about the impact on the way we do our research. The process of adapting and shaping the environment – the very infrastructure necessary – for digital film studies is well under way. Some of the pertinent elements are: data collections, search engines, digitization projects, portals of cultural heritage, databases, online journals, and development of tools.

Streams Are My Reality – On Access and Availability of Films

One of the early technologies of film studies was the editing table, not as a machine to actually (re-)edit a film, but as a tool for watching a film when no cinema or screening room for projection was available. This manner of accessing a film came with its own set of problems, many of which are still relevant today (Bellour 1975). It required direct access to copies and tools, as well as expertise to operate the editing table, and it meant that the actual film was as fleetingly present as in the cinema auditorium, even though stopping and rewinding the film were possible. The film thus remained out of permanent reach for the scholar working on a specific title. The VCR and the DVD were technologies that allowed the possession of films and (more or less) permanent access.[6] The growing number of for-sale data carriers and the increasing number of TV stations available to record films meant a rapidly expanding access to film (and other audiovisual forms) which supported the growth of the academic discipline from the 1980s well into

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6   For a scholarly evaluation of this brief historical moment, see Benett and Brown 2008 (especially chapter 9, "The Possessive Spectator") and Klinger 2006.

the twenty-first century.[7] In fact, the availability of (a larger number of) films was a crucial precondition for film studies, a discipline in which close aesthetic analysis remains one of the key methods.

The widespread adoption of (legal, semi-legal, and illegal) streaming in the 2010s had as its collateral effect the crash of the DVD market. DVD sales peaked in 2005 and have since declined by about 90 percent, mostly replaced by streaming and to a lesser extent by video-on-demand and digital sales. Within a few years, streaming has established itself as the new "normal" for watching audiovisual content.[8] While there was hope in the beginning that this could lead to a wider range of material becoming available in the process because digital shelves are so much cheaper, the proverbial "long tail" did not materialize and the reality has proven to be bleaker than anticipated.[9] There is hardly any historical material (films older than twenty to twenty-five years) or non-mainstream content available through the major commercial streaming sites (Netflix, Amazon Prime Video, Apple TV+, Disney+), a situation that is not expected to change anytime soon.[10] Simply put, it is too complicated for the big portals and platforms to deal with the complex rights situation; it appears to be easier for them to produce their own content. Even a platform such as MUBI, which directly targets cinephiles, exhibits a logic of the revolving catalogue and of artificial scarcity – whether this is an intended strategy or a collateral effect of the copyright business remains an open question (Hagener 2016).

For film studies, this situation of complicated access to the material is not new, but it continues to have serious consequences (Hagener and Kammerer 2020). How do we make films available for groups of students without coming into conflict with copyright? Can we stream content to a whole auditorium? How can we be sure that the films we are studying or teaching will still be available tomorrow, next week, or next year when we no longer own a physical copy? How can we build a meaningful collection? Even though the longevity of DVDs in a material sense is still uncertain, physical media might be the best option to guarantee access to specific titles for a longer period of time. There are, of course, other solutions and options available online and offline, such as shadow libraries that operate on the verge of

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7   Of course, film studies existed before DVDs and VCRs, mainly with collections of 16mm films, but the institutional prerequisites were high and difficult to establish.

8   For an early consideration, see Holt and Sanson 2014.

9   For the original formulation of this naively optimistic Californian vision, see Anderson 2006.

10   For relatively early, but still valuable evaluations of Netflix, see Lobato 2019; and McDonald and Smith-Rowsey 2018.

legality or quite openly outside the law. Apart from the popular torrents that usually concentrate on big-budget filmmaking and that operate for a (illegal) profit, there are more specialized platforms dedicated to cinephile audiences and deliberately kept at a certain size in order not to attract too much traffic and attention (Kirsten and Schmidt 2017). Yet again, similar considerations of availability and longevity also apply here, so that many scholars build their own small archives of digital material on hard drives and other data carriers. Often, scholars share material within small circles of colleagues, but the question of confirmability and replicability remains open – especially if we think of different versions of films, but also if we consider the long-term availability of specific titles.

Various archives and other (semi-)official institutions have reacted to this situation by putting some parts of their holdings online. Many factors influence whether and in what way this is possible: financial means of institutions, legal rights within the national territory and concerning the material, policy of the institution, to name only the most important ones. Obviously, building an online repository for films requires substantial knowhow that differs from the expertise traditionally held in archives. Moreover, such an undertaking needs substantial resources not only for the construction, but also for maintenance and long-term storage, thus binding institutional energy that cannot be used elsewhere. Even if these preconditions are given, the legal situation – which is based on national law (copyright, fair use, exploitation rights, citation rights, etc.) – might prohibit some of the desired operations. Whereas the Danish Film Archive is in the process of making a large part of the silent film heritage of the country freely available to everyone online, in other countries the existing law does not allow such undertakings.[11] And finally, these decisions to make (certain parts of) their holdings available is always a choice with large implications for the visibility and status of specific ideas of what constitutes film heritage (of a nation, a company, or a social group) (see Brunow 2017). As so often, transparency about the processes and reasons for architecture, inclusion, exclusion, and operation is tantamount (see Dang and Strohmaier 2018).

Surveillance Capitalism, Digital Colonialism, Digital Sovereignty

This availability of film in digital form already pushes us outward toward a wider topic – the availability and control of the data being used in digital

11   See https://www.stumfilm.dk/en/stumfilm/about-us.

or mixed-methods approaches. Behind this question looms a much larger problem that is not particular to the scholarly community, but that takes specific forms here – the control over data in the increasingly digital environment that we navigate on a daily basis. What is at stake here is no longer just the access to this or that film and text, but rather the design and operations of the whole ecosystem in which we are existing. One crucial question is whether the scientific community will be able to shape and control the infrastructure that it operates on and in. Put differently: do we resort to an infrastructure that builds on Google Scholar and YouTube, on Dropbox and WhatsApp, on Scopus (owned by Elsevier) and academia.edu, that is, on privately controlled platforms that operate for profit, or will it be an infrastructure that is owned and controlled by scholars and public institutions? Will it be an infrastructure that privatizes profits or one that prioritizes collective actions and reciprocal bargaining?

Recently, two fundamental critiques of the way data are collected, processed, and used have been put forward, which briefly deserve our attention here. Shoshana Zuboff has characterized our present situation as one of "surveillance capitalism" (2019), while Nick Couldry and Ulises A. Mejias have argued for "data colonialism" as the right moniker for the state we are living in (2019). Both books agree on the overarching and nearly totalitarian nature of the latest stage of capitalist development, but diverge in their tone and points of focus. Zuboff concentrates on the nature of surveillance; she specifically helps us to understand how platforms utilize the "data exhaust," the metadata generated in any digital interaction such as loading a website or sending a text message, to create user profiles. These are, in turn, used for marketing and other purposes without the consent of the individuals to whom the data refer. Zuboff sees a new phase of capitalism inaugurated through the operation of the big players of the tech industry (Amazon, Apple, Facebook/Meta, Google/Alphabet, Microsoft).[12] They provide services that we, as consumers, can only use by handing over "our" data. As a consequence, we lose control over the ways in which the data are gathered and employed. We – or rather, the data that are being collected about us (by wearables and smart phones, by movement profiles and purchases, by internet searches and messages) – are turning into an exchange object that allows companies and institutions to address us as customers and clients, not as individuals and citizens.

In the case of infrastructure, ownership means having direct access to the data that are generated in the research process. As Petra Gehring,

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12   Of course, this is a Western view; then again, the big Chinese companies such as Baidu, Alibaba, Tencent, and Xiaomi operate on very similar models.

philosopher and historian of science, has warned, we might be facing "a systematic skimming off and exploitation of research actions in the digital realm" (Gehring 2021). The issue no longer only concerns costs for overpriced publications (which was for the longest time the key driver for the open-access community), but the fact that "big players tackle purposefully the integrity of scientific exchange. They consider the whole intellectual cycle of publicly funded, and therefore free, research as their future product" (Gehring 2021). The very core element of the academy is in danger, namely freedom of thought, freedom of expression, and freedom of research. The reason for this is that whoever owns the infrastructure in the digital era can basically control and monetize every single operation that we as scholars perform: search queries and downloads, duration of time spent on websites and usage of tools, cookies accepted and ad blockers used – such factors are constantly monitored, stored, and automatically interpreted. Gehring gives the example that during the online reading of one article in *Nature* about 70 tracking and profiling tools are at work on the user (2021).

While Zuboff sees a more or less radical break from former phases of capitalism, Couldry and Mejias stress the continuities with forms of extraction and exploitation. For them, it is not just more or less the same capitalism, but it is ultimately a form of colonialism that they see at work in the emerging networked environment. This concerns the "information flows that pass from human life in all its forms to infrastructures for collection and processing [..., as] data abstracts life by converting it into information that is stored and processed by computers and appropriates life by converting it into value for a third party" (Couldry and Mejias 2019, xiii). Just as historical colonialism appropriated land, resources, and objects, today's capitalism is appropriating data in order to turn this into profit for a very small group of people that gain from the systemic advantages. In both cases, the extractive process is rhetorically accompanied by a constant stream of stories about progress and civilization to bolster the glaring disparities inherent in the system. This "civilizing mission" masks the violence and infractions that the system is inflicting in order to make its profit. There are many more stories to be told about the imbalances of power and the different forms of exploitation, from the raw materials that are needed for the material basis of infrastructure all the way to the question of who is able to pay for open-access publication fees.[13]

Even though Zuboff and Couldry and Mejias disagree on some important aspects, especially how to understand the current situation from a historical

13   For recent important interventions in this field, see Crawford 2021 and Fraser 2022.

perspective, ultimately their dystopian views of our media ecosystem converge. The technological tools that are seemingly at our disposal are in fact tools of oppression and exploitation, which not only make us dependent, but are used to build data pools to which we have no access or knowledge of what they are used for. As a remedy to this situation, it has often been claimed that we need an increased control over data, which has been termed "data sovereignty" or "digital sovereignty," even though there is no definite agreement over how to understand these terms (Augsberg and Gehring 2002). While in political science sovereignty is often used with reference to larger units such as states, and in juridical discourse it has a specific meaning too, the idea of sovereignty implies a kind of self-determination, which would be an important step in our situation. Then again, this would entail legal transformations, a different model of operation for the platforms as well as an adjustment of practices – something that remains out of reach today.

Method

Data and infrastructure have become central elements of any research in the digital realm. In the perspective adopted here, data are not simply a resource that one uses and bends at will, as it is often seen in popular statements proclaiming data (or information) to be the oil of the twenty-first century. It would be equally naive, of course, to claim that data are not important, but we rather need to reframe the debate around data in a critical fashion. As Lisa Gitelman has famously proposed, and this has become something of a truism, "raw data is an oxymoron" (2014). In this sense, data are never given (as the term itself implies), but are always produced: data are harvested and groomed, mined and scraped, extracted and warehoused. It is no wonder that these metaphors concerning data come from the fields of agriculture and resource extraction, because work with data requires extensive investment in transport and storage, in technology and knowledge. If data are supposed to be useful, they need constant attention and specific conditions, but at the same time, they are not a neutral container of information. Just like the medium, the message is also the data, not just in the numbers or signs that they contain.

So, infrastructure and the material being processed – data – are important, but what we do with them is at least as important. This practice of research usually goes by the name of method. And here we should remind ourselves that, in some important ways, not that much has actually changed. In the humanities, we are still operating under the wide umbrella of hermeneutics,

trying to understand and grasp cultural phenomena that are complex, situated, and multi-sided.[14] So, even if we work on and with digital tools, we are still faced with many of the traditional questions of our trade: what is a reasonable research question; how do we build a meaningful corpus that is not biased by availability and popularity; which tools and methods are adequate for the question under consideration; and, most importantly, how do we interpret the data that we have gathered in the process of our investigation.

I believe that we will turn increasingly to mixed methods that integrate "traditional" modes of research with digital tools. The digital does not solve any problems by itself; we should not be afraid of the digital, but embrace it, use it for our ends, yet not hope for quick and easy answers. In many respects, digitality will make our life as researchers even more complicated because the more options become available, the more decisions have to be made. Yet, as far as complexity is concerned, it is not a simple sequence of steps (like an algorithm) to which one simply adds one or two. Instead, working with digital tools and larger data sets requires a different process of research. We have to think of this as an iterative process in which the development of a question, the building of a corpus, and the adaptation of tools have to be continuously adjusted every step along the way. We often have to go back to a step before because we realize that, for example, the corpus – which in digital processes often is much larger than a single person can survey – is skewed or biased in some way. Or we might want to try out a different tool for the same method in order to see whether we can replicate the results.

Johannes Passmann has recently described this process as sampling, a term that I find quite useful here: "sampling is not a self-contained step in the beginning of a research procedure (like the random sampling of quantitative research), but a continuous and reflected engagement with the empirical material, with the methods used in the research and with the conceptual developments" (2021, 131; my translation).[15] In this sense, I understand sampling as an iterative, open-ended, and reflective loop that is integral to the research process. As data become increasingly big, we often discover problems of gaps and contaminations while we work on them. Also,

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14   There is a wider issue here which I do not have the necessary space to discuss – how methods such as production studies, infrastructure studies, and digital methods are undermining the hermeneutic base of the traditional humanities.

15   "Damit ist das Sampling kein abgeschlossener Arbeitsschritt zu Beginn des Untersuchungsprozesses (wie etwa die Stichprobenziehung der quantitativen Forschung), sondern eine kontinuierliche und reflektierte Auseinandersetzung mit dem empirischen Material, den eingesetzten Forschungsmethoden und den konzeptuellen Entwicklungen."

digital tools are often complex and increasingly use machine learning, so that it is difficult (if not impossible) to understand how they come to their results. Accordingly, we need to constantly adapt our practice.

Besides "sampling" as a reflexive process, there is another aspect I want to highlight at least briefly, namely the function and value of collaboration. There is a persistent stereotype of the humanities scholar – a somewhat nerdy individual who spends most of his (this is still predominantly a male stereotype) time in archives and libraries or at home in his private study chamber. After many years of hard work, a book emerges which is an individual achievement, an opus magnum of singular ambition and endeavor. Of course, this image has never been true, but today it is becoming increasingly problematic because it implies something that we are in fact not doing, especially those of us who work in the humanities with digital methods. I believe that we have to actively develop new models of work and collaboration already in our teaching, but more strongly in teams with mixed sets of qualifications, different forms of expertise and diverse backgrounds. This raises issues of authorship and ownership, it challenges us to implement new ways of communication, and it also asks us to think differently about the forms of collaboration and the specific roles of individuals involved in the process. This concerns both the internal dynamics of a team, but it also implicates the wider academic ecosystem. Specifically, we need to think about how we value and evaluate tasks such as the production of data sets (or data papers), the cleaning and augmentation of such sets, the production of video essays and digital tools which have, so far, not been significant in academic procedures of hiring, promotion, or tenure. We also need to address questions of co-authorship which has long been the rule in other fields of the academy, but which is only now beginning to make inroads in the humanities.

Conclusion

Especially as media scholars, we know that media are never neutral carriers of meaning, but that they always affect the message, the messenger, and whoever receives the message in countless ways. The technologies we are using have a reciprocal effect on us, so that we shape the environment, which in turn shapes us. The (intended and collateral) effects of technologies, especially if they amalgamate into infrastructure and become partly invisible, are too significant to take them lightly. Technologies are never inherently good or evil, they always depend on an ecosystem and

infrastructures which are themselves created by human decisions and actions. Since we have built these systems, we can also change them, but it might take considerable time and effort.

If we take these developments seriously, we need to act on an individual, a collective, and a political level. On an individual level, we should be very careful about which services and platforms we are using. Sometimes it is very hard to navigate around them, but often there are alternatives available that minimize the use and abuse of data in transactions. We have to remind ourselves that we are constantly making decisions that have an influence on the ecosystem in which we are operating – which videoconferencing system are we using and which calendar tool, how we present our research (please delete your academia.edu account!), and which publisher we choose (Bond 2017). A lot of the platforms function better if many individual accounts are present and active, so using a specific platform has an effect on the whole system. Since (most) platforms do not offer any content or service themselves, but only provide the infrastructure for connecting nodes (persons, objects, information), they are reliant on third-party interaction. Also, through our behavior we are setting an example for younger scholars and a future generation about what is acceptable and desirable in our field. The culture of academic research is very much shaped by such micro-decisions.

Collectively, we should be working on larger infrastructure projects that are scholar-driven and provide alternatives to the big tech companies. These alternatives should subscribe to the principles of open science, and they should be transparent regarding which data are being collected in the process, what the purpose of such gathering is, and what happens to the data. We should be using learned societies and trade unions, informal networks and our university's governance systems in order to lobby for open access and open science on all levels. We should also be teaching in a way that is sensitive to these issues, using tools that are open source, while discussing the consequences of data capitalism and what it means to (not) control your own data. And finally, universities – and the whole field of research and education – have to play a role in the regulation of the digital economy, so that there is a political dimension as well. The ecosystem of the digital economy cannot be tamed on an individual and collective level alone; there needs to be legislation that makes control of data easier. Being aware of the consequences of individual choices and imparting this knowledge to students, acting collectively in constructing alternatives, while collecting the political will for intelligent regulation – these are necessary steps toward a more just and sustainable infrastructure of film studies.

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16. Six Memos for the New Millennium: A Dialogue with Andreas Fickers on Epistemic Virtues in the Digital Humanities

Annie van den Oever

Abstract

Taking Italo Calvino's *Six Memos for the Next Millennium* as a starting point for a conversation about the epistemic virtues in the Digital Humanities, Andreas Fickers and Annie van den Oever discuss a rejection of the normative tradition of honing an ideal-typical definition of what makes "good science" in favor of an exploration in the phenomenological descriptive tradition of epistemic norms (values) as internalized by scientists. They reflect on the six epistemic virtues that could be instrumental in prompting a new "style of reasoning" that combines the epistemological, political, and ethical dimensions of Digital Humanities practices in the global knowledge ecosystem. The Tokyo 2023 workshop on the "Integrative Potential of Epistemic Virtues in Digital Humanities" is a source of inspiration.

Keywords: epistemic virtues, digital knowledge economy, decolonization (of data/knowledge), distributed cognition, epistemic injustices, calculated inequality & data FAIRness

Inspired by the emerging digital media "in the so-called postindustrial era of technology," Italo Calvino wrote *Six Memos for the Next Millennium* (1988, 3). His work on the Memos took off in 1984, an ominous year in its own right due to George Orwell's utterly dystopian science-fiction novel *1984*. Contrary to Orwell, however, Calvino is expressing the *values* he so deeply cares for and wants to keep and think through within the realm of the new millennium. If anything, his lectures are optimistic. They explore virtues, not fears. His Memos are devoted to the six virtues he held dear.

In succession they were Lightness, Quickness, Exactitude, Visibility, and Multiplicity; had Calvino not passed away in September 1985, a sixth chapter would have been devoted to Consistency (E. Calvino 1988).

Lightness

Annie van den Oever (AvdO): It seems to me that in the rapidly evolving field of Digital Humanities (DH), a rethinking of research values, methodologies, and practices at the intersection of digital technologies and the disciplines of the humanities has become even more urgent today than at the start of the millennium. May I invite you, in line with Calvino's Memos, to speculate – in the French sense of the word – about the epistemic virtues and values you think are key to the field of Digital Humanities today? I am asking you as the director of the DH Lab in Luxembourg who has just returned from the workshop on the "Integrative Potential of Epistemic Virtues in the Digital Humanities" in Tokyo.

In the opening chapter on Lightness, Calvino sets the tone with a note on the second industrial revolution taking place so silently compared to the nineteenth-century industrial revolution that was brought about with heavy machinery:

> Then we have computer science. It is true that software cannot exercise its powers of lightness except through the weight of hardware. But it is the software that gives the orders, acting on the outside world and on machines that exist only as functions of software and evolve so that they can work out ever more complex programs. The second industrial revolution, unlike the first, does not present us with such crushing images as rolling mills and molten steel, but with "bits" in a flow of information traveling along circuits in the form of electronic impulses. The iron machines still exist, but they obey the orders of weightless bits. (1988, 8)

This is not Calvino's overture for a dismissive reflection on a revolution that has been pervasive and invasive far beyond his imagination. He stays clear of somber speculations about the future, of which there were already so many, to argue that lightness is a good thing and not only for literature: it helps the flow of information. But Calvino's broader claim is that if literature is to have any weight, it must have the virtue of lightness. Needless to say, at the end of the chapter *lightness* points at so many more things than at weightlessness and "bits" and computer transmission. Which epistemic virtues are closest to your heart?

Andreas Fickers (AF): Thank you for this invitation and for bringing Calvino to my attention. His lectures read as a journey into an unknown territory, which is inspiring. I think many of us scholars in Digital Humanities (DH) can relate to this, among them the group of colleagues assembled at the DH workshop in Tokyo.[1]

Let me start by clarifying what I understand by epistemic virtues. In their introduction to the history of the concept, Andreas Gelhard, Ruben Hackler, and Sandro Zanetti define them as "the skills and attitudes that certain discourse communities consider exemplary, if not obligatory, for the production, transmission, or acquisition of knowledge" (2019, 3). In the normative tradition of philosophy of science, epistemic values and virtues refer to ideal-typical definitions of what makes "good science" and how scientific evidence and arguments can be legitimated. Well-known epistemic values such as "objectivity," "truthfulness," "impartiality," "reproducibility," or "accuracy" have been central to the invention of modern science, as Isabelle Stengers argues (1993).

The phenomenological dimension of *doing science* has been discussed by sociologists and anthropologists of knowledge, for whom epistemic norms or values are internalized by scientists through the learning and perfecting of scientific practices (cf. Baehr 2011; Harman and Galison 2008). Knowledge production in their sense is always situational, embedding its own historicity and spatial rootedness. These practices make and define the "scientific self" of the different epistemic communities. The situatedness of Digital Humanities knowledge practices that we discussed during the workshop in Tokyo were inspired by this praxeological thinking of *doing science*, in part to highlight the "mangle of practice" in Digital Humanities knowledge production (Pickering 1995).

AvdO: Seen from this perspective, Digital Humanities is first and foremost the name for a new research practice?

AF: Yes. An intercultural contact zone for knowledge production in the digital age. And where different experimental cultures meet, knowledge

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1   Among them were the initiator and co-organizer of the workshop, Harald Kümmerle (German Institute for Japanese Studies); Kenji Ito (Kyoto University); Monica Berger (New York City College of Technology, CUNY); Anita Lucchesi (C²DH Luxembourg Centre for Contemporary and Digital History); Anat Ben-David (Open University of Israel); Alan Liu (University of California, Santa Barbara); Antonia von Schöning (Humboldt University Berlin); Emmanuel Ngué Um (University of Yaoundé I); and Asanobu Kitamoto (ROIS-DS Center for Open Data in the Humanities / National Institute of Informatics, Japan). For a brief description and the program of the workshop, see https://www.dijtokyo.org/event/the-integrative-potential-of-epistemic-virtues-for-the-digital-humanities/.

production depends on go-betweens and partially diverging interests and, often, unchecked power differentials. We hold that it is especially in these situations of creative uncertainty that epistemic virtues can provide orientation. They mold the scientific self. They are labeled "epistemic" because of their perceived relevance to the pursuit of a hermeneutics that helps to connect historical and present knowledge practices.

AvdO: You value uncertainty – what you call *creative uncertainty* – as a quality that enhances research. Can you give an example?

AF: Indeed. And typical for these practices, I argue, is a tension between epistemic values from the sciences and from the humanities and social sciences. These tensions – for example between the epistemic value of machine-based exactitude in the sciences and the epistemic virtue of critical subjectivity in the humanities – can be grasped through the concept of a "hermeneutics of in-betweenness," as put forward by Stephen Ramsey in his study *Reading Machines: Towards an Algorithmic Criticism* (2011). He suggests locating "a hermeneutics at the boundary between mechanism and theory" and he proposes to "channel the heightened objectivity made possible by the machine into the cultivation of those heightened subjectivities necessary for critical work" (Ramsey 2011, x).

AvdO: As you know, Tom Eyers (2013) discusses Ramsey and DH approaches to hermeneutics elaborately, and brings up some interesting points, but his take is rather polemical and broad. What is the element of *creativity* in creative uncertainty to you?

AF: Creativity is the "thinkering mode" of Digital Humanities work that informs a new hermeneutics of practice. "Thinkering" is the combination of critical thinking and practical, creative tinkering with new digital tools and infrastructures to explore digital corpora, to model and visualize complex knowledge graphs, and to reflect on the biases of datasets, limitations of tools, and political/economic power relations inscribed into large knowledge infrastructures (Lucchesi 2020). These practices are typically hybrid, moving between analog epistemic traditions and new digital interferences, mingling qualitative and quantitative approaches, close and distant reading of sources as data. This type of research is characterized by a workflow that seems more experimental and collaborative than in the past, and more driven by creative uncertainty.

AvdO: Could you name and describe the values and virtues that you deem new or specific for "doing" Digital Humanities?

AF: I would argue that current knowledge practices share a number of new epistemic values and virtues that are specific to the production, dissemination, and access to knowledge in the digital era. Concretely, I think about values and virtues such as sharing, collaboration, participation, transparency, openness, sustainability, traceability, and what is referred to by the acronym FAIRness.

During the discussions at the Tokyo workshop, a number of additional values and virtues were brought to the table: probability, approximation, infrastructural justice, digital sovereignty, partial understanding, distributed accountability, shared responsibility, decolonization (of data/knowledge), bibliodiversity, distributed cognition, epistemic and hermeneutic justice, and calculated equality.

These values demonstrate that we do not only speak about epistemological values and virtues in the strict philosophical sense, but also more broadly about the political dimension of scientific virtues. And we need to face the vices of the digital era too, such as infrastructural injustice, calculated inequality, and epistemic and hermeneutic injustice.

AvdO: Yes, we must discuss these vices in more detail. But before we do, may I ask you to return to the collaborative work being done by what I imagine are interdisciplinary, international, and diverse groups of researchers: are they?

AF: Indeed, the community of practice of Digital Humanities scholars is very international and diverse and their collaboration typically shows what Julie Thompson Klein calls *deep interdisciplinarity*: there is a transfer and exchange of methods, tools, concepts, and techniques across different disciplinary traditions (2015). Yet these epistemic differences necessitate constant negotiation in the trading zone (Collins, Evans, and Gorman 2007). Ideally, this leads to interactional expertise, to the creation of a common language, and to shared authority. In reality, though, there is not a full but a partial understanding. In at least some interdisciplinary settings, it seems possible "to share a local understanding of an entity without sharing the full apparatus of meanings, symbols, and values in which each of us might embed it" (Galison 2010, 44). All this seems typical for the more experimental, explorative nature of Digital Humanities work, where computer scientists, data analysts, library and information scientists, human-computer-interaction specialists, and a great variety of disciplines from the social sciences and humanities meet.

AvdO: And these encounters between different disciplines and skill sets foster uncertainty?

AF: They certainly do. Yet uncertainty as a state of mind also fosters epistemological reflections about the nature and evidence of scientific work – and about the values and virtues that underpin our self-conception as academics and scholars. However, not everybody experiences the unsettledness of truly interdisciplinary work as intellectual excitement. While some embrace the multiperspectivity and multivocality of collaborative work in the trading zone, others feel rather uncomfortable and prefer to stay within their disciplinary or epistemic comfort zones. Without intrinsic motivation to engage in inter- or cross-disciplinary work, no new learning is possible – not even in a laboratory space as an environment designed for such a purpose (Fickers and Van der Heijden 2020).

AvdO: I would like to return for a moment to "thinkering" as a method known from the field of media archaeology (Huhtamo 2010). There, it was initially modeled after or at least associated with the skillful and artful experiments by artists who combine exquisite knowledge of their tools – *technē* in the classical sense – with a certain lightness and playfulness in their approach, allowing an amount of uncertainty about the outcomes so untypical of the sciences (at least until recently). To me, "thinkering" is associated with the virtue of lightness, so let me return to Calvino for a moment. Probing lightness from every possible angle, he himself is certainly playful, capricious, quirky, idiosyncratic, and unafraid to create leaps into unknown territory, with an open eye for sudden moments of wonder and beauty. What interests me most here is how his approach is affirmative, and how artists' practices more generally tend to favor something playful and energizing. Would you say that the thinkering practices you were talking about form a useful model for what is perhaps a typical early phase of affirmative reinvention in the Digital Humanities? I am hesitant to talk about an affirmative turn, more broadly, though some thinkers seem to point to such a turn, among them Bruno Latour (2004), Sarah Ahmed (2012), and Rebecca Solnit (2023).

AF: I sympathize a lot with Calvino's affirmative take on lightness as it emphasizes the importance of curiosity and wonder, which are essential for philosophical thinking. The creative and explorative element in the cognition process is close to artistic or cultural practices that have also been described as epistemic practices of bricolage. But whereas the concept of bricolage as introduced by Claude Lévi-Strauss ([1962] 2009) emphasized the similarity

of technical and mythical thinking in terms of their experimental and unpredictable nature, the term "thinkering" points at an ethos that is indeed playful and hands-on, and energizes the exploration-based interaction between the researcher and the multiple digital research infrastructures and tools that form today's knowledge ecosystem.

The fact is that most DH research is the result of collaborative thinking, often occurring in a laboratory setting in which multiple stakeholders participate: archives, cultural heritage institutions, coders and developers, data stewards, web or interface designers, and computer/data scientists, as well as humanities scholars. Following Hans-Jörg Rheinberger, one could argue that the "experimental system" of DH is tech-driven and characterized by its data-driven nature (2021). In addition, many DH projects deal with research objects that, due to their sheer scale, transform "how we think" (Hayles 2012; Armaselu and Fickers 2024). Scale has an impact on the project design and architecture, and on the methodological and analytical frameworks applied; and it fosters debates about epistemological questions such as "evidence," "objectivity," "traceability," and "transparency."

AvdO: Could you perhaps give an example that helps us understand how DH deals with questions of scale?

AF: A good example would the Impresso-project that the Luxembourg Centre for Contemporary and Digital History (C²DH) is doing with data scientists from the Swiss Federal Institute of Technology (EPFL) in Lausanne and computer linguists from the University of Zurich.[2] This project, based on a large dataset consisting of digitized Swiss and Luxembourgish newspapers,[3] draws attention to the ways in which historical research on "big data of the past" challenges classical forms of media history by facilitating the "scalable reading" of historical sources.

By combining tools for the "close reading" of single newspaper pages or articles with the "distant reading" of the corpus using tools such as text-mining, topic-modeling, and visual pattern recognition, the Impresso

2   For a general description of the project, see the project website; https://impresso-project.ch/, watch the video; https://impresso-project.ch/overview/intro, or explore the app; https://impresso-project.ch/theapp/about/.

3   Currently the dataset consists of 76 newspapers (Lux and CH), 600,919 issues, 5,429,656 pages scanned, 3.4 million images/12.5 billion words. The follow-up project (Impresso II) has just started and will enrich the collection with further newspapers from Western European countries and add audio sources (from public broadcasting stations) to the corpus in order to enable multi-media historical research (text, audio, images).

interface enables historians to apply their method of source criticism to a digital corpus by combining methods of historical data criticism with an analysis of the representational integrity of the facsimile version (Düring et al. 2021).

The interface is also an example of the "inscription" – in the Latourian sense – of theoretical reflections on digital hermeneutics into the "materiality" of a research interface, thus promoting the epistemic virtues of transparency and traceability in DH research (Fickers and Tatarinov 2019). Lastly, it is an example of what Katherine Hayles has called "multimodal scholarship": a collaborative effort that requires intellectual curiosity, methodological flexibility, and a constant negotiation of boundary objects (2012). I guess this is close to what Calvino described as lightness – a willingness to experiment, to learn by doing, to embrace the virtue of curiosity for the benefit of accuracy or exactitude.

Quickness

AvdO: In his chapter on quickness, Calvino explains he has always been fascinated by fairytales and folktales, because of what he calls the rhythm in which they unfold, and their hard logic, laconic but with the greatest possible narrative force. Does the virtue of quickness speak to you?

AF: Calvino's virtue of quickness resonates strongly with one of the most central topoi of modernity at large: the phenomenon of "acceleration." The "cult of speed" runs like a red thread through the discourse of modern life – indeed, acceleration could be interpreted as the "temporal condition of modernity" (Rosa [2005] 2013). Digital technologies are just the latest newcomer in a long history of communication technologies and media that symbolize modernity and globalization.

AvdO: Do technologies add the experience of acceleration to so-called modern life, the train, car, and plane no less than the digital technologies of these last decades?

AF: Sociologists and historians alike have emphasized the intrinsic relationship between social structures and the perception of life's tempo at specific moments. The impact of changing transport and communication technologies cannot be overstated here and has basically three dimensions: first, in terms of people's routines, rhythms, and habits; second, regarding the horizon

of expectation for their private lives as a whole; and finally, concerning the imagination and discourses of their generation. All three are interwoven and, in a complex process of individual and collective synchronization, define the "being in time" of historical actors. These three dimensions can – in times of rapid technological, social, cultural, scientific, or political change – get "out of sync" and thereby produce feelings of insecurity, alienation, and conservatism, or alternatively moods of enthusiasm, visionary excitement, and revolutionary hope (Fickers and Griset 2019, 332-367).

AvdO: Have digital media fundamentally restructured our relationship to time?

AF: I do indeed think we are dealing with a new "temporal regime" in the age of digitality and I have argued so on different occasions (Fickers 2022). Historians and cultural scientists such as François Hartog and Aleida Assmann argue that we live in an age of extended, even voracious simultaneity; a new "chronotopos," according to Assmann (2013, 277). Hartog speaks in a less neutral way of "[u]n présent monstre," an extended presence "that pulls everything into its maw [...] and destroys not only the difference of times, but also historical consciousness" (Hartog 2012, 270).

AvdO: I am also thinking of Hans Ulrich Gumbrecht's notion of a "broad present" (2014). But by speaking about the "maw" of the "monster," Hartog invites a psychoanalytical reading of our digital devices along the lines of Little Red Riding Hood and the Big Bad Wolf. But it seems that Digital Humanities scholars have not really made Freudian analyses of the impact on our imagination. One of the few exceptions is Kriss Ravetto-Biagioli's *Digital Uncanny* (2019; see also Sconce 2019); she argues that they disrupt our concept of "self" and transform the meaning of the uncanny that Freud tied to a return of repressed memories.

AF: I think that digital media technologies shape our imagination of the past as much as they affect our current memory practices. While scholars like Andrew Hoskins (2018) or José van Dijck (2007) recognize in hyperconnectivity a new culture of mediated memory in real time, Victor Mayer-Schönberger interprets the digital age as a temporal regime characterized by mass forgetting: "Committing information to digital memory has become the default, and forgetting the exception" (2009, 196). It is indeed a tempting and thought-provoking idea to consider "forgetting" as a specific virtue of our digital temporal condition.

AvdO: Do you mean that forgetting (or deleting) is a virtue in an era of information overload?

AF: The abundance of mediated memories inevitably creates the need for forgetting as a precondition for an open future. I am thinking of Paul Ricoeur and his reflections on the intrinsic and complex relationship between remembering and forgetting, and it seems to me that his concept of "oubli de réserve," reserved to be forgotten, exactly covers the allure of the sociotechnical imagination of the cloud to keep track of all the traces of our digital condition (2000, 539ff.). Aleida Assmann understood archiving along similar lines as a form of "Verwahrensvergessen," save to forget, to free our minds for decision-making in the present (2016).

In archives, our memory objects exist in a status of latency, in between a "no longer" and a "not yet." They pause in the waiting room of history. Interestingly, most people producing large private digital archives as non-experts really have no clue how to manage, curate, or conserve their digital collections. Keeping them on an external hard disc is a form of "Verwahrensvergessen" par excellence. The storing is driven by the naive hope that somehow somebody will be able to unearth this treasure of private memories in the future – yet I would be very skeptical about such promises.

Exactitude

AvdO: Earlier you spoke about the tensions between the epistemic value of machine-based exactitude in the sciences and the epistemic virtue of critical subjectivity in the humanities. Could you say a bit more about the tensions between the two? What is the tolerance to what you called *creative uncertainty* in the (human) sciences, given the values of exactitude, evidence, transparency, and reliability of knowledge? As you know, Calvino turns negative and even pejorative notions into something we like and embrace. He does so too with one of the big horrors for scientists: not being precise or exact, not being clear, being vague. I am referring to his chapter on "Exactitude," where he quotes Giacomo Leopardi, who claims that language becomes more poetic the *vaguer* it is. Calvino adds in passing that "Italian is, I believe, the only language in which the word for 'vague' (*vago*) also means lovely, attractive" (1988, 57). Is there, in your view, something attractive and charming to this? Or is exactitude the only real friend of the sciences?

AF: This is an excellent question as it brings us to the core of a longstanding debate in the history of sciences and the sociology/philosophy of knowledge. Exactitude or similar terms such as precision, accuracy, fidelity, or meticulousness are indeed closely associated with the idea of modern science, especially the "hard" sciences, or "sciences exactes" in French. But, as Markus Krajewski has argued, these virtues of exactitude are a rather young phenomenon in the long history of epistemological reflections about what good scientific practice means (2016). They only emerged after the French Revolution and can be interpreted as signs of the nineteenth-century quest for universal standards and precision measurement. Pushed by emerging disciplines such as metrology and engineering, exactitude not only became an epistemic value of the modern, technoscientific condition, but also a "hard" criterion in disassociating "Naturwissenschaften" (sciences) from "Geisteswissenschaften" (humanities). It was Wilhelm Dilthey who helped to construct the epistemic modus of the so-called hard sciences as "explaining," whereas the humanities aim at "understanding" ([1910] 1981).

AvdO: Would you say that the Digital Humanities share the ethos of exactitude and perceive themselves as a "measuring" science?

AF: As Antonia von Schöning argued during the Tokyo workshop, the relation of the Digital Humanities to exactitude is more complex and nuanced. The recently published *Encyclopedia of Exactitude* is illuminating in this respect as it offers a multitude of concrete examples and case studies showing that the virtue of exactitude has not only affected scientific thinking in the hard sciences, but was appropriated and reflected in the humanities too, albeit in a different, less "mechanical" or "measurable" sense (Krajewski, von Schöning, and Wimmer 2021). Interestingly, the *Encyclopedia* reframes the virtue of "erudition," so typical for humanities scholars, as the result of a long process of socialization and incorporation of the habitus and standards of exactitude through academic reading, annotating, excerpting, reformulating, and writing, thereby following the "rules," "protocols," or "best practices" of the respective discipline (Martus and Spoerhase 2022). Several "big humanities" projects (e.g., the Corpus Inscriptionum Latinarum or the Thesaurus Linguae Latinae) were combined efforts in promoting the scientific virtues of accuracy and thoroughness that formed specific academic characters or personae not unlike the ones in big science today (Eskildsen 2016).

Despite such practices of exactitude in the humanities, they operate with a greater interpretative flexibility than the sciences. Krajewski even reminds us that the virtue of exactitude – when turned into an absolute canon – has

the tendency to revert into the epistemic vice of pedantry, a form of excessive precision killing any creative act of speculative thinking (2019). A certain vagueness or uncertainty is therefore to be understood as a productive element in the process of cognition and critical thinking. It is exactly in this space of blurred cognition that the scientist is able to co-construct a new epistemic object and to produce new insights and knowledge in a process of heuristic groping (Rheinberger 2015).

Multiplicity

AvdO: Calvino devotes his last big chapter to the virtue of multiplicity as embodied by "the Italian James Joyce," Carlo Emilio Gadda. Labeled by others as the creator of "deliberate disharmony," Gadda is described by Calvino as a writer who "developed a style to match his complicated epistemology," one in which details take center stage. "[O]ften the outline is lost while the details proliferate and fill up the whole picture" (Calvino 1988, 106). To Gadda, an engineer by training, the knowledge (of things) is "the convergence of infinite relationships, past and future, real or possible" (Calvino 1988, 107). Unlike authors with a different vision and intellectual training, and a different personality, Gadda put multiplicity at the heart of his epistemology and his style. In Calvino's words,

> He tried all his life to represent the world as a knot, a tangled skein of yarn; to represent it without in the least diminishing the inextricable complexity or, to put it better, the simultaneous presence of the most disparate elements that converge to determine every event. (1988, 106)

I am not sure if Calvino's metaphor of the knot speaks to you. He also calls the knot a "grotesque drollery" (Calvino 1988, 107). That metaphor also struck a chord with me as it suggests that Gadda is like a monk who draws drolleries, tiny decorative grotesque figures, in the margins of a manuscript. There is "too much," but it is wonderful and it is playful and it is fun. But Calvino is also making the point that such knots, like drolleries, create a tension between the center and margins. All this is directly connected to the merits of Gadda's epistemology-of-the-multiple. At the heart of it there is an acknowledgement that "observation intervened in some way to modify the phenomenon being observed" (Calvino 1988, 108). Or, in Gadda's own words: "to know is to insert something into what is real, and hence to distort reality" (quoted in Calvino 1988, 108).

AF: Calvino's reflections on Gadda's style, especially his speculations about the metaphor of the knot, evoke the image of network visualizations so prominent in DH research. Modeling the relationship between a great number of "actors" in a complex network aiming at identifying nodes, or visualizing the centrality or periphery of certain actors in the network creates a new "tension between center and margins" as you framed it. In manipulating data from multiple resources, modeling their relationships, and thus exposing facets hitherto unrealized, we become actively involved in the co-design of our epistemic objects; we "move from simulation to simulacra," says Jim Mussell (2013, 91).

Dynamic network visualizations, deep mapping technologies, or multilayered chronologies that characterize current transmedia narratives in digital history projects come with knots or nodes – and with a new aura of simultaneity that challenges our linear conception of history. Alan Liu describes interactive interfaces – based on relational databases filled with millions of sources – as symbols of a new model of (networked) knowledge, which he labels as "hypergraphical knowledge," "multiperspectival and multiscalar" by default, "distributed in its foci and relations, and (connecting all the disparate nodes and levels) ultimately networked" (2018, 73). In this way, the "epistemology-of-the-multiple" is being written into the code of CMS or Multi-Media-Asset-Management-Systems of large digital archives and online cultural heritage repositories and, as a result, such databases offer to their users a multitude of readings, narrative perspectives, and interpretations (Anderson 2011).

Fairness

AvdO: Let us move to Fairness now. It is a virtue not mentioned in the Six Memos but a quality that you have raised yourself at the beginning of our dialogue, where you spoke about the virtues subsumed under the acronym "FAIRness" by the DH community. What is meant by it? Is that not subsumed under Multiplicity – in this case the multiplicity of voices marginalized by digital practices?

AF: Literally, FAIRness refers to the virtues of findability, accessibility, interoperability, and reusability, and they of course resonate with the sociotechnical imaginaries of big data, hyperconnectivity, and artificial intelligence. However, the steep career of the "label" FAIR in Digital Humanities rather stands for a momentum of critical self-reflection in the field. The

so-called third wave of DH is characterized both by a stronger hermeneutical reflection on what the "D" does to the humanities more broadly (Fickers 2022), and by a more straightforward discussion about the political economy of digital knowledge infrastructures from a postcolonial perspective. While prominent pleas for open access (OA) and open science were generally spiced by the rhetoric of the democratization of knowledge, we know now that this fairytale of OA as the great equalizer remains largely a Western promise and project. In practice, the implementation of OA in academia in the Global North instead solidifies inequities in scholarly communication, as it largely makes the proprietary structures of established publishers even more manifest, and does not bring about the desired "change regarding epistemic injustices," as Marcel Knöchelmann has argued (2021).

AvdO: Indeed. Aren't the changes pointing in quite the opposite direction: a lack of openness and growing injustices, and corporate models to finance universities affecting academic education, research, and publishing? For example, South African film and media scholar Keyan Tomaselli recently published a radically polemical book on the restructuring of South African universities as corporate universities or "cash cows" in the grip of "manic managerialism" and "academentia" (2021).

AF: As Monika Berger convincingly argued during the Tokyo workshop, the open access policies of big publishing houses are driven in similar ways by economic interests, not by philanthropic motives. We are indeed far from "bibliodiversity" – we rather see its neoliberal antithesis "predatory publishing" flourishing and thereby perpetuating the marginalization of Global South scholars (Berger 2021). While many assumed that OA would help make the South's scholarship more visible,

> there is growing evidence that open research practices or "openness" – when decontextualized from their historical, political, and socioeconomic roots – rather than narrowing gaps, can amplify the overrepresentation of knowledge produced by Northern actors and institutions and further the exclusion of knowledge produced by marginalized groups. In other words, open systems may potentially replicate the very values and power imbalances that the movement initially sought to challenge. (Albornoz, Okune, and Chan 2020, 65)

On a more fundamental level, questions of (in)visibility, (non)accessibility or (re)usability address political and ethical issues that have been discussed

by scholars like Miranda Fricker (2007), Boaventura de Sousa Santos (2015), Walter Mignolo (2006), Sayan Bhattacharyya (2018), Nathan Andrews and Eyene Okpanachi (2012), and David Mills (2022) – to name just a few prominent voices. All these authors have addressed the problem of epistemic inequalities in current-day digital research practices. They challenge us to think about the question of how to avoid the reproduction of imperial or colonial knowledge structures in an age of digital platform capitalism.

As Alan Liu emphasized during the workshop, infrastructural inequality is a key concern of global Digital Humanities and affects the practices of doing and thinking in multiple ways (Del Rio Riande 2022). These inequalities concern both the "software" and the "hardware"; data colonialism and infrastructural inequality go hand in hand. While the DH community would certainly agree that open, collaborative, and decentralized infrastructures seem to be the best tools for building community setups and knowledge without monopolies, the reality looks different.

AvdO: Are we looking at a deepening of the abyss of inequality?[4]

AF: Developments are sadly worrying. One concern is the lack of multi-lingualism. Michael Gordin argues in *Scientific Babel* (2015) that English-language dominance makes huge parts of scholarship around the globe, especially from the Global South, invisible. This effect is deepened by mass digitization efforts such as Google Books. Invisibilization is a byproduct of such scale and network effects generated by Western digital knowledge infrastructures and technologies driven by "cognitive capitalism." They hinder the inclusion of non-Western traditions into the global knowledge ecosystem. As Sayan Bhattacharyya has argued, "the greater the distance of the cultural object from the metropolitan center, the greater, as a rule, the extent of this nonconformity and greater, consequently, the chance of knowledge objects undergoing occlusion and invisibility" (2017, 31-41).

AvdO: Is this the case for all non-Western (knowledge) cultures? Is Japan perhaps an exception?

AF: As Harald Kümmerle has shown regarding the example of Japanese DH, the problem is more intricate (2022). While Europe as well as China have long seen themselves as the centers of civilization, this does not apply to Japan. For

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4   Malte Hagener also addresses this issue in his chapter in this volume, "Streams, Portals, and Data Flows: Digital Infrastructures of Film Studies."

Japan, the center has always been on the "outside." Yet the tense relationship between "inside" (*uchi*) and "outside" (*soto*) has been at the very heart of Japanese culture and historical thinking (Schwentker 2022). This has led to a very peculiar situation when it comes to the role of Japanese science in the Global South: the "successful" appropriation of Western norms and values in Japan has given birth to a Japanese form of "orientalism" now reproducing epistemic injustices by projecting them onto China or Korea (Kümmerle 2022).

As this example shows, epistemic values and virtues are not only negotiated, appropriated, or contested in local "trading zones" such as DH Labs or Centers, but they are embedded into wider "contact zones" of cultural exchange and knowledge transfer. As emphasized by Kenji Ito and Emmanuel Gnué-Um during the Tokyo workshop, we need to question the self-declared universalist assumptions of the "epistemic virtues" that underpin human thought. Many "epistemic spaces" of knowledge production in Africa remain framed by colonial heritage, and the dominance of English as the lingua franca impoverishes education and linguistic/cultural diversity in both Europe and the Global South. To foster diversity from a global Digital Humanities perspective, Gnué-Um argued, we need to de-essentialize languages and understand them as a form of "doing," a situated knowledge practice, that can hardly be standardized or "translated" into large-scale language models (2019).

Another thought-provoking example of underrepresented "epistemic spaces" was presented by Anat Ben-David during the Tokyo workshop: due to the political turbulence in the aftermath of the collapse of Yugoslavia, Kosovo does not have a top-level domain name – and therefore it is "invisible" when looking at the Web to find out what is remembered from Kosovo in former Yugoslavia (Ben-David 2016). More broadly, the problem is that the Web as the "leading medium" of the present is only marginally archived; the Internet Archive – which is a private initiative that does produce regular copies of URLs – is again an example of overrepresentation of the Global North. In that sense, the Web can hardly be interpreted as a place of digital sovereignty. Today, platform owners such as Meta or Google are the bosses of the archives of the future, so the question is how to decolonize public archives from internet giants.

Visibility

AvdO: As you know, Calvino devoted a chapter to Visibility. It seems appropriate to value Visibility as a virtue in light of the vices of under- and

overrepresentation we are talking about. Do the problems we are looking at demand from us that we should cultivate disobedience as a virtue, not necessarily as an epistemic virtue – though you might also have specific thoughts on that – but as a political virtue, that is to say, as a collaborative refusal to obey the rules set by Big Tech?

AF: While most (Western) thinkers of postcolonialism plead for a critical revision of the intellectual foundations of modernist and universalist norms and values in view of a more diversified and inclusive agenda, Walter Mignolo proposes a more radical approach. Strongly influenced by the work of Aníbal Quijano and his concept of "coloniality," Mignolo calls for a "new rationality" breaking with the universalist underpinnings of modern philosophical thinking. To Quijano, modern epistemology and rationality are intrinsically intertwined with the project of colonialism (1992).

As the matrix of power of Western modernity is built on epistemic, hermeneutic, and perceptual values and virtues, Quijano argues, truly decolonial thinking has to "delink" itself radically from these modernist assumptions (2016). In other words, decoloniality has to be a project of epistemological delinking rather than transformation. Mignolo's call for "epistemic disobedience" strongly resonates with this radical position, and he proposes a new geopolitics of knowledge, strongly emphasizing the situatedness and locality of knowledge production practices (2012). To Mignolo, "truth" as a central value of scientific endeavor has to be locally rooted and contextualized: "pluriversality" and "multipolarity" are the key fundaments of decolonized thinking (2018).

As much as I sympathize with these values, I wonder how I – as a typical representative of white, male, and "Western" scholarship – could contribute to this radical program of decolonization. When translated to the geopolitical reality of current-day digital knowledge infrastructures and institutions, one possibly needs to reframe Mignolo's critique of Western hegemony in the light of the neoliberal ideology of global financial capitalism as outlined by Joseph Vogl. In his latest book, Vogl analyzes the close alliance between the economy of information and platform capitalism and how it affects democratic decision-making processes and the production of socioeconomic realities (2023). This new reality of data-driven platform capitalism frames our political economy and affects academic realities and scholarship all over the globe. Leslie Chan, who has been involved in numerous initiatives promoting global knowledge commons, draws a rather somber picture when comparing the current situation to the hopeful beginnings of the open-access movement some twenty years

ago.[5] The powerful commercial players controlling the indexing regimes, interoperability standards, and ranking mechanism do in fact amplify the gaps between "northern uploaders" and "southern downloaders"; they deepen the epistemic inequalities.

Despite this rather disillusioned outlook, I fully agree with Chan that we have to turn the "gaze" back onto academic institutions. We need to ask ourselves how our own academic institutions, as well as funding policies, contribute to inequalities in access and production. We have to question how we are complicit, how we are implicated, and hopefully, how we can find ways to redress the structural inequalities that we help to maintain – by reflecting on our own institutional responsibilities. We need a new culture of recognition for the great variety of situated practices of digital knowledge production in the field of the humanities at large, a new "style of reasoning" (Fleck 1980; Hacking 2002). And this culture should be characterized by the new epistemic, political, and ethical virtues we discussed.

AvdO: Virtues that Calvino so eloquently framed in his *Six Memos*. Thank you so much, Andreas, for your good company on a journey into unknown territory, that is to say, thank you for your discussion of the virtues we need to be reminded of at this transformative moment in time.

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Technics is a multi-modal, transdisciplinary, and free-ranging challenge to "come to terms" with how we talk about digital media's micro and macro materials, practices, and cultural force fields. The contributors expand, transform, and/or leave terms behind with a contemporary eye on "everything, everywhere, all at once." In its entirety, this is a serious, delirious, and oddly comforting must-read that not only records but also models our present moment.
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