Taking Measures

Usages of Formats

in

Film and Video Art

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Taking Measures
An Introduction

Fabienne Liptay

17′

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This book's title—*Taking Measures*—has a double meaning: as a reference to the practices of measurement and to the political potential of power and resistance. The focus is placed on the formats of film and video art, in which the technologies and ideologies of measurement, their many validity claims and areas of application are addressed. Artistic media are subject to various practices of measurement. They are described and evaluated according to their size and proportions, depth and width, length and duration, rhythm, timing, and so on. These categories are aesthetic, but they are also effective in a social and political sense, as they subject the use of artistic media to certain conditions of production and distribution. It is here that format as a decisive category comes into play.

The designation of film formats such as 35 mm, 16 mm, or 8 mm, for example, is determined by the width of the filmstrip, which in turn corresponds to the size and aspect ratio of the single frames, as well as the duration of the film projection at a given frame rate. Magnetic videotape formats such as U-matic, Betamax, and VHS, or digital-media formats such as floppy disc, CD-ROM and DVD are defined according to their image resolution, running time, and storage capacity. As units or ensembles of technical specifications, formats are the result of historic processes of industrial standardization subject to the imperatives of uniformity and profitability. Format standards guarantee technical compatibility as well as economic competitiveness on the global market. They determine not only the technical conditions under which images and sounds circulate, but also where and by whom they are seen and heard, the speed at which they travel, the channels through which they are distributed, and how effective or affective they are. Thus, formats determine the conditions under which images and sounds come to be publicly accessible and how they are used as measures in specific contexts.

In view of its significance for artistic and curatorial practices, the format as a theoretical concept has become the focus of increased attention. Despite their differences, many recent approaches share a common objective, namely, to address the use of formats in ways that are not exclusive to artistic practice. (1) The focus lies on artistic practice "after art," (2) on the multiple dependencies of artistic production, its technologies, and methods on political or economic interests. In this regard, David Joselit speaks about format as a structure or a "connective tissue," (3) wherein the worldly entanglements of images—the techniques of their production, the efforts

(1)
See, e.g., the approaches to "format" by David Joselit, Jonathan Sterne, David Summers, Benoît Turquety, Haidee Wasson, and many others.

(2)
I am alluding to David Joselit, *After Art* (Princeton and Oxford: Princeton University Press, 2013).

(3)
David Joselit in conversation with David Andrew Tasman, "Against Representation," *DIS Magazine*, 2015, http://dismagazine.com/discussion/75654/david-joselit-against-representation/.

associated with their creation, the mode of their circulation, the historical conditions of their making—become visible.

The techniques of measuring time and space that have accompanied film and video throughout their history to today are subject to various processes of negotiation in the interest of science and politics, industry, and commerce. Consequently, film and video have themselves served as measuring devices for scientific and analytical purposes, whereby they are employed beyond exhibition spaces and movie theaters in a variety of fields such as anthropometry, criminology, biometrics, forensics, statistics, robotics, operations research, and tactical analysis in sports and military intelligence. In these fields, they have contributed to the acquisition and sharing of knowledge, to research and investigation to the same extent as they have been involved in the "politics of large numbers" (4) (Alain Desrosières) and the history of the "mismeasure of man" (5) (Stephen Jay Gould)—in the governmentally and ideologically motivated production of evidence through the collection and management of useful data. However, in acknowledging these dependencies, in view of which art puts its autonomy at risk, also lies the opportunity for art to test its own effectiveness in public space and to uncover potential for resistance in artistic action. Formats indeed regulate the use of artistic media, in so far as they are scripts that contain guidelines for action through which historical knowledge and experience are accessed and distributed. At the same time, however, they are a showplace for negotiating, verifying, or dismissing the knowledge and experience they make available in standardized form.

Finally, formats represent a particular challenge in the conservation and curation of collections. On the one hand, in addition to the works of media art that exist in obsolete formats, the technological systems and devices on which they can be played must also be preserved and kept in working order. On the other hand, the question arises as to the conditions under which these works should be converted into current digital formats to ensure that they can be exhibited in the future and possibly to retain a work's original artistic concept—or even to realize this concept for the first time in situations in which it was impossible under the prevailing historical technological conditions. Conversely, conscious artistic recourse to "retrograde technicity" (6) (Gabriele Jutz) can also be considered an act of undercutting technological standards, which is associated with subversive modes of format usage. Formats can circulate between the areas of normative and alternative usage or can be recontextualized through acts of appropriation and translation. In addition to the artistic decision in favor of a particular format, institutional practices also come into focus since they determine whether or how films and videos come to be exhibited in the specific contexts of museums and cinemas as well as on television and the Internet.

The book opens with a visual essay by THOMAS JULIER that is arranged like an edited film. The series *Carrion Crow*, composed from eleven photographs that were carefully selected from countless shots to produce a narrative, were taken in the winter of 2021 in the Jardin du Luxembourg in Paris. It shows two crows flying towards the statue David vainqueur de Goliath and settling on it, with the Tour Montparnasse in the background. The series refers to the experimental beginnings of photography, in which image sequences played a central role, as well as to the ambiguous symbolism of crows that figure prominently in literature and the arts. Here, the photographs are combined with digital images generated from text descriptions with the AI system DALL·E, thereby exploring the tensions between the rigorous metadata registered by the photographic camera and the images generated from texts by the neural network. The captions of the AI images refer to the text inputs on which they are based, while the captions of the photographs indicate the time they were taken, which the camera records in the metadata of the file. The essay's title—*48.8472314803343 2, 2.337387765110 2917*—specifies the geo-location, which was also recorded by the camera. The relationships between images and data, their "good connections," are also the subject of the contribution by UTE HOLL in which she considers the challenges that arise from the fact that in using mobile devices as travelers, workers, or migrants we navigate in digital and physical worlds at the same time. Considering the deep ambivalence of data operations and the areas of their application, she still claims the image worlds generated from data as a space that opens up new possibilities for action and the networked sharing of knowledge. Such possibilities are explored in her film *Amitié* (2020), made together with Peter Ott, which puts the usage of computed images in the service of friendship. Combining both hypothetical and empirical data derived from research on the media practices and skills of migrants, the film creates a world of image data on the basis of 3D scanning technology provided with the LiDAR camera. She places the use of this technology in a genealogy that Harun Farocki traces in *Images of the World and the Inscription of War* (1988) from the photogrammetry invented by Albrecht Meydenbauer in the 19th century to the aerial photography in warfare, which is further explored by VOLKER PANTENBURG in his contribution on images as measuring devices. He develops his argument from working material that is held in the Harun Farocki Institute's archive, among it the filmed performance around the screening of Farocki's film *Before Your Eyes: Vietnam* at the 1982 Berlinale. In the performance, Ronny Tanner, who in the film plays a US pilot, explains how his military mission involved the comparison of aerial photographs of a village, while Farocki assumes the role of a group of Vietnamese children gathering around him and asking him questions. Pantenburg is particularly interested in the performance as demonstration of a "dialectic between measuring and interpreting (mathematics and hermeneutics)." He follows this idea through the working material in the archive, confronting Farocki's *Images of the World and the Inscription of War*, a film on the entanglements of the photographic image with technologies of measuring, with archival material shot in an early stage of its production, in which a group of children is gathering around two statues in the collection of classical antiquities in the Berlin State Museums, among them a blind girl that touches the statues and shares her sensations with the others. While this material did not make it in the finished film, Pantenburg argues that it serves as a "potential counterimage" to the optical operations of measuring, while the children may be understood as "antagonists to the technocrats and forensic focus of police and military laboratories."

Such haptic experience, emerging from the repeated viewing and scrutinizing of archived film material at the editing table, is further explored by ALEXANDRA NAVRATIL, who looks at

(4)
Alain Desrosières, *The Politics of Large Numbers: A History of Statistical Reasoning*, trans. Camille Naish (Cambridge, MA: Harvard University Press, 2010).

(5)
Stephen Jay Gould, *The Mismeasure of Man* (New York: Norton, 1981).

(6)
Gabriele Jutz, "Retrograde Technicity and the Cinematic Avant-garde: Towards a New Dispositif of Production," *Recherches sémiotiques / Semiotic Inquiry* 31, nos. 1–2–3 (2011): 75–94.

Krakatau, a Dutch expedition film from 1930 that she encountered during her research at the Eye Filmmuseum's archive. She describes three short sequences of a volcanic eruption on the Indonesian island of Krakatau, viewed in slow motion, with emanating clouds dissolving the image into formlessness, followed by explosions of ash and smoke that seem to blend with scratches and dust on the film's material base. This view is measured against the lines of an altitude scale drawn in black paint on a window pane, through which the eruption appears as if seen through a crosshair, and the lines of inserted seismograms that nervously register the volcanic activity. Against these measurements, the image appears even more enigmatic, "a dense undecipherable text" that is poetically evoked by the author's words, borne of a close encounter with the material that comes to resonates with the haptic experience contained in the archival substrata of Farocki's images as measuring devices. The elusiveness of the film image, its almost alchemical potential to transform matter, informs also DOROTA SAJEWSKA's essay, in which she contemplates time in the cinematic and anthropological work of Maya Deren (Eleonora Derenkowska), the Ukrainian-born American film director, writer, and performer, as well as a researcher of Haitian culture. Deren's films attempt to measure time through the body as a medium that exists in both the natural world and social reality, allowing her to connect a deeply subjective experience of time with its passage independent of human beings. In her work, the body becomes the manifestation of multidirectional energy and chiasmatic matter that enters into a dynamic and reflexive relationship with moving images and different temporalities. Of interest to Deren are not the particularities of experience or identity, but what the author, borrowing from Elizabeth A. Povinelli, calls "the entanglement of existence," from which more-than-human commonalities may emerge.

The following essays are grouped together as contributions to the uses of formats in artistic film practice. Written in the form of a manifesto for the future of an obsolete format, PHILIPP FLEISCHMANN makes an argument for analog film that he has been using in a series of works on the architectural dimensions and institutional relations of exhibition spaces—from Vienna's Secession Building in *Main Hall* (2013) to the Venice Biennale's *Austrian Pavilion* (2019)—in which he quite literally explores the filmstrip as "a unit of measurement and interaction" in actual space. Frequently, the filmstrip is itself exhibited as in his recent *Film Sculptures* (2022), in which a 16 mm film is being projected while the filmstrip is made visible at the same time. By renouncing film's utilization both to reproduce a continuous image of reality through the succession of single frames and to create a visual abstraction of it, his works create a space "in which the politics of descriptive representation appear negotiable." Quite the contrary, for MARIJKE VAN WARMERDAM "everything can be a film" independently from the analog or digital technologies she uses to make her films. Her text is a personal reflection on her work, an assurance and review of her artistic practice that takes as its point of departure Migros Museum's invitation to consider a digital version of *Koor* (*Choir*, 1997), a work from the museum's collection devised for the projection of two 16 mm films. In their respective stances, the contributions by Warmerdam and Fleischmann enter in a dialog about the divergent practices that shape the field of contemporary artistic film practice. Jean-Luc Godard's *Le Livre d'image* (2018–), which JACQUELINE MAURER discusses in her contribution, transforms the challenges posed to films by different exhibition venues and their format standards into what the author, with Nicole Brenez, one of the collaborators on the film, calls the "multiformities" of its variable installations. From its first installation at the Théâtre Vidy-Lausanne in 2018 to its reception at the Château de Nyon in 2020, where it was disassembled and recomposed in aleatory and dispersed ways, *Le Livre d'image* has been presented in different forms and formats, whereby the spatial and historical characteristics of each venue become inscribed in the work and its site-specific viewing experience.

In the context of decolonization, the issue of formats relates to quite different challenges that BENOÎT TURQUETY explores in his contribution on UNESCO's support of anti-institutional struggles to empower film production through the use of substandard formats in "developing" countries. Following the independence of former African colonies, the United Nations announced two development decades in the 1960s and 1970s, in which the promotion of local ecosystems of film production and education became gradually associated with light media. Of the many discussions on this subject held at UNESCO's round tables in these years, Turquety considers the report by Mario Ruspoli in favor of a "direct cinema for developing countries," presented at the roundtable in Beirut in October 1963, particularly important, because it envisioned radical new ways of film practices to result from economical and versatile technical structures. In reconstructing the discussion on the political potential of small film formats from UNESCO's archived documents, he also explores the obstacles, in particular the dependence of technical networks on electricity, that eventually turned this project into a failed utopia, but also paved the way for the informal or illegal power structures from which Nollywood emerged. The issue of formats is again entangled with the history of colonization and anti-colonial struggle in my text that discusses works by Stan Douglas, some of which, as his *DCT*s (2016–) and *ISDN* (2022), are quite obviously named after particular technical standards. By aligning formats as scripts of interaction to notions of habit, to which Bourdieu ascribed symbolic violence, my text aims to explore the transformative potential that arises from moments of breakdown, of the disruption of communication and data transmission within media infrastructures. In displaying imaginary or fictional scenarios as well as technically elaborate processes in which such moments of breakdown uncover the otherwise invisible infrastructures and their investment in power relations, Douglas's works represent particularly compelling instances of a repurposing of formats to envision other forms of relating through the disconnection from habitual experience.

In a next constellation of texts, relations between measure and value come to the fore. The short or long duration of films that deviate significantly from the standard length of feature films offer particularly interesting cases for interrogation with the dominant production and attention economies of the cinema and the gallery. In her essay on Wang Bing's *15 Hours* (2017), ERIKA BALSOM reflects on the film's duration after which it is titled. Shot continuously during one working day, in a Chinese garment workshop for children's clothing that employs hundreds of thousands of migrant workers, the film

chronicles the labor conditions of these workers who are paid according to the number of pieces they can sew in a given time. Having premiered at documenta 14, the film was shown at the Gloria cinema in Kassel as well as the National Museum of Contemporary Art in Athens, where it was unlikely to have been seen in its entirety by any viewer. Placing the focus on digital technologies that have offered new possibilities of durational recording, Erika Balsom considers the "chimera of endlessness" as an interrogation of standardized forms of cinematic experience. Continuous recording is both acknowledged in its duplicative and transformative potentials, endowing the image with a sense of inexhaustibility that deliberately contrasts with the enforced efficiency of the workers' gestures the camera ceaselessly records. From a complementary perspective, LAURA WALDE looks at the economy of the short film as it is explored in James Kienitz Wilkins's *This Action Lies* (2018), commissioned by the BMI, Geneva's biennale of the moving image, on a budget of $10,000. In the film, the only thing we see is a hot take-away coffee, shot on three single rolls of 16 mm film, in different lighting setups as if staged for an advertising spot, while we hear the filmmaker's voiceover speaking about how he invested all his money in his commissioned artwork and is now trying to figure out how to make money from it to pay his rent and afford his daughter's future college education. In performing the role of an artist in a commercial context, he navigates, as the author argues, in "the continuum between artistic integrity and capitalist commerce by way of a quasi-archaeological use of language and technical formats." The question if we "buy into" the film is thus explored in its notions of value generation, appreciating the gesture of the artist's "selling himself short" as an act of witty apology. The issue of surplus value generated by intellectual labor is also addressed by WARREN NEIDICH who considers the transition from an information- and knowledge-based economy to one he describes as neural- or brain-based. Regarding brain-computer interfaces and related neural technologies, he argues that their accumulation in the sociocultural and economic spheres will affect the material brain, producing what he calls the "superordinate precariat" of late cognitive capitalism. Advanced technologies, such as telemetric and telepathic devices, are discussed for their ability to create immersive irreal memories: the political consequence of which is a "collapse of the freedom of choice" under the conditions of cognitive labor. However, telepathy's capacity for poetic dissonance also attests to the potentials for resistance and mental proficiency that can be achieved through neural plasticity.

The last three essays of the book are concerned with the measuring and monitoring of bodies and behavior in scientific research, and the irritations that result from their transfer into the aesthetic sphere. HANNES RICKLI's contribution is a reflection on his audiovisual installations that make tangible the digital work of scientific measuring devices and infrastructures. For this purpose, in his collaborative projects he has devised his own measuring systems to make perceptible the commonly unobserved research on animal behavior conducted in biological laboratories and in fieldwork. In the artistic investigation of research laboratories in Paris, Zurich, Spitzbergen, and Austin, Texas, he touches on the question of the agency of biological matter and energies in creating the knowledge

gained from their monitoring and measuring, as well as on the networks that organize the cooperation of the human and non-human actors in these research environments. The transition from analog to digital practices, having shifted research from the realm of observable phenomena to the black boxes of discrete processes, plays an important role here, as they have created media-ecological infrastructures and data environments whose artistic exploration itself requires elaborate technologies to make the operations in these black boxes perceptible. Discussing Dani Gal's film *White City* (2018), BURCU DOGRAMACI is concerned with measurements in the biopolitics of nationalism and modern architecture. The film centers on the historical encounter between Arthur Ruppin and Hans F. K. Günther, who met in 1933 for an exchange on their theories of race. A key supporter of the early Zionist settlement in Palestine, Ruppin adopted the idea of a Jewish race on which National Socialist racialist thought, as advocated by Günther, was founded. *White City* stages their encounter at the Weissenhof Estate built in 1927 as a showcase for modern architecture and is imagined in the film as an Arab housing colony. The author examines how the film uneasily conflates the ideologies that become associated through measuring practices, thereby relating Zionism, Nazism, Modernist architecture, and the Nakba. By looking at the photographic media depicted in the film, she shows how it also reflects the participation of these media in the history of measuring for ideological purposes. The book concludes with a conversation between URSULA FROHNE and EYAL WEIZMAN, founding director of Forensic Architecture, on *forensis* as a critical practice. Beginning with an explanation of the meaning of *forensis*, the conversation revolves around Forensic Architecture's investigative work, which takes inspiration from the original idea of forensics as that which belongs to the forum as the public space. Weizman describes its specific approach to the production of evidence in and against the problematic historical resonances of forensic methods. Considering it as a form of counter-forensics, *forensis* has served as a critical practice for the contestation of political and juridical crimes, as in the case of the unresolved murder of Halit Yozgat by the National Socialist Underground on April 6, 2006. To investigate the plausibility of the testimony given by Andreas Temme—the German domestic intelligence agent who was present at the time of the murder yet claims to not have witnessed it—the series of events was restaged in an accurate architectural model of the family-run Internet café where Halit Yozgat was shot, while in parallel, digital simulation technologies were applied to provide further evidence. In their conversation, Frohne and Weizman discuss *The Murder of Halit Yozgat* (2017) together with *Sea Watch vs The Libyan Coastguard* (2018) and *The Beirut Port Explosion* (2020) as attempts to establish new ways of collaborative truth production based on research data.

In the authors' considerations, a variety of questions are addressed: How can formats themselves, as the measures of art, be exhibited? In which sense can they be addressed as the "connective tissue" that relates spaces, bodies, experiences, and memories? How can they be put in relation to exhibition spaces and their economies of valorization in an institutionally critical way, and how can this relationship be assessed? What challenges and possibilities arise regarding the history of formats and the response of reformatting in

artistic and curatorial practice? In which non-artistic practices of measurement, of the production of knowledge and evidence in the interest of useful research, are formats involved? In what way can artistic practice not only make these involvements visible but challenge and test them? In what way can it engage in the negotiation, in the rejection or defense of such categories as knowledge or truth? How can it subversively interact with the history of the "mismeasure of man" by repeating historical strategies of the legitimization of racist and colonialist views in compliance with media technological standards? How can technologies of measurement and data analysis in art be used politically and made operative for the public sector?

This book has evolved from a series of dialogs between artists and researchers. It began with the planning of a common symposium as part of the SNSF project "Exhibiting Film: Challenges of Format" at the Migros Museum für Gegenwartskunst in Zurich in March 2020 that was thwarted by the first lockdown, and then developed into what is now the video gallery of conversations, essays, and films launched on www.takingmeasures.ch in January 2021. (7) For this volume, the video contributions again had to be transformed to meet the requirements of the printed pages of a book. Inadvertently, the project itself became an instance of its subject, while navigating through different media and formats. The result is thus far removed from a usual conference volume, having evolved from a process of interruptions and reconsiderations.

This publication would not have been possible without the participation and advice of a number of individuals and institutions, to whom I would like to express my gratitude. I wish to thank my collaborators on the side of the Migros Museum für Gegenwartskunst, Michael Birchall for the indispensable support and involvement in the publication as well as Nadia Schneider Willen in the video symposium that preceded the book. For the project "Exhibiting Film: Challenges of Format," from which the book originated, we received generous support from the Swiss National Science Foundation, without which our endeavor would not have been possible. The publication of this book was enabled by research funding from the University of Zurich. Carla Gabrí and Laura Walde who completed their dissertations as part of the project, contributed significantly to the project activities as researchers and are acting as co-editors of this book. Diliara Frühauf provided valuable editorial assistance.

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Above all, I thank the authors who contributed to this book for their unwavering commitment and patient work on the project sustained by intellectual friendship and common spirit. Many of the disruptions the project faced were transformed by them into serendipitous findings and creative reinventions.

Fabienne Liptay, February 2023

(7)
The video symposium was realized in a cooperation between the University of Zurich and the Migros Museum für Gegenwartskunst. It was organized together with Carla Gabrí and Laura Walde as members of the research project "Exhibiting Film: Challenges of Format" and Nadia Schneider Willen and Nurja Ritter as project partners on the side of Migros Museum für Gegenwartskunst.

(8)
Our calculation is based on an average reading speed of around 250 words per minute.

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Thomas Julier

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Nineteenth-century photograph of an ink drawing of a flying raven

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Nineteenth-century photograph of a raven picking seeds

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Nineteenth-century photograph of a raven sitting on a tree

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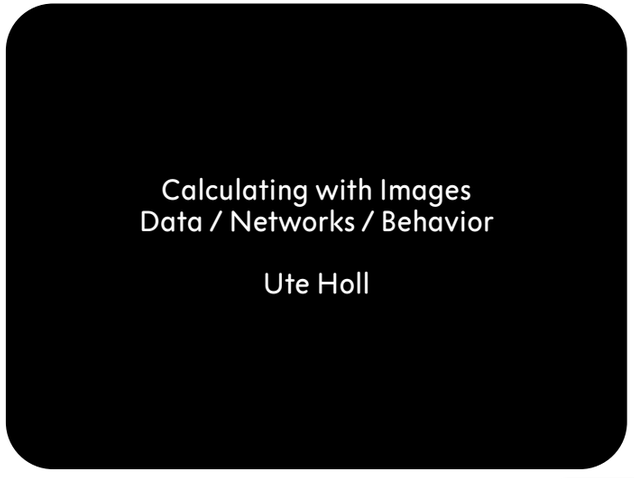

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"Metrology is only the official and primary component of an ever increasing number of measuring activities we all have to undertake in daily life."
Bruno Latour, 1986 (1)

1. Good Connections

Data and images do not just compete with one another in a "war between data and images" (2) as suggested by a strict distinction between images, writing, and numbers. Nevertheless, images and data until now seemed to belong to different categories. Phenomenological theories of perception and structural psychoanalysis, and even filmmakers like Jean-Luc Godard, have vigorously defended the realm of the imaginary as pictorial knowledge against the discrete accounting of data in symbolic orders of numbers and letters. The images and the imaginary were considered as resistance against a numerical measurement of the world. (3) Meanwhile, however, we have to reckon with the fact that in the everyday use of images and icons, such as those provided for electronic user interfaces, imaginary and iconic operations are instantly transformed into numbers and algorithms—only for them to be returned to us almost instantaneously in the form of images. In principle, it doesn't matter whether we are developing our skills to compete with the speed of video games or to order clothes or books online. All of these image operations are translated into data and algorithms, and then also back into the real operations and processes of a real material world. Thus, we inhabit physical and digital worlds at the same time, and our behavior is simultaneously between the logics of shape and the logics of numbers.

The processing of data into images and of images into data, accelerated to real time, not only generates discrete data sets, but can also be transformed into artificial worlds, into images and sounds, within which we move by seeing, hearing, and touching screens —not simply in order to obtain information about the world, not only to orient our worldly behavior, but also so that we can really act, operate, and differentiate within it, as well as we possibly can (fig. 1). Decisions that are made within these networks as part of a cooperation of human as well as non-human actors, according to the actor-network theory, (4) within connections of people, interfaces, and algorithms, do not only concern present behaviors, but can even make decisions about the future behaviors of pilots, students, customers, or migrants. If we orient ourselves according to images in order to quickly gain an overview and react, our margins are already calculated statistically and probably in terms of a logic of exploitation, and it remains for us to play, to experiment with algorithms, and to possibly outwit them. (5) Therefore, the concept of a subject that can critically intervene in political, economic, ecological, social as well as artistic processes, is improbable. Rather, we would have to investigate

(1)
Bruno Latour, "Visualisation and Cognition: Drawing Things Together," in *Knowledge and Society: Studies in the Sociology of Cultures Past and Present*, vol. 6, ed. Robert Alun Jones and Henrika Kuklick (Greenwood: JAI Press, 1986), 1–40, here 28.

(2)
See Steve F. Anderson, *Technologies of Vision: The War Between Data and Images* (Cambridge, MA and London: MIT Press, 2017).

(3)
See Rudolf Arnheim on aesthetics, Jacques Lacan on psychoanalysis, Jean-Luc Godard in, for instance, *Le livre d'image* (*The Image Book*, 2018).

(4)
See Bruno Latour, "On Actor-Network Theory: A Few Clarifications Plus More Than a Few Complications," *Soziale Welt* 47, no. 4 (1996): 369–81.

(5)
See also Shoshana Zuboff, *The Age of Surveillance Capitalism: The Fight for a Human Future and at the New Frontier of Power* (New York: PublicAffairs, 2019).

forms of subjectivation that emerge in the course of operations with the image machines and numerical machines. Cinema as a post-cinematographic network is one of such operations. Hybrid, sometimes undesirable subjectivities are generated within the rapid image-data transformations that can be viewed in various forms of projection, but sometimes they may also be in keeping with our wishes, as Jean-Luc Godard quoted André Bazin: "The cinema substitutes for our gaze a world more in harmony with our desires." (6) Of course, this appears as a somewhat uncanny kind of wish fulfillment. But still, neither aesthetic nor economic calculations can do without dynamics of desire.

Precisely because image worlds generated from data calculate statistically according to probabilities, they can also open up unexpected spaces and options for action. The hope behind navigating according to fast images, instead of processing endless rows of numbers, is that electronic and digital experts can then navigate faster than, for example, the commercial wish-fulfillment machines want to allow. Differences of expertise and experience are usually considered as generation gaps of competence, or as a divide between the rich and the poor in the realm of the digital. However, this assumption seems to be wrong. There are shared networks in which knowledge from different kinds of expertise is combined and accumulated: knowledge about the concrete physical world, knowledge that is fed by users of digital images and maps, emerging knowledge of data and addresses. This gives rise to hybrid forms of behavior on both sides, on the Internet and in the material world. This applies, for example, to the navigation of migrants and mobile workers on the move in unknown territories. Nethnologists, field researchers studying migration communication, have detected this in the media operations of border crossing. Sociologist Vassilis Tsianos states:

> There are multimedia environments of empowerment in the world of migration. I do not know why research holds on to the thesis of the digital divide. [...] We, on the other hand, speak of connected migrants, of people who do very well in multimedia environments and already did so before they started their migrational project. (7)

In terms of these good connections within digital connectivity, it would make more sense to speak of people, strategies, projects, attempts, ideas, and solutions rather than of "subjects" and "free choices." But only these latter categorizations, obviously allow for migrations to be criminalized as "illegal," while they would be better described as journeys people undertake because they need to get out of a country or because their help is needed in another, usually European country, mostly in agriculture or in nursing. While a paradoxical political rhetoric clings to notions such as the "people smuggler" or "human trafficker" or to the notion of secret infrastructures such as the "Balkan route" in order to disqualify the communications, movements, and actions of migrants, it would be preferable to describe and discover these structures as an intelligent network of people, devices, practices, and forms of transmission that gathers information and assembles it into a reasonably coherent picture to make it accessible. The travelers, migrant workers, or migrants looking for work, mutually communicate the nature of routes, supply and transport options, or structures of border crossings, and from these data on distances, lighting conditions, temperatures, recording techniques, connections and supplies, others can then form a picture of a world in transit—instantaneously and self-determined, just as fugitives would have wished to do during World War Two, for example. (8) On the other hand, similar networks could offer information on the need for aid in care work and corresponding forms of labor that could in the end support and sustain overly aging Western societies. Oddly enough, it is often these very societies that reject such worldviews and the logics and logistics they ultimately depend on.

Necessary technologies are available, such as useful neural networks that translate data into signs, maps, and images, which people can use to orient themselves, make decisions, and take action. This proves itself daily in the context of economic and military practices and is successfully implemented on commercial platforms. Such forms of "knowledge that is of interest to the competitive war-games of the corporate world," (9) are, according to Isabelle Stengers, also already determining academic research and scientific evaluation. However, within the contexts of cooperation and collective thought, network knowledge is often still pieced together fragmentarily, ad hoc, and slowly. Perhaps these mixed or hybrid forms of knowledge, which consist of digitized information and its algorithmic processing on the one hand, but also of behavior in the contingencies of the real and material world, are the most resilient. Still it seems to be a complete fantasy to generate knowledge from, for example, the traffic of data and images of migration, knowledge that no longer serves "the competitive war-games of the corporate world," but rather a social and economic balance, a political ecology. (10)

2. Mobile Commons: Amitié

We have applied the fact that, against all historical experience, images and communications can in fact generate helpful, non-warlike practices from computed data as the vision of our feature film. (11) We have turned the structure of both hypothetical and empirical data from migration routes into a virtual world of imaginary and at the same time operative images. With the help of self-learning algorithms—according to the only semi-fantastic idea of our film, which constantly oscillates between comedy and tragedy—a world of data images continuously becomes more and more complex in accordance with the most diverse desires or necessities: on the one hand, to communicate the infrastructures of invisible labor in industrialized countries, and on the other to determine safe routes, mediate jobs, transfer money, or teach languages (fig. 2).

The organization of these operations is not a fantasy, but rather is based on the research results of nethnologists, who study the practices, technical equipment, and technological qualifications of migrants in their need to orient themselves and communicate very quickly and across all languages—that is preferably by means of images. Vassilis Tsianos explains that

> a good cell phone is a very good investment in border crossing. It is not a status symbol. It is a small mobile bank. [...] All communications media play a role. Skype, Twitter, GPS, as well as the very profane letter are very important. The term *mobile commons* includes all media forms and formats, not just those that are digital. With the term *mobile commons*

(6) See Jean-Luc Godard in *Le Mépris* (*Contempt*, 1963) and *Histories of cinéma* (*Histoires du cinéma*, 1989): "Le cinéma, dit André Bazin, substitue à notre regard un monde qui s'accorde à nos desirs."

(7) Vassilis S. Tsianos, "Feldforschung in den 'mobile commons,'" *Zeitschrift für Medienwissenschaft* 7, no. 1 (2015): 115–25, here 117, https://doi.org/10.25969/mediarep/1438. (This and all subsequent translations, unless otherwise cited, are by Katrin Gygax.) The interview from which the sentence is taken also refers to the research Tsianos conducted along European borders together with Brigitta Kuster, Marianna Pieper, and Sabine Hess.

(8) See, e.g., Anna Seghers, *Transit* (Berlin and Weimar: Aufbau Verlag, 1982).

(9) See Isabelle Stengers, *Another Science Is Possible: A Manifesto for Slow Science* (Cambridge: Polity Press, 2018), 107.

(10) Bruno Latour, "Introduction: Que faire d l'écologie politique?" in *Politiques de la nature: Comment faire entrer les sciences en démocratie?* (Paris: Éditions La Découverte, 1999), 9–18.

(11) Ute Holl and Peter Ott, *Amitié,* 2022.

1

figs. 1–2 Ute Holl and Peter Ott, *Amitié*, 2022, color, sound, 108 min, film stills.

2

> we address the distributed ability to act within the continuum of online and offline communication structures, while at the same time being able to provide for the sustainability of this structure in its use. (12)

(12) Tsianos, "Feldforschung in den 'mobile commons,'" 118.

The *mobile commons*, the digitized data-image-knowledge collective, must of course make use of commercial platforms in order to be communicable. Skype, Twitter, and Instagram earn a lot thanks to the *commons*. In contrast, we have set up a different fantasy in our film: We have staged the differentiating network of migration and work as a virtual world that organizes and generates itself from the collected data of all participants as a network among friends. Therefore, this data-image world in the film is called *amitié*, neither *humanité* nor *fraternité* but literally the French for *friendship*. This is also the name of the film: *Amitié* (2022). But cinema as a "world in harmony with our desires" is always also uncanny: Can the well-functioning network of migrants, which in reality organizes operations that are illegal by law on the one hand, and whose data and image forms are safely and legally carried by so-called platform capitalism, (13) on the other, be programed as self-organized and self-determined? Is operating on data-processing platforms different from using public infrastructures such as roads or mail services? Does the self-organized entanglement of data and image operations open up new possibilities in behavior? Or, following the political critique of neoliberal logics of exploitation, do we have to state that in the entanglement of digital and physical worlds through data and images, our everyday behavior, our unknown desires, and each of our everyday actions are subordinated to a commodity logic faster than we can perceive? According to Steve F. Anderson, this is what researchers of technologies of vision are confronted with:

(13) As defined by Shoshana Zuboff, *Das Zeitalter des Überwachungskapitalismus* (Frankfurt am Main and New York: Campus Verlag, 2018).

> The more we believe our physical world to be interchangeable with the digital one, and the more physical space begins to resemble instrumented volumes, the less resistant we will become to the logics of neoliberalism in converting everyday activities into marketable commodities. (14)

When physical and digital image worlds intertwine in a way that makes them indistinguishable, so the diagnosis goes, they do not simply program decisions, but organize behavior. Can other options be discovered in carefully reconsidering the history of the entanglement of data and images?

(14) Anderson, *Technologies of Vision*, 200. See also Wendy Brown, *Undoing the Demos: Neoliberalism's Stealth Revolution* (New York: Zone Books, 2015). Brown does not consider technologies of image-making however.

3. Visible Data Worlds

Data—or perhaps, as Johanna Drucker terms it: *capta*, that which has been captured or entered the net—are never available raw or unstructured, but their production and extraction presupposes structures, practices of collection, and measurement. Gauging devices, presumably also condition situations that are to be solved exactly with the help of data production. (15) This is another reason why data and images are not simply in competition with each other. Rather, as forms of technical imaging, they operate cooperatively and replace our imaginary gaze—though not always in accord with our desires. Instead, we have every reason to believe that the alliance of data and images on platforms tends to establish a relationship to the world without substitutes, producing desires and waking up monsters we had not previously dreamt of.

(15) Johanna Drucker, "Graphesis: Visual Knowledge Production and Representation," *Poetess Archive Journal* 2, no. 1 (2010): 1–50, here 7, https://paj-ojs-tamu.tdl.org/paj/article/view/4. "[…] capta is information that is captured because it conforms to the rules and hypothesis set for the experiment." See also her monograph, *Graphesis: Visual Forms of Knowledge Production* (Harvard, MA: Harvard University Press, 2014). Lisa Gitelman and Virginia Jackson discuss this in Lisa Gitelman and Virginia Jackson, "Introduction," in *"Raw Data" Is an Oxymoron*, ed. Lisa Gitelman (Cambridge, MA and London: MIT Press, 2013), 1–14.

The transfer of measurements into images and of images into measurements, the transfer of physical measurements into figurative images and of figurative images into discrete numerical values, which we already call *figures* in English, was one of the most common procedures of scientific recording systems in the 19th century. Even analog photography itself could be described as the measurement of light intensity with the help of photosensory emulsions, applied to metal plates or paper, as "writing down light as the exploration of light, as spectroscopy." (16) For human eyes, the results of these measurements are perceived as, for example, houses, haystacks, or portraits of people—nature's self-recordings, as defined by Henry Fox Talbot. In forensics or eugenics, on the other hand, architecture, landscapes, or portraits can also be recalculated into measurements from which stereotypes were drawn, for example, of criminal identities or crime scenes, as in the data processing of Paris's police commissioner Alphonse Bertillon, or in the genetic types of Francis Galton, or even in current practices of racial profiling in border regimes that extend to the bus stations of major European cities. Only when the structure of the meta-orders of this data processing is brought into view against the evidence-production of the images, for example in the order of Bertillon's filing cabinet or the procedures of Galton's multiple exposures, does it become apparent that the relationship between measurements and images is also regulated by media-technical, social, and political grids and not by a pencil of nature alone. (17) Only when the operations of grids and screenings, the relations of images and measured values are understood, can the targeted individuals begin to describe themselves differently, along or against the grain of the archive, and thus confront the regime of the gaze, the colonial or postcolonial grid in new pictorial orders. (18) This applies not only to subjectivations, which can thus be literally revised or re-visioned, but also to infrastructures, for example, measurements of the impact of projectiles on buildings, such as those carried out by the group Forensic Architecture in order to ascertain strategies of irregular warfare. (19)

The genealogy of processing measurement data into images and images into measurement data in the 19th century was discovered by Harun Farocki in his film *Images of the World and the Inscription of War* (1988). Farocki based his findings on a new kind of surveying technique developed by the civil engineer and railroad planner Albrecht Meydenbauer, called photometrography or photogrammetry: a form of knowledge production parallel to the project of photography (fig. 3). Farocki's film first shows the well-known photograph of the German Wetzlar Cathedral, onto which Meydenbauer had inscribed an arrow and written "September '58" to commemorate the fact that he had almost had an accident while trying to measure the façade. The back of the photograph reads: "The danger of falling marked with (arrow). Causes the invention of the art of measuring images." (20) Out of danger and distress, Meydenbauer develops the method that combines photography with the calculation of height ratios, which he combines from probing the terrain "by registering horizontal curves" together with photographic measures of the land. Photogrammetry is a method for reliable surveying from a distance. In 1867, three articles appeared in successive issues of the *Wochenblatt des Architektenvereins zu Berlin*, in which Meydenbauer

(16)
Wolfgang Hagen, "Die Entropie der Fotografie: Skizzen zu einer Genealogie der digital-elektronischen Bildaufzeichnung," manuscript paper, Humboldt-Universität zu Berlin, July 10, 2001, https://www.whagen.de/PDFS/11049_HagenDieEntropieder Fot_2001.pdf.

(17)
See Allan Sekula, "The Body and the Archive," *October* 39 (Winter 1986): 3–64.

(18)
See Ann Laura Stoler, *Along the Archival Grain: Epistemic Anxieties and Colonial Common Sense* (Princeton, NJ: Princeton University Press, 2008).

(19)
See Eyal Weizman, *Forensic Architecture: Violence at the Threshold of Detectability* (New York: Zone Books, 2017).

(20)
"Die Gefahr des Absturzes mit (Pfeil) bezeichnet. Veranlassung zur Erfindung der Meßbildkunst."

3

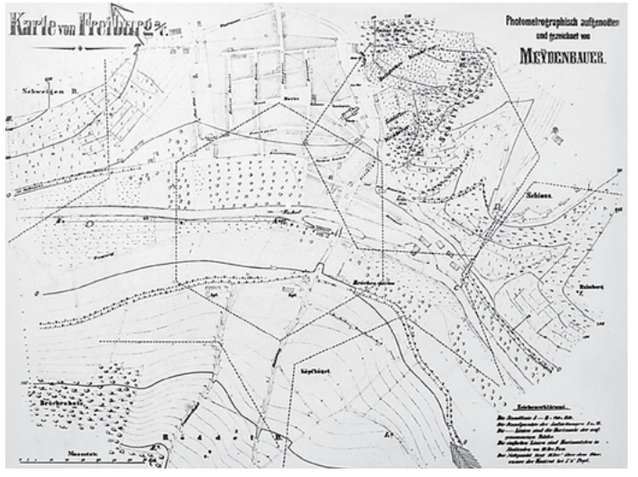


fig. 3 Albrecht Meydenbauer, A topographic map produced with the help of photogrammetry in June 1867. M. 1:5,000 of Freiburg a. d. Unstrut, based on A – B along the river Unstrut, points of view: I – VI, VI = A.

presented the "application of photography to architecture and terrain mapping." (21)

Meydenbauer cites two areas of application for the new art of measurement: the restoration of buildings, especially façades—and the surveying of terrain for the construction of roads, canals, and railroad lines. The aim of his projects in the service of the German Reich was to open up unknown territory for infrastructure. In this respect, they resemble today's data collection of migrants. Meydenbauer emphasizes that it is not the mathematics of these topographies that is important, but rather the possibility of visualizing the measurement data: "With regard to the accuracy that can be achieved by means of photometrography, one must always remember that one is never working towards a result that can be expressed in numbers, but always towards a graphic one." (22) Conditions and behavior—especially in the face of danger—can be grasped more quickly on the basis of images. Therefore, data would have to be transformed into images and ideas. Meydenbauer invents measuring devices that generate an endless series of numbers and machines that transform them into graphics and diagrams, thus giving technicians more time for inventions:

> What is photometrography other than the expression of the effort, which has appeared so often in recent times, to replace the most laborious mental work, mechanical calculation, by graphic construction? It only wants to save us work, to make it possible for us to use the forces at our disposal in a more versatile way, and to free the aspiring technician from the necessity of blunting their ambition with endless series of numbers. (23)

The organization of data is delegated to algorithms. Meydenbauer conceived of creative engineering, not number crunching. The similarity of photography is replaced by a new diagrammatic similar to photogrammetry, but the what is produced are still figurative, shapes, or profiles. This will change only in the 20th century when the devices for photogrammetry, theodolites in all forms, become increasingly powerful, smaller, and handier due to better optics. (24) Even in World War One they are mobile and are used for aerial reconnaissance.

These recording devices belong to the genealogy of surveying techniques with which the physical world in all its hazards and dangers can be safely recorded as data, then turned or returned into three-dimensionality, transferred to virtual worlds, and eventually processed in such a way that it is possible to navigate in them. In these worlds, which may not even resemble the physical ones very much, useful infrastructures can be marked as paths and further information can be deposited. The very complex form of such data processing as virtual surveying and surveillance is now built into our everyday mobile devices as a default. We have also used them to build the virtual world of *Amitié*.

4. Scanning and Reconfiguration

We generated the virtual world as a pictorial realization of data structures for our film using data and numbers that we recorded with a contemporary version of photogrammetry: the LiDAR (Light Detection And Ranging) scanner, which uses technology for remote sensing. (25) The LiDAR camera, actually a laser echo sounder, breaks down

(21) See Albrecht Meydenbauer, "Die Photometrographie," *Wochenblatt des Architekten Vereins zu Berlin* 1, no. 14 (1867): 125–26; no. 15 (1867): 139–40; no. 16 (1867): 149–50. Quote from no. 14 (1867): 125.

(22) Meydenbauer, "Die Photometrographie," no. 16, 149.

(23) Meydenbauer, "Die Photometrographie," no. 16, 149–50.

(24) See Sigi Heggli, Klaus Neumann, and Eugen Voit, "100 Jahre Photogrammetrie-Innovation aus Heerbrugg," *PFG—Journal of Photogrammetry, Remote Sensing and Geoinformation Science* 89 (2021): 447–59, https://doi.org/10.1007/s41064-021-00166-9.

(25) Pinliang Dong and Qi Chen, *LiDAR Remote Sensing and Applications* (Boca Raton, FL: CRC Press, 2017).

all objects into polygons, relates them to spatial parameters, and then saves them as 3D models. Both the photorealistic surfaces and their position in space are stored and combined so that the resulting 3D views can then be rotated, flipped, and further processed: Meydenbauer's Photogrammetry 4.0. We used it to scan the film's locations, that is to turn them into data clusters, but we also scanned adjacent landscapes, especially infrastructures—roads, train stations, port facilities, mountain paths and trails. In the tradition of photogrammetry, the LiDAR scanner is a surveying technique refined in the course of its military-industrial production that uses pulsed laser-echo beams to spatially measure the distance to objects, including moving ones, and convert them into three-dimensional images. Developed first as part of colonial and war strategy for aerial mapping and building detection, LiDAR scanning was used spectacularly to survey the lunar surface by the crew of Apollo 15. Today, LiDAR also organizes civilian life. It is used by architects in manufacturing, or to help smart vehicles to get an image of the surrounding world in motion while securing the route and speed of their own contactless journey through traffic. (26) The more the military and industry invest, the cheaper the system, which in principle reunites the two media techniques of photography and photogrammetry.

In the case of our film *Amitié*, the data arrays obtained in this way were assembled into a three-dimensional virtual reality with the help of a game engine, in this case the *Unreal Engine*. (27) On the one hand, this motif exhibits a model for possibilities of action—for *Amitié* is not an actual functioning communicative platform on the net, but rather an imagined representation of such a platform in a film. We have used the technology of surveying and transferring data into three-dimensional image worlds with all their military-industrial genealogies and implications for an optimistic, utopian fantasy: to provide access to a collectively networked knowledge, a *mobile commons*, in which people in danger and distress—as in Meydenbauer's case—could orient themselves. In the film, these image worlds are clearly marked as rough computed data; they appear as frayed, fragile, and fragmented environments. The particular places and infrastructures are recognizable and topologically connected, just as the pieces of information are linked, but they do not render a topographically coherent and ordered world. Rather. They are useful image-data-clusters. In this respect, *Amitié* also resembles a neuronally activating memory of the world, in which the forgotten overlooked or ignored have yet to be entered.

In this tinkered virtual world, people's messages become not only visible as visualized data, but also audible on the soundtrack as voices, as fragments of sentence and as choruses in a Brechtian mode. The different layers and levels of realities in the transmission draw attention to the different forms of data processing—images, sounds, light, and voices are all data-generated—and thus intentionally avoid any impression of the authentic. And finally, the artificial virtual world is not just a replacement or representation of the actual material world, but it can also point to media and technical procedures that challenge the real world in its effects. As Bruno Latour remarked in 1983: "Impossible palaces can be drawn realistically, but it is also possible to draw possible objects as if they were utopian ones." (28) In the relation between data and images, it is not the distinction

(26) See Gerd Rudolph and Uwe Voelzke, "Three Sensor Types Drive Autonomous Vehicles," *Fierce Electronics*, November 10, 2017, https://www.fierceelectronics.com/components/three-sensor-types-drive-autonomous-vehicles.

(27) This work was realized for the film by VR artist Moses Holl. The transformation of data into 3D virtual image worlds according to hundreds of parameters is difficult and requires experience and patience. Presumably, however, this transfer will be automated and accelerated in the future. To know its functions is all the more important.

(28) Latour, "Visualisation and Cognition," 8.

between fiction and reality that is crucial, but the knowledge of data processing and the access to it.

But can we imagine other behavior under data-based forms of imaging than those in the service of hostile ontologies? (29) How do metrographic practices and hostile ontologies relate to each other? Should we expect algorithmic image processing and neoliberal marketing to turn all the data our behavior generates over the course of our days against us, or can more cunning calculations be made? Perhaps we should first understand current forms of behavior as a very complex navigation between data and image worlds, both of which are always also materially processed.

(29) See Peter Galison's objection to social cybernetics: Peter Galison, "The Ontology of the Enemy: Norbert Wiener and the Cybernetic Vision," *Critical Inquiry* 21, no.1 (1994): 228–66.

5. Operative Images

That images should no longer only represent pictorial or figurative similarities, but also count as images when they convey forms of similarity of behavior, was posited by cyberneticists who explored homologies in the behavior of humans and machines in the 1940s. Circuits and transmissions control communication function according to the fundamental thesis of interdisciplinary and transdisciplinary research, in the same and comparable way to living beings and machines, even if they do not resemble each other in appearance. To test this assumption, Norbert Wiener built a double-feedback cart made of real wood, wire, and steel on three rubber-tired wheels, which he named *Palomilla* because it behaved like a little moth. The cybernetic bug could independently steer itself toward light sources, even if they were moving. But the circuits of behavior could also be switched, so that the moth behaved like a bug and fled the light. Therefore, Wiener considered the mechanical sculpture as an operative image of an insect. Later, in his reflections on the metaphysical effects of his experiments, he wrote in his book titled *God and Golem, Inc*.:

> Thus, besides pictorial images, we may have operative images. These operative images, which perform the functions of their original, may or may not bear a pictorial likeness to it. Whether they do or not, they may replace the original in its action, and this is a much deeper similarity. It is from the standpoint of operative similarity that we shall study the possible reproduction of machines. (30)

Operative images simulate behaviors, and since then cybernetics has never been about the nature of images or things, nor about ontologies, but about operativity. What is decisive is not what images are, but what they do and how they behave. Not least in their attitude to a master. This is where Harun Farocki's cinematic argumentation comes in: Farocki points out that the notion of representative images only distracts us from the fact that images always perform operative functions as well. In 2003, on the occasion of an exhibition of his installation *Eye/Machine III* at the ZKM in Karlsruhe, Germany he stated:

> If we take an interest in pictures that are part of an operation, this is because we are weary of non-operative pictures, and weary of meta-language. Weary of the day-to-day practice of re-mythologizing quotidian life, weary of the ever-changing and many-channelled program of images custom-made to mean something to us. (31)

In the *Eye/Machine* series, Farocki explored the intertwining of data collection and imaging in the production and control of weapons, and

(30) Norbert Wiener, *God and Golem, Inc.: A Comment on Certain Points where Cybernetics Impinges on Religion* (Cambridge, MA and London: MIT Press, 1964), 31. I thank Markus Krajewski for pointing out this passage.

(31) Harun Farocki, "Phantom Images," trans. Brian Poole, *Public* 29 (2004): 12–22, here 18.

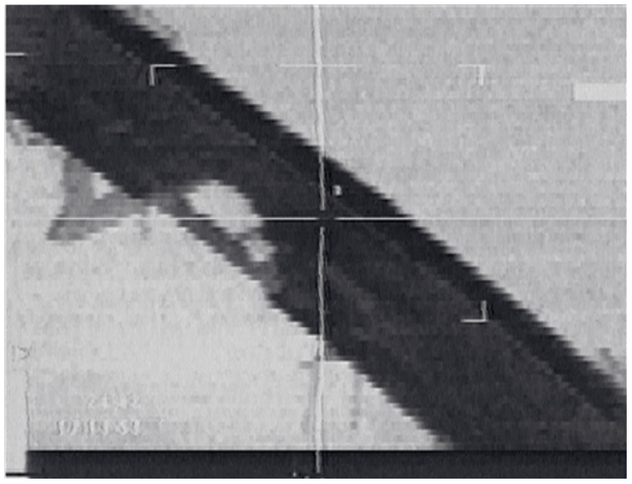
their genealogy in rocket and television research during German fascism (figs. 4–5). However, he cast doubt on the perfection of visual data-processing in which missiles were pronounced capable by television news in 2003. Farocki assumes that the image-guided rockets or bombs were still futuristic fantasies at that time: "[…] everything seems to support the theory that in both Gulf wars there were no intelligent weapons, none that could seek out and hit its target on its own." (32) Television, which suggested in its reports, that these camera-equipped rockets were self-steering and self-controlled, thus only dreamed of its own historical alliance with the "filming bombs" as Klaus Theweleit had called the aggregates of 1991. The images produced however gave evidence that rockets always inevitably maneuvered themselves into sheer blackness, out of the light, to where an enemy target would appear *ex negativo* to TV viewers. (33) The impressions of hostile targets formed by millions of audience members were based on nothing but a black square.

(32) Farocki, "Phantom Images," 21.

(33) Cf. Farocki, "Phantom Images," 15.

In his film essay *Images of the World and the Inscription of War*, Farocki had already examined the common history of imaging systems and warfare, and he set out from the double meaning of the term "enlightenment" as an epistemological and as a military strategy. Thus, he raises the question of how knowledge and agency, recognition and intervention are connected considering media conditions. But he also points to the blind spot of not-knowing or the unknowledgeable, of missing information inherent in every image analysis and thus a condition of agency: to act ideally as if image worlds were based on nothing. In his film, Farocki recalls how image recognition and reading techniques by US photograph analysts allowed the CIA to study the production sites of IG Farben closely while overlooking the nearby concentration camp Auschwitz, which was depicted in the same photograph.

In his films, Harun Farocki not only examines forms of image processing in the context of war, but historic and systematic forms across many fields of knowledge production: he studies the transfer of images into measured values, for example, in Albrecht Dürer's experiments with central perspective; and the transformation of measured values into images, as mentioned, in 19th-century photogrammetry. What gets lost, for Farocki, in the practices of technical measurement and imaging is a moment of experience as a possibility for critique, which proved to be a political problem in the 1980s when Farocki was working on his film. The first personal computers were making their way into everyday lives at the time. They were black boxes for users struggling with programs and graphical interfaces, with understanding the operations of graphics and images generated from numbers and algorithms, unable to program them themselves. Endless training sessions on the computer screen subjected them, made them subjects of technology. Users trained the coordination of their hands, eyes, and a technical mouse without knowing how the three elements of the visual, the haptic, and reaction-times had been coordinated in a long experimental history of interface programming. They did not know how human eyes and hands and the behavior between them had changed in the course of 20th-century experimentation and laboratory training. In the face of this new form of illiteracy, Farocki's films self-reflexively showed how images are made and what images can do. Intelligent machines, computer programing,



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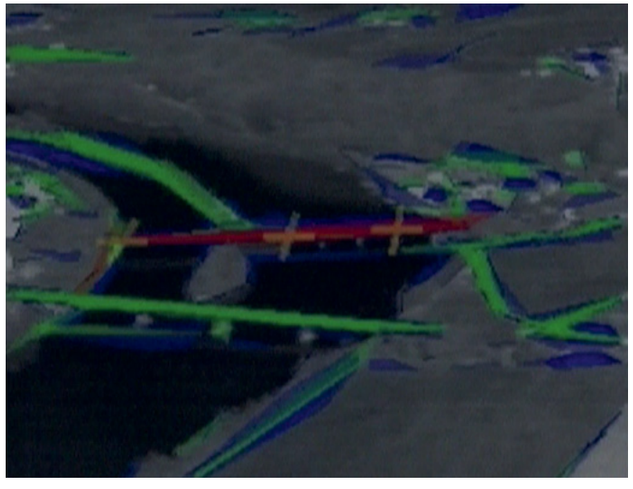

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figs. 4–5 Harun Farocki, *Eye/Machine*, 2000, BetaSP video, color, 23 min (loop). © Harun Farocki, 2000.

and data collection, Farocki reminds us in 1988, are not infinite extensions of knowledge or intelligence, but much rather filters. Filtering is a prerequisite for knowledge, but only if people can make use of their devices without being guided by another, to paraphrase Immanuel Kant's concept of enlightenment and intelligence. This is where Farocki's educational films (*Aufklärungsfilme*) about technical images come in, but they always start from an analysis of images, not of the numerical or digital.

In the title of his film, Farocki evokes Martin Heidegger's essay "The Age of the World Image," taken from a question Heidegger asked in his 1938 lecture on the modern period: "What is that—a world image? Obviously a picture of the world. But what does world mean here? What does image mean?," (34) Farocki answered with a film title that put first the image in the plural and then tied it to the media-technical conditions of its production: *Images of the World and the Inscription of War*. Farocki's film essay shows the extent to which cameras, recording devices, and development processes, but also readings of images as visualized data, especially cartographic ones, go back to practices of measuring, surveying, and territorial appropriation, to strategies of identification and eventually to producing an image of the enemy (*Feindbild*). To this end, all he has to do is follow Heidegger, who in 1938, just in time for the prelude to new conquests, had declared: "The basic process of modern times is the conquest of the world as an image." (35) Fifty years later, just as the Anglo-Saxon apparatus theory of cinema emerged, which analyzed not the content of images but the process of projection itself as a power relation, Farocki began to investigate operations of data-generated images beyond the cinematic. (36) While Heidegger understood the modern image as a conception, as a "formation of imaginative production," (37) adding "that the world becoming an image is one and the same process as the person becoming a subject within the being," (38) Farocki argued that such imagining—which he included television—is not just productive, it is also the medium of unimaginable destruction. The world image for Farocki is a balance of forces of operations that were formed and defined by the technology of World War Two.

Heidegger's concept of *Vor-Stellen* (*imagining*, but also *placing ahead*) continues to be perpetuated in 2022. Therefore, this trajectory should be outlined before returning to the friendly vision of data-based imaging. Projection—if we take this translation of *Vor-Werfen* (*throwing ahead*) as analogous to *Vor-Stellen*—is indeed still central in military terminology. As Grégoire Chamayou reminds us in his study on the effects of drone warfare, in the history of the military, "projecting power" always meant "sending in troops." (39) Chamayou cites the testimony of a US Air Force officer to make clear that this notion of projection has once again taken on a different meaning under conditions of missions executed by drones, referred to as the unmanned aerial system (AUS). Drones can operate autonomously because they are controlled by data and media transmissions, steered within real worlds, without the need for vulnerable pilots to be present: "The real advantage of unmanned aerial systems is that they allow you to project power without projecting vulnerability." (40) Drones are not only a problem of new visibilities, they also reorganize the relationship of friend and enemy. According to

(34) "Was ist das—ein Weltbild? Offenbar ein Bild von der Welt. Aber was heißt hier Welt? Was meint da Bild?" Martin Heidegger, "Die Zeit des Weltbildes," in *Holzwege* (Frankfurt am Main: Vittorio Klostermann, 1977), 75–113, here 89.

(35) "Der Grundvorgang der Neuzeit ist die Eroberung der Welt als Bild." Heidegger, "Die Zeit des Weltbildes," 94.

(36) See Teresa de Lauretis and Stephen Heath, eds. *The Cinematic Apparatus* (Milwaukee: University of Wisconsin Press, 1980).

(37) "Das Wort Bild bedeutet jetzt: Gebild des vorstellenden Herstellens." Heidegger, "Die Zeit des Weltbildes," 94.

(38) "Daß die Welt zum Bild wird ist ein und derselbe Vorgang mit dem, daß der Mensch innerhalb des Seienden zum Subjectum wird." Heidegger, "Die Zeit des Weltbildes," 92.

(39) Grégoire Chamayou, *A Theory of the Drone* (New York: The New Press, 2015), 12.

(40) Chamayou, *A Theory of the Drone*, 12.

Chamayou, drones introduce a new form of radical enmity not only for their pilots but for all citizens of a state that uses armed drones. This is the exact opposite of the data-image worlds of an equally projected or rather constructed *amitié*. But not as a simple reprogramming, a switching from moth to bug behavior, as in Norbert Wiener's model, but as an extension of the contexts in which thinking takes place, of framings, of considerations, of attention to complexity. Nevertheless, we must acknowledge the fact that behavior is based on computations between data and images that implement teleologies but are more complex than we may think or know.

In our film, we constructed access to virtual reality with the help of the cheap, sturdy Google Cardboards (fig. 6), produced as gadgets and giveaways in the wake of FOV2GO to generate stereoscopic images on an iPhone equipped with open-source software. We decided to do so, although it was clear that these boxes too were the result of research coordinated between California film schools, Silicon Valley, the military, and NASA's Ames Research Center, "a fertile space for experimentation across a spectrum that included military, consumer and artistic applications." (41)

Through the operational surfaces of imaging in our film we continued to be connected to this "space for experimentation." Can we learn to use the gadgets and devices, which we depend on to navigate between images and data in the physical world, to access administrations, or to film something less hostile? Can we learn to consider "all mankind as our own skin," (42) as Marshall McLuhan understood it in 1964, the same year as Norbert Wiener placed his theory of operative images within the context of religion and myth? What does this mean for a behavior that is not, as current algorithms want it, based on competition and enmities, but on cooperation or even on political ecology in Latour's sense of the term?

(41) Anderson, *Technologies of Vision,* 204.

(42) See Marshall McLuhan, *Understanding Media: The Extensions of Man* (Cambridge, MA and London: MIT Press, [1964] 1994), 47: "In the electric age we wear all mankind as our skin."

6. What Do We Do, How Do We Behave?

Operative images generate not only single operations or actions, but shape behavior as a whole. They operate not only in the sense of switchability, as in the case of Norbert Wiener's cybernetic animals, nor in the sense of economic and military teleologies, but much rather as transmissions that integrate physical reality and digitized data sculptures. In this sense, they are more than interfaces between data and images and provide, in the sense that McLuhan had thought of it, a universal skin for humankind. The traffic between data and behavior is mostly smooth: we take in data as images, move in data spaces, deliver data via touchscreens to institutions or corporations that distill patterns from it and know more about us and our desires than we ever could ourselves. Computer simulations enable the operativity of images as intervention into worlds, as Albrecht Meydenbauer conceived of when founding the Königlich Preußische Messbild-Anstalt. With the current speeds of digital data processing however, operations based on fractal or granular measurements cannot only describe behavior but become predictions of choices, decisions, actions. Even in the times of Louis Daguerre and Henry Fox Talbot, Lisa Gitelman has termed this machinization of behavior a "displacement of human agency." (43) Can this agency be reappropriated in times of danger, despair, and distress at the fringes of our subjectivity by turning it into emancipation or something revolutionary, as suggested by the virtual model in the film *Amitié*?

(43) Gitelman and Jackson, "Introduction," 5.

From the studies of the nethnologists, we also see those who navigate beyond digital gaps and divides with ease, and between data and other material realities. But the real cybernetic problem has not yet been solved. We are not all in the same boat. Scanning the world and organising behavior consumes resources, so that we are actually changing the world, exploiting it, heating it up, while we are virtually making and projecting a picture of it. Heidegger's revenge. As Sean Cubitt writes in the chapter "Energy" of his book *Finite Media*:

> Perhaps the most intriguing, even ominous, aspect of near-future scenarios is ubiquitous computing, combining the Internet of things with the increasing integration of mobile wireless and Internet media [...] creating a vast demand for new storage and communication services. (44)

Cubitt also adds that the Anthropocene is not an equally distributed exploitation of resources and energy consumption, but a distribution according to social, geographic, and class relations: "The global poor suffer far more from pollution and environmental loss than the global rich; and much the same is true for the local poor and the local wealthy." (45) The data to prove this exists. Perhaps it has to be visualized differently. The virtual reality of *Amitié* we have constructed for the film has long existed as networks of communications and transmissions, topologies of data produced during migration and among people *en route* (fig. 7). What we do not usually see are the virtual or visual worlds created from it. Probably, to make *Amitié* is first of all to learn to operate with data-processed images.

(44) Sean Cubitt, *Finite Media: Environmental Implications of Digital Technologies* (Durham, NC: Duke University Press, 2017), 20.

(45) Cubitt, *Finite Media*, 14.

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fig. 6 Photo on the film set of *Amitié*, 2022. © Didi Danquart.
fig. 7 Ute Holl and Peter Ott, *Amitié*, 2022, color, sound, 108 min, film still.

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Images as Measuring Devices
Harun Farocki's *Images of the World and the Inscription of War*

Volker Pantenburg

I.

In February 1982, at the 32nd Berlin International Film Festival, Ronny Tanner and Harun Farocki staged a short, improvised performance in the foyer of the Delphi cinema in West Berlin. Tanner was one of the actors in Farocki's film *Before Your Eyes: Vietnam* (1982), which was shown as part of the festival's Forum program. In the film, Tanner plays an US pilot whose plane has been shot down and who has been taken prisoner by North Vietnamese soldiers. Farocki's role in the performance—as he informed the audience in a short introduction—is to represent a crowd of Vietnamese children surrounding Tanner and ask him questions (fig. 1).

The material, shot and preserved on 16 mm reversal film stock in a film can labeled "Ronny und Harun spielen Theater" (Ronny and Harun Act Up), was one of the first pieces of media the Harun Farocki Institut, established in 2015, decided to digitize.(1) Together with various pieces of documentation—among other things, photographs, a promotional folder designed by Farocki and the distributor, urban graffiti and other methods of "guerrilla marketing," an early version of the script, and a preliminary storyboard—it provides one possible starting point from which to investigate the specificities of the film's production and distribution history.(2) Only later did it become evident that Farocki and Tanner's performance at the Delphi was not only a re-staging of a quintessential sequence in the film but also an accurate theatrical adaptation of the existing trailer of the movie. Moreover, one of the two posters promoting the film also included the dialog between the pilot and the Vietnamese children. The performance was thus just one element in a concerted PR campaign conducted through official and unofficial channels.

In the sequence, the pilot (Tanner) explains the US military operation he was part of: "A plane takes an aerial photo of a village. One month later, it takes a second photo, and we compare the images." The difference between the two images reveals not only whether a village was "successfully" (to use military lingo) bombed but also more minute details. For instance, it allows one to distinguish between different imprints of soldiers' boots and draw far-reaching conclusions: "This one shows an imprint of a 'Pneu Michelin' tire. This one is a 'Goodyear' tire. My current hypothesis: Veterans from Viet Minh times wear 'Michelin,' recruits from the last ten years wear 'Goodyear.' From the depth of the imprint more things could be deduced: How long does a tire-sandal last? On city streets, on

(1)
"Ronny und Harun spielen Theater" (Ronny and Harun Act Up), 1982, 16 mm reversal film, color, magnetic tape, 6 min, 2K digitization by the Harun Farocki Institut, October 2016.

(2)
Some of this material was published in an issue of the institute's booklet series: Harun Farocki, *Before Your Eyes—Vietnam: Commentary, Document, Material*, ed. Tom Holert (Berlin: Harun Farocki Institut and Motto Books, 2017) [HaFI 005].

soft soil, on rocky surfaces? We could draw further conclusions about length in the service, mobility, and mortality (fig. 2)."(3)

With his later film *Images of the World and the Inscription of War* (*Bilder der Welt und Inschrift des Krieges*, 1988) in mind, one recognizes key elements of Farocki's approach: his focus on photography and, more precisely, aerial reconnaissance and its capacity to identify and control; the act of conducting an analysis based on the comparison of two images, which is the matrix of algorithmic pattern recognition; and the principle of "soft montage," which characterizes Farocki's later installations.(4) In this particular case, Farocki appropriates the expertise of military intelligence to learn from the enemy—a common guerrilla tactic. The performance culminates in the pilot's confession that he has stopped being a soldier and has become a philosopher: "Philosophy asks: What is man? I ask: *What is an image*?" Quite obviously, this characterization can easily serve as a self-portrait of Farocki (fig. 3).

In reflecting on this short sequence and relating it to the problem of *measuring*, other implications of Farocki's premises and preoccupations come to light. Above all, the soldier's argument about aerial reconnaissance is entirely based on an act of measuring. He performs a remote analysis based on photographic evidence rather than the personal account of an eyewitness. Comparing the specific prints left by different kinds of shoes made of tires is quite literally an example of pattern analysis. The two photographs are not methodically considered primarily as iconic formations but as a set of data from which a historical argument about the Vietnamese troops can be deduced.

Hence, Farocki confronts us with a specific kind of media forensics that consists of two components: an instance of machine vision (the remote aggregation of data, an early form of photographic *detection*) and the hermeneutic process of forming a hypothesis, extrapolating, and drawing conclusions. What the camera has registered and recorded from a considerable distance is subsequently evaluated by the military detective, who scrutinizes the details as closely as possible. Thus, an intricate dialectic between measuring and interpreting (mathematics and hermeneutics) and distance and proximity is triggered. Moreover, when we relate the clip to *Before Your Eyes: Vietnam* and other paratextual material surrounding the film, it involves us, the observers, in two different kinds of forensics: In terms of content, we are confronted with the forensic method displayed and discussed in Farocki's film and the Delphi performance. In terms of the material artifact, we benefit from the forensic data offered by the archival material. In Farocki's work, which often draws from existing footage from various sources, both modes—one could say, first- and second-order forensics—are inextricably intertwined.

II.

Entering the archive, one encounters a plethora of different formats. While this is true for every archive, audiovisual collections present particular complications. Media technology and its standards are subject to constant change. Despite the false promises of a digital world of all-encompassing convertibility and immediate access, the frequency of changes and cycles of obsolescence has accelerated rather than slowed.

(3)
Harun Farocki, *Before Your Eyes: Vietnam*, 1982, 35 mm, b/w.

(4)
See Harun Farocki's essay "Cross Influence / Soft Montage," [2002], trans. Cynthia Beatt, in *Harun Farocki: Against What? Against Whom?*, ed. Antje Ehmann and Kodwo Eshun (London: Koenig Books 2009), 69–74.

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figs. 1–3 "Ronny und Harun spielen Theater," 1982, 16 mm reversal film, color, magnetic tape, 6 min, 2K digitization, October 2016. © Harun Farocki GbR.

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figs. 4–5 HaFI archive, January 2016. © Filipa César / Louis Henderson.

The Harun Farocki Institut's collection primarily comprises film and video material along with numerous issues of the journal *Filmkritik*, which Farocki co-edited and contributed to between 1974 and 1983. When there was no longer enough room to store the issues in the archive, he took them into his custody, saving them from being discarded. In our small archival space, which is part of the much more extensive analog archive of the Arsenal – Institute for Film and Video Art in Wedding, Berlin, (5) we hold more than 300 items: a panoply of 16 and 35 mm film; U-matic, Betamax, VHS, and DigiBeta tapes; and audiotapes and sound material from roughly 1966 to 2009 (figs. 4–5). It is a media archaeological museum of sorts, in which 16 and 35 mm material has ironically proven to be the most accessible media thanks to the robust Steenbeck editing tables housed at the adjacent Arsenal. Watching videos in various formats—from U-matic via Betamax and Betacam SP to early digital formats—is much more complicated, as we lack compatible viewing devices. Since archival practices and the dialectics of visibility and invisibility have always been at the center of Farocki's work, our work is intimately connected with his.

What distinguishes the collection is that it does not hold Farocki's finished works—these remain in the custody of the Farocki Estate and Antje Ehmann (though we do have viewing copies of his films). Instead, it comprises all kinds of working material surrounding his films. For example, we hold many VHS tapes containing archival research for Farocki's projects such as *Workers Leaving the Factory* (*Arbeiter verlassen die Fabrik*, 1995), *The Expression of Hands* (*Der Ausdruck der Bilder*, 1997), and *Prison Images* (*Gefängnisbilder*, 2000); unused material shot for various projects; and screen tests of auditioning actors rehearsing lines from films (figs. 6–8). In short, it is a very peculiar and haphazard collection, which might more appropriately be called a *para-archive*. Owing to Farocki's untimely and sudden death at the age of seventy, the collection lacks a systematic plan. The para-archive's material foundation was, quite simply, all the material Farocki had decided to keep in a particular storage space, in which it was shelved in cardboard boxes and plastic bags and roughly organized by project. From the point of view of the Harun Farocki Institut, our focus on the para-archival domain is not a deficit but puts us in a luxurious situation: we can devote our (limited) time and energy to examining the production background and circumstances of Farocki's work while his family sees to its exhibition and distribution. More established and professional institutions, such as the Deutsche Kinemathek and Matthias Rajmann and Claus Üblacker's company, Film Shift, (6) take care of the preservation, digitization, and long-term storage of his oeuvre.

The clip "Ronny und Harun spielen Theater" exemplifies the kind of material held at the Harun Farocki Institut. While it is not a film by Farocki, its interesting position on the fringes of *Before Your Eyes: Vietnam* reveals a document that speaks of many things at the same time: Farocki's precarious working conditions; his marginal position within the German film industry, which made him resort to various methods of guerrilla marketing; the Situationist traces in Farocki's work and certain segments of the West German Left; and Farocki's great interest in a specific inflection and adaptation of Carl Schmitt's typology of the "partisan" at that time. (7)

(5) The Arsenal archive, the Harun Farocki Institut, and several other cultural institutions are located in the Silent Green Kulturquartier, a cultural center in the former crematory of Berlin's Wedding district.

(6) Matthias Rajmann had been one of Farocki's most important collaborators since 2001, organizing productions and working as a researcher and sometimes a sound designer on many of Farocki's films and installations. The process of digitizing and restoring Farocki's works began during the filmmaker's lifetime. After his death, Rajmann founded Film Shift and quickly became an expert at digitization, restoration, and mastering.

(7) See Harun Farocki's essay "Hund von der Autobahn," first published in *Filmkritik*, no. 301 (January 1982): 5–32, which contains much of the research conducted for *Before Your Eyes: Vietnam*. Harun Farocki, "Dog from the Freeway," trans. Laurent Faasch-Ibrahim, in Harun Farocki, *Nachdruck / Imprint* (New York and Berlin: Lukas & Sternberg, 2001), 112–70.

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figs. 6–8 Screen tests for *Before Your Eyes: Vietnam*, ca. 1980, 16 mm, b/w, magnetic tape, 16 min, 2K digitization, June 2019. © Harun Farocki GbR.

III.

Exploring the holdings in the para-archive and gaining a better understanding of the material background of Farocki's films has added an archival perspective to the ever-growing body of literature on the filmmaker. In the following, I would like to draw from some of the premises and peculiarities of this archive in examining one of Farocki's most researched works: *Images of the World and the Inscription of War*, a film that centers around the nexus between image technologies and the practice of measuring. In no other of Farocki's films is the focus placed more squarely on the ambivalence—or better dialectics—of enlightenment and its primary tool of quantification by means of measuring. Not surprisingly, in his seminal monograph, Eyal Weizman cites Farocki's film as one of the prototypes of "forensic architecture."(8) Unfortunately, Farocki and Weizman's idea of a joint project inspired by the *Forensis* exhibition at the Haus der Kulturen der Welt, Berlin in early 2014 had only started to take shape when the filmmaker died a few months later.

(8) See Eyal Weizman, *Forensic Architecture: Violence at the Threshold of Detectability* (New York: Zone Books 2017), 18–19.

Viewing *Images of the World* from an archival perspective means confronting the film with some of the paratextual material created around it, specifically during the research phase, when the project was beginning to take shape and Farocki was looking for funding, and during the production itself. *Images of the World* brings together a broad spectrum of activities, gestures, and operations, which, in one way or another, are all related to vision. Alternating between still images accompanied by a female voiceover and moving images shown without any spoken explanation, Farocki weaves a complex visual and discursive pattern. The audaciousness of the filmmaker's proposition lies not only in the scope of material he brings together but also in his method of establishing the proximities and distances between these elements. He associates coordinates that are far apart from each other, producing, as Hal Foster called it, a "genealogy of visual instrumentality."(9) The material in the film ranges from Albrecht Dürer and the development of linear perspective (fig. 9) to the simulation technology of the 1980s (fig. 10) and encompasses a heterogeneity of images, including drawings, photographs, composite images, and synthetically generated simulated worlds. It also programmatically oscillates between civilian and military forms of use, between the destructive forces of war and violence and the opposing aims of production and preservation (figs. 11–12). Implicitly or explicitly, the act of vision is always embedded in different constellations of power and violence. However, within this vast array of image practice and theory, a few episodes and concepts stand out.

(9) Hal Foster, "Vision Quest: The Cinema of Harun Farocki," *Artforum* (November 2004): 157–161, here 159.

Firstly, there is Albrecht Meydenbauer's invention of photogrammetry in the 1850s, a method that facilitated the production of scale images from photographs, replacing the risky practice of collecting measurements on site. Starting with the scale measurement of buildings and facades, Meydenbauer became a foundational figure in establishing the Königlich Preußische Messbild-Anstalt (Royal Prussian Photogrammic Institute). *Bilderkrieg*, an early forty-five-minute version of *Images of the World* made for WDR in 1987, starts with a pivotal moment in the history of photogrammetry: a eureka moment that occurred in 1858, when Meydenbauer, while dangerously suspended in the air measuring a facade, first had the idea to use photographs to create scale measurements. In the later seventy-

five-minute version of the film, a three-minute sequence consisting of eleven different shots is added, the majority of which were made in Hannover's Wellenkanal, a laboratory investigating the movement of water (fig. 13). The shots are accompanied by a poetic voice-over that hovers between a concrete description of what we see and a self-reflexive allegory of the discursive and intellectual motion in the film that follows:

> When the sea surges against the land, irregularly, not haphazardly, this motion binds the look without fettering it and sets free the thoughts. The surge that sets the thoughts in motion is here being investigated scientifically in its own motion—in the large wave channel at Hannover. The motions of water are still less researched than those of light. (10)

Embedded in these shots is footage from a surveillance monitor showing a simulation of a ship entering the port of Hamburg. Farocki also repeatedly cuts away to footage of a makeup model he shot fifteen years earlier for his film *Make Up* (1973) (fig. 14).

With the addition of each of these shots and layers, the concept of measuring is expanded and made more general. While the Meydenbauer sequence defines a crucial moment in the encounter between visual registration and quantification, between image technologies and measuring devices, the visual component of *Aufklärung* ("enlightenment," but also "reconnaissance") is integrated into a larger framework of *measurement* from the very beginning. It comprises the laboratory and the hard sciences, the transformation of a natural phenomenon into numbers and quantities, and the idea of models and simulations. At the same time, it also crisscrosses between the military and civilian domains. As Hal Foster argues, "the cumulative effect of his montage is such that we can no longer hold humanist uses of seeing, measuring, and imaging apart from military-industrial-bureaucratic abuses of such techniques." (11)

Extrapolating from Gilles Deleuze's writings on the diagrammatic, Raymond Bellour invoked the notion of the "photo diagram" as a useful term in his analysis of *Images of the World*. (12) However, Vilém Flusser's concept of the "technical image," a notion Farocki later picked up and expanded in his considerations on the "operational image," plays an equally important role. (13) According to Flusser, the photograph is the first type of image that must be thought of as a "technical image." Even though it is made up of grains and not pixels, its basic components are discrete elements that can be mathematically counted and thus calculated: "The point is that all technical images have the same basic character: on close inspection, they all prove to be envisioned surfaces computed from particles." (14)

Another gravitational center of Farocki's film—and arguably its most powerful—are the photographs of Auschwitz and other material (including inmates' drawings of the extermination camp and a secret code they developed) from the camps. Meydenbauer's façade returns in the idea of the *face* of the earth and in the question of what objective facts can be deduced from a photograph, in this case an aerial photograph taken from an American reconnaissance plane in 1944. Farocki (and the camera) inspects these photographs as closely as possible and, in this proximity, is confronted with the "threshold of detectability" (Eyal Weizman). The closer he gets to the material properties of the image, the more the discernible shapes disintegrate (figs. 15–16). What becomes *visible*? What remains *undetectable*? The photographic grain and the limits of detectability render the subject of the gaze problematic: Are we still in the realm of *seeing* in the traditional sense? Or are other, non-human detectors better equipped to *sense* and calculate what has been registered? In an accompanying text, Farocki explicitly acknowledges this shift: "If one considers an image as a measuring device, then one should ignore chance and subjectivity. To conceive of a photographic image as a measuring device is to insist on the mathematicality, calculability, and finally the 'computability' of the image-world." (15) Once the era of "technical images" has started, the character of images drastically changes. As Thomas Elsaesser succinctly put it, "this new concept of the image regards it not as a picture or representation, but as the bearer of data and information." (16)

IV.

A document from an early stage in the production of *Images of the World*—found among the rare written material held in the Harun Farocki Institut's archive—substantiates the hypothesis that, apart from Hannah Arendt and Günther Anders, Flusser's theory of the "technical image" is a central subtext of the film. (17) A folder labeled "Bilder/Geschichte" (Images/History) contains drafts, budget calculations, location lists, correspondence, and other material from 1987 and 1988. The ten-page concept accompanying a funding application provides insight into what at that point was entitled "On the History of Work." Farocki's synopsis of the project reads as follows:

> An essay film on the history of the lathe. The turning device deserves a place in cultural history like that occupied by the pottery wheel and the loom. The oldest known illustration of a turning device comes from the third century B.C. in Egypt. Decorations and cannons in the Renaissance are the result of the further development of the lathe. The "industrial revolution" is unimaginable without it since the mechanically driven lathe made otherwise unattainable standardization and precision possible. A new chapter begins after World War II: machine tools are linked to calculating machines and the clamping and unclamping of tools and workpieces becomes mechanized. The age of the metal craftsman is over. He has left an impression on the labor movement. Labor now begins to lose its materiality; what that means is meant to be developed and discussed by the film. (18)

As Farocki's concept suggests, this history of the cultural technique of "turning" was to be interwoven with sequences portraying three different people and intellectual positions: the first was to be Flusser, whose reflections on post-history and the relationship between image and text were to be discussed in parallel to the history of labor; the second was to be writer and blacksmith Georg K. Glaser; and the third was to be an anonymous metalworker named Jochen S.

There is a considerable gap between this draft and *Images of the World*. Farocki omitted Glaser from the film, opting instead to devote another program exclusively to him—*Georg K. Glaser: Writer and Smith* (1988)—which can be read as a companion piece to *Images of the World*. Flusser's impact remains implicit and is much more visible in *As You See* (1986) and *Catch Phrases – Catch Images*

(10) Harun Farocki, "Commentary from *Bilder der Welt und Inschrift des* Krieges," *Discourse* 15, no. 3 (Spring 1993), 78–92, here 78.

(11) Foster, "Vision Quest," 59. For a recent perspective on the relation between image-making and measuring see Tomáš Dvořák and Jussi Parikka, "Measuring Photographs," *photographies* 14, no. 3 (2021): 443–57, here 444: "Cameras can do and also do much more than just take pictures for humans to look at, photography is a multifunctional family of technologies and one of its principal functions has always been to assist in measuring things. Its measuring function reciprocally interacts with its image-making function [...]."

(12) See Raymond Bellour, "The Photo-Diagram," in Ehmann and Eshun, *Harun Farocki: Against What? Against Whom?*, 143–51.

(13) Elsewhere, I have partly traced the background of this concept: Volker Pantenburg, "Working Images: Harun Farocki and the Operational Image," in *Image Operations: Visual Media and Political Conflict*, ed. Jens Eder and Charlotte Klonk (Manchester: Manchester University Press, 2017), 49–62.

(14) Vilém Flusser, *Into the Universe of Technical Images*, trans. Nancy Ann Roth (Minneapolis and London: Minnesota University Press, 2011), 33.

(15) Harun Farocki, "Reality Would Have to Begin," *Documents* 1–2 (Fall–Winter 1992): 136–46; reprinted in Farocki, *Nachdruck/Imprint*, 186–213, here 197.

(16) Thomas Elsaesser, "Harun Farocki: Filmmaker, Artist, Media Theorist," in *Harun Farocki: Working on the Sight-Lines*, ed. Thomas Elsaesser (Amsterdam: Amsterdam University Press, 2004), 11–40, here 30.

(17) In this and the following section, I return to thoughts I have elaborated on elsewhere. See Volker Pantenburg, "Conceptual Doubts: Harun Farocki's *On the History of Labor* Project," in Harun Farocki, *On the History of Labor: Document, Material, Commentary*, ed. Volker Pantenburg (Berlin: Harun Farocki Institut and Motto Books 2020) [HaFI 013], 20–31.

(18) Farocki, *On the History of Labor*, 12.

(1986), the latter a short conversation between Farocki and the philosopher on the occasion of the German publication of two of Flusser's books. Nevertheless, a substantial episode in *Images of the World* comprising a visit to the last operating metal pressing company, Grassme & Co., and a demonstration of this obsolete skill were included and can be traced back to this larger project on turning (fig. 17). The section on metal pressing is also an example of Farocki's exploration of the shift from manual labor and its gestures toward visual labor and automatization.

V.

Among the film material shot in the context of *Images of the World*, there are twenty minutes of footage labeled "Images/History," which we inspected at the editing table in May 2018 and decided to digitize in October 2019 (fig. 18). Unfortunately, apart from the working title, little information on the footage exists, and the film container is labeled simply "Muster / R5 / AntikenMuseum" (Model / R5 / museum of antiquities). We see a group of children gathered around two statues: one made of bronze and one of marble. They are assisted by an adult—probably a museum educator. Their location is the Collection of Classical Antiquities of the Staatliche Museen in Charlottenburg, Berlin. In the center is a blind girl, who carefully touches the statues' torso, arms, legs, and feet with her hands, sharing what she senses about the nature of the material and the forms (with the other children and with us, the spectators). We can only speculate as to why this material was not used in the finished film (figs. 19–22).

Various aspects of the sequence are particularly striking: first, it is worth noting that the sense of touch is categorically different from the sense of sight. As heterogeneous as the material in *Images of the World* is in historical and systematic terms, almost all the film's sequences relate to techniques of seeing and their capacity to measure and quantify. From Albrecht Dürer and the laws of central perspective, through the invention of photography and the development of photogrammetry in the 19th century, to the pattern recognition in automated industrial production processes and civil and military simulation, the film characterizes the history of vision as a history of the increasing distance between the observer and the seen object. In Dürer's perspective drawing *The Draughtsman of the Lute* (1525), the depicted object, the perspective grid (as a medium), and the draughtsman still fit into one small chamber (and hence one woodcut). The remote-control bomb in World War Two, on the other hand, already implies the concept of the drone. The act of seeing and its object are radically dissociated from the trigger and the act of image production. Distance, disembodiment, and mechanization go hand in hand. The educational scene at the Collection of Classical Antiquities presents a radical counterimage. Here, it is all about *not seeing*, blindness, and hence the proximity of touch and tactility, about gestures in which perception cannot be separated from subjects and their bodily presence. It also brings to mind another of Flusser's theoretical areas of interest: not the "technical image" but gestures. Farocki took up this thread again in *The Expression of Hands* (1997) and *Transmission* (2005), spinning it further in other directions.

It is also striking that this sequence features child protagonists, while the discourse of visuality in *Images of the World* is entirely set in the adult (and male-dominated) milieus of scholarship, computer science, and the military. As Nora Alter remarked in an early essay on the film, women appear as objects of the gaze (in nude drawings, composite images, and the photographs of Marc Garanger in Algeria), not as active subjects. (19) Touching as a countermodel to seeing is thus presented by actors who could be described as antagonists to the technocrats and forensic focus of police and military laboratories.

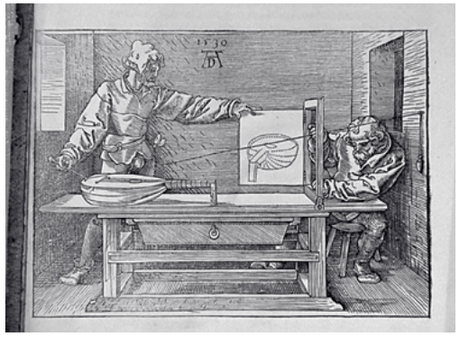
There are various reasons why Farocki may have rejected the idea of using this material in *Images of the World*—perhaps documents from his correspondence will shed light on this. On one hand, it may have been for the purely pragmatic reason that he did not find the right place for the material. Especially with the method of gradually accumulating and linking material this artistically exploratory process entails, entire complexes are often abandoned when the work's argumentative-conceptual direction changes. On the other hand, however, he may have deemed this counterimage too punctual, fearing it would steer the complex montage too much in one direction.

In terms of its historiographic scope, this sequence would have stretched the film's field of investigation even further back into antiquity. Similar to the material explored in *Images of the World*, the sculptures embody a tension between persistence and disfigurement. At the same time, the argument about the coevolution (or even interdependence) of a specific regime of vision and modernity is much more pronounced in the finished film.

VI.

Coming back to the question of measuring, I want to speculate about the contributions the archival material makes to this fundamental issue. Although their exact relation to the film remains vague, the two items I have presented and briefly commented upon here are paratexts of *Images of the World*. Seriously considering them as potential parts of this project allows us to better understand the idea that, for Farocki, the problem of measuring is embedded in a longer historical trajectory of labor and automatization. Compared to his initial funding application, the finished film *Images of the World* presents a framework that is both more focused and broader. It is more focused in that it zooms in from the history of labor, as exemplified in the technologies of turning, to a more tightly framed genealogy of the labor of vision. At the same time, it is broader in that it highlights visuality—in both its embodied and machinic form—as the site where fundamental shifts from the human to the machinic and from hermeneutics to datafication play out. As the voiceover commentary of *Images of the World* succinctly characterizes the fundamental change, "then pictures into measurements, today measurements into pictures." The act of decoding and measuring presupposes a world of discrete entities (be it the grain of a photograph, the numbers of a secret code, or the zeros and ones of digital data). This idea is encapsulated in Flusser's concept of the "technical image" and points to a longer history of image technology and mathematics. What is at stake here is a "genealogy of abstraction," which is inherent in both conceptual thinking and the generalizing transition toward numbers and quantities. In Farocki's work, we encounter abstraction as a two-sided, highly ambiguous issue: on the one hand, it epitomizes intellectual

(19)
See Nora M. Alter, "The Political Im/perceptible in the Essay Film: Farocki's *Images of the World and the Inscription of War*," *New German Critique*, no. 68 (Spring / Summer 1996): 165–92.



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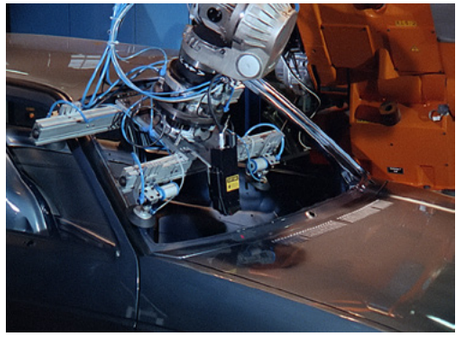

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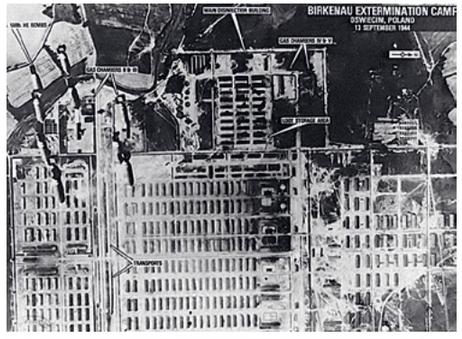

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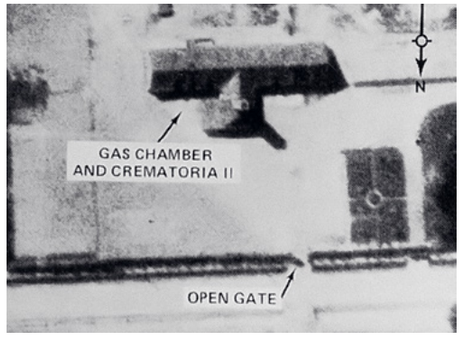

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figs. 9–17 Harun Farocki, *Images of the World and the Inscription of War*, 1988, 16 mm, color and b/w, 75 min.

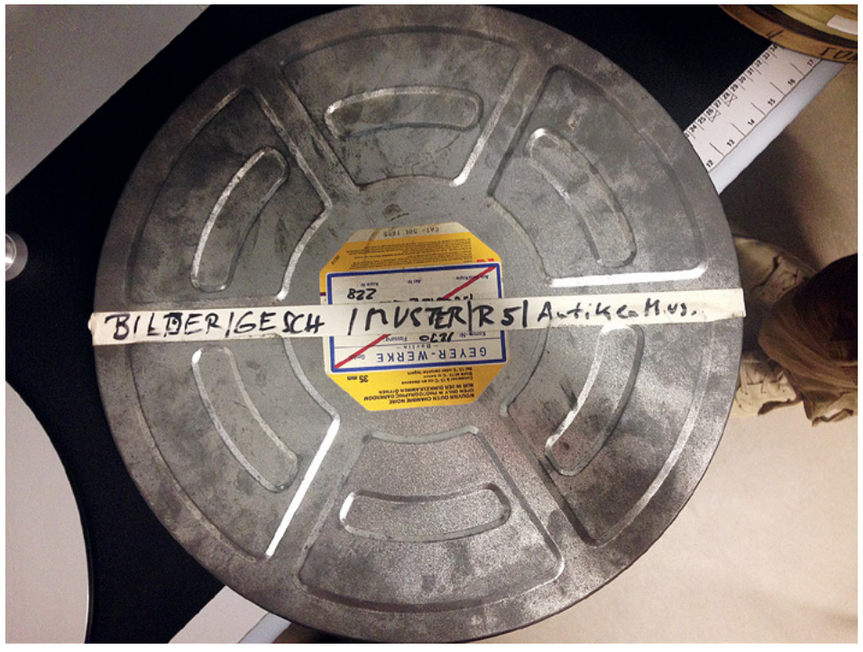

fig. 18 HaFI archive, June 2018. © Volker Pantenburg.

activity; on the other, however, it implies distance and potential alienation (just like Brecht's *Verfremdung* and Marxist *Entfremdung* share certain similarities).

The act of touching embodied by the blind girl, by contrast, emphasizes the concrete and the continuum of sensory experiences that potentially defies calculation. We find ourselves not in the realm of semiotics or cybernetics and their discrete elements but in that of phenomenology and its insistence on the irreducibility of experience.

In this context, it is illuminating to return to Anders. As previously mentioned, Anders had a strong influence on Farocki in developing *Images of the World*. A passage from Anders's speech "Schinkensemmelfrieden," published in the journal *Konkret*, is quoted explicitly in the film's voiceover. (20) Commenting on the US military's plan to deploy atomic weapons on German soil, Anders reminds us of the failure to bomb Auschwitz. "'The Reality must begin.' That means: The blockading of all entrances to the murder installations which permanently persist must be equally persistent. Let us destroy the possibility of access to these weapons. To the atomic rockets." Anders's statement is a vehement demand that a lesson be learned from the historical failure in facing Auschwitz. In quoting this passage, Farocki expresses his agreement with Anders and supports his claim.

At the same time, Anders and Farocki strongly disagree on another topic tied to the question of measuring. In Farocki's film, the US series *Holocaust* is dismissed as a failed attempt to approach the Shoah. Accompanying still images from the TV series, a map depicting the location of the camps, and a chemical formula, the female voiceover (in the English version, spoken by filmmaker Cynthia Beatt) states:

> Inspired by the success of the TV series *Holocaust*—which aims to depict vividly suffering and dying, and thus turns it into kitsch—two members of the CIA fed into the photo archive computer the coordinates of all strategically important targets situated in the vicinity of the concentration camps—and thus also the coordinates of the IG Farben plant at Monowitz. There must be pictures of everything.

In Farocki's argument, the (fictional) depiction of suffering and dying necessarily leads to "kitsch."

After the series was broadcast in Austria in March 1979, Günter Anders thought and wrote extensively about his experience watching it. (21) In his diary entries between March 4 and April 20, he came to an entirely different conclusion than did Farocki. He claimed that the Holocaust offered an important lesson: "The lesson must not be unlearned: *Fact can only be rendered manifest and memorable through fiction; the uncountable, only through individual cases.*" (22) Arguing against the criticism that the plot inadmissibly "personalizes" the horror and thus renders it harmless, Anders claims that "personalization" has been a crucial narrative and dramatic tool since Aeschylus and continues to be one today. Nobody has ever accused these authors of illegitimately personalizing world problems. Depersonalization, on the contrary, was precisely the mass murderers' agenda: "When they compiled the timetables for the human freight; when they called our mothers, fathers, and sisters 'subhumans' and—what became easy after attributing this label—treated them like cattle." (23)

(20) Günther Anders, "Schinkensemmelfrieden: Rede zum Dritten Forum der Krefelder Friedensinitiative," *Konkret*, no. 11 (1983): 52. Anders's text also figures prominently in Farocki's essay "Reality has to begin," first published in the catalog *Fotovision: Projekt Fotografie nach 150 Jahren* (Hannover: Sprengel Museum, 1988), 119–25; and subsequently translated as Harun Farocki, "Reality Would Have to Begin," trans. Thomas Keenan, Thomas Y. Levin, and Marek Wieczorek, *Documents* 1–2 (Fall/Winter 1992): 136–46.

(21) Anders's notes became part of the book *Besuch im Hades*, which was first published in 1979. Günter Anders, *Besuch im Hades: Auschwitz und Breslau 1966. Nach "Holocaust" 1979*, 3rd ed. (Munich: Beck, 1996).

(22) Anders, *Besuch im Hades*, 181 (translation mine, emphasis in the original).

(23) Anders, *Besuch im Hades*, 183 (translation mine).

Further, Anders adds that the more than thirty years since the end of World War Two have not led to any understanding of the enormity of the genocide—the number of "six million" does not help one comprehend what happened: "Since the message was reduced to this enormous number, it has not reached our ears, eyes, or souls in 33 years." Against this backdrop of incomprehension, *Holocaust* successfully counters this abstraction and reduction:

> While the simple narration of facts, or even their statistical enumeration, was by no means able to animate and instruct our imagination, *Holocaust* was. The invented character of a single tortured person, whose (fictional) life we learn about and who enters our hearts, says more about millions than the enumeration of millions could ever say about even one single being. (24)

Farocki's and Anders's contrasting views point, on the one hand, to different ways of relating mathematics, rationality, and quantity, and, on the other hand, to experience, empathy, and singularity. In Farocki's view, it is illegitimate and unethical to resort to personalization, fictionalization, and identification—it can only yield kitsch. The abstraction inherent in the distance and grain of the aerial photographs, for instance, shields the victims from our gaze and thus further exploitation. Anders argues that this policy of abstaining from individual stories has made it easy to displace and suppress compassion and pity for and solidarity with the victims. Only by inventing concrete histories and individualizing the horror can we start to grasp what lies beyond the capacities of rational thought.

My point here is neither to privilege Farocki's call for distance and abstraction nor Anders's conviction that personal stories are needed. As Nora Alter has pointed out, Farocki does not always follow his own advice, for example, when he speculates about the feelings of an Algerian women photographed for the first time by Marc Garanger in 1960, (25) a woman photographed after her arrival in Auschwitz, and a female prisoner who is supposedly smiling: "He seems at risk, in these three voice-overs involving women, of producing precisely such 'kitsch,' of reproducing the problematic in/visibility he exposes in his account of the IG Farben/Auschwitz photographs." (26) I would argue that a dialectical tension between the individual and the incomprehensible number of victims of torture and extermination is crucial and must be acknowledged.

In German, the term *Messbild* (measuring image) encapsulates the ambiguity of Farocki's argument in *Images of the World*. The quantification of data and traditional iconographic qualities are both present in photography and the subsequent media-historical iterations of "technical images." In quantum mechanics, researchers have come to agree that quantum entities may be described as particles or waves, which led Einstein to state: "It seems as though we must use sometimes the one theory and sometimes the other, while at times we may use either." In a similar duality, all of today's images are *Messbilder*—equally composed of abstract data and concrete visual forms.

In its completed form, *Images of the World* probes deep into the world of quantities and abstraction and eventually into the computability of images. A potential counterimage to this is the footage shot in the Collection of Classical Antiquities revealed by the archive,

(24) Anders, *Besuch im Hades*, 187 (translation mine).

(25) See Marc Garanger, *Femmes algériennes 1960* (Paris: Contrejour, 1982).

(26) Alter, "The Political Im/perceptible in the Essay Film," 181.

figs. 19–22 "Images/Histories," ca. 1987, shooting of *Images of the World and the Inscription of War*, 16 mm reversal film, color, magnetic tape, 20 min, 2K digitization, October 2019. © Harun Farocki GbR.


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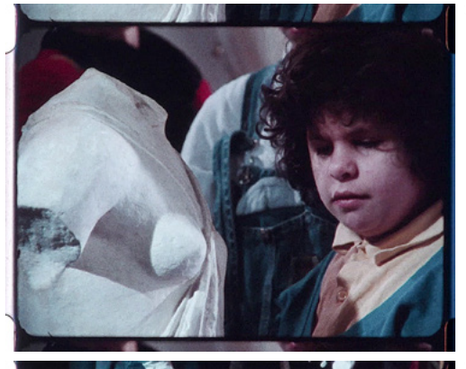
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which points to the limits of quantification and measuring. In a short essay published in *Discourse* along with Kaja Silverman's seminal essay on *Images of the World* (27)—a conversation between Silverman and Farocki on Godard's *Passion* (1982) and the voiceover commentary in *Images of the World* (28)—Farocki reflects on his position as an author. Briefly revisiting the three decades since the invention of the *politique des auteurs* around 1960, he emphasized the rapid process of de-skilling and automatization film production has undergone. The result of the shift toward datafication on the level of the image has its counterpart on the level of production, where more and more elements of the craft have been automated and subjected to "rationalization." He ends by saying: "I have described here, in short, a very powerful development, which excludes me and shuts me out. My only means of defence is to make films on this topic. I make films about the industrialization of thought." (29)

This comprehensive shift affecting the field of labor and intellectual thought becomes most visible (or, rather, increasingly less visible) in the data sets formerly known as images.

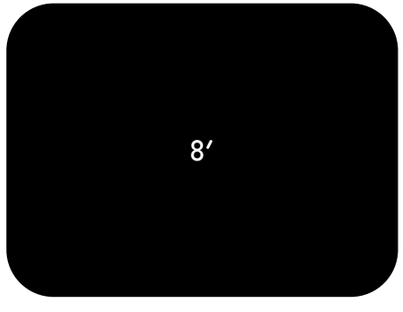
(27)
See Kaja Silverman, "What Is a Camera?, Or: History in the Field of Vision," *Discourse* 15, no. 3 (Spring 1993): 147–58.

(28)
See Harun Farocki and Kaja Silverman, "To Love to Work and to Work to Love: A Conversation about *Passion*," *Discourse* 15, no. 3 (Spring 1993): 57–75.

(29)
Harun Farocki, "The Industrialization of Thought," trans. Peter Wilson, *Discourse* 15, no. 3 (Spring 1993): 76–77, here 77.

Looking at *Krakatau* (1930)

Alexandra Navratil



DOI: 10.53788/TAME0104

When watching early films in the film archive—that is, in placing the reel on the Steenbeck, carefully guiding the filmstrip along the various rollers, and cranking with one hand while gently pressing the film down with the pointer finger of the other hand—the material nature of film becomes tangible and time haptic and plastic. It can be sped up and slowed down until one can look at it frame by frame, until one can detect and ultimately become familiar with the slightest differences in the image itself or the image carrier. The reel, if it has not yet been digitized, is unknown terrain about which often only the title or isolated terms or dates can offer any clues. In my work, I am usually looking for something specific but nothing I can precisely define ahead of time. It begins with an intuition, a vague feeling, and an attraction to specific images. These images often have a potentiality, a formlessness, and an openness; they change aggregate states. They are alchemical images, often transitional images, and are thus usually very brief sequences between two more significant actions.

Consequently, these images are more reserved and enigmatic; they cannot be directly read or categorized. They are hidden in industrial, non-fiction, medical, and scientific films. To track down these cinematic sequences, I must slow down the film to view isolated frames and often watch the same segments several times to understand what has changed in the intervals between the images. After viewing the filmstrip several times, it becomes a familiar and recognizable topography. A nick, a speck, a scratch, a cut marked by a yellowed strip of tape, a blueish discoloration—the subtlest movements, actions, and gestures in the scenes come to the fore. A hand is slowly raised as it slightly turns. A gaze is averted and followed shortly by a cut. A bird lowers its wing until it extends beyond the edge of the frame. Cut. One sees blood cells flowing rapidly in one direction, then, after a cut, a close-up of other cells flowing in the opposite direction. I memorize the precise sequences of the individual images. Gradually, the commonalities between the images I discover in this way, how they are similar and their effect, become clear. In this way, I discover rules for searching for other film sequences. Each film reel promises a new opportunity to find something special.

In 2018, as an artist in residence at the Eye Filmmuseum in Amsterdam, I had the opportunity to conduct research in the archives and was allowed to develop and produce new artistic works using archival material. I came to the archive with very few concrete ideas. My research focused on early non-fiction and industrial films,

and I wanted to approach the films as open-mindedly as possible, waiting to narrow my search until a later point in time. During the weeks I viewed the digitized films on a monitor and the original reels on a Steenbeck, I began taking very detailed notes on the scenes. These text fragments grew into minute descriptions, which, on the one hand, helped me remember the segments I found interesting. On the other hand, writing things down also served as a way of setting aside or shedding the cinematic images. The images of the early non-fiction and industrial films, the colonial and instructive medical films, had, over time, become indelibly imprinted on me, and I could hardly escape their presence. By writing down the events, I was able to rid myself of these cinematic phantoms of modernity; of measurement and destruction; of systematic violence toward humans, animals, and plants; of accumulation and exploitation. I have continued this descriptive practice in my research.

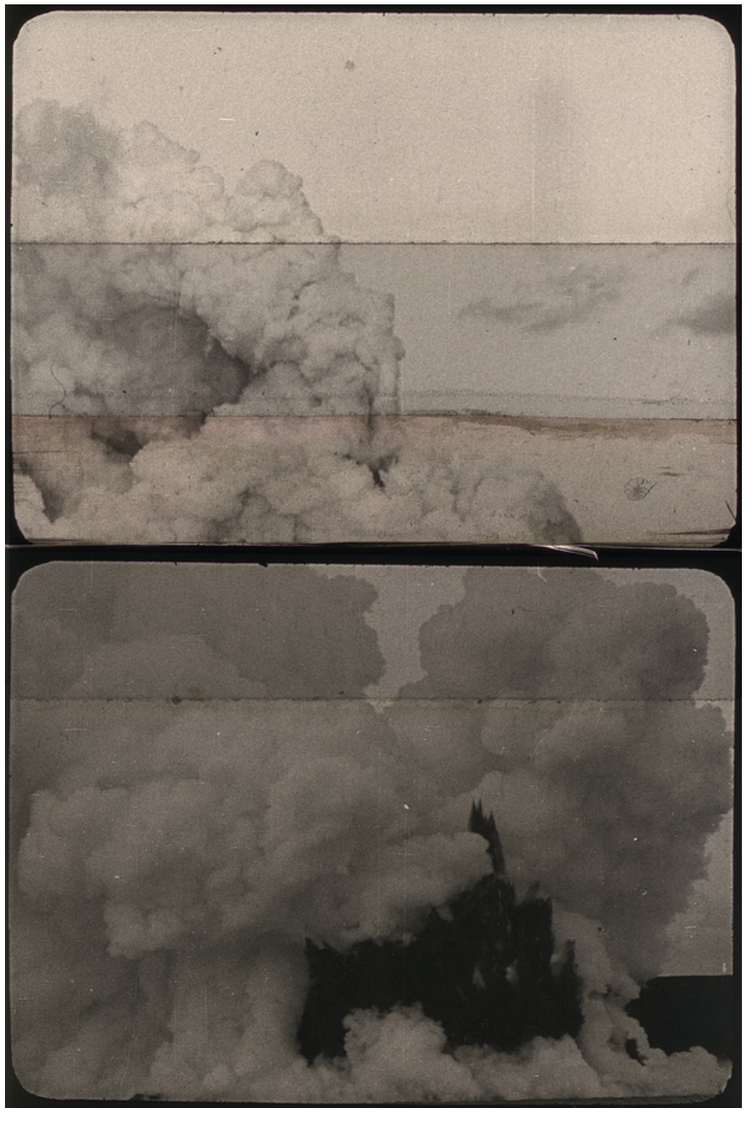
The following passages were composed while viewing the 1930 Dutch expedition film *Krakatau* in slow motion and describe three short sequences. The formlessness of the clouds emitted by the volcanic eruption makes one even more aware of the rectangular format of the image and the presence and movement of the camera. By viewing the film in slow motion, elements captured in the recording and on the image carrier blend together.

1 .

Between fields and zones in varying shades of gray, lines extend through the entire rectangular image space—some curved and vaguely sketched, others clear and orderly. Slightly blurred by a thin veil of clouds, one can see contiguous wild wooded areas and rows of trees running along borders and riverbanks or grouped in plantations forming patches. These images are briefly interrupted by two shots of a propeller plane flying parallel to the camera filming it: in the first shot, the plane is just below the camera, and in the second just above and closer to it. Next, one sees a vast and densely wooded area extending to the coast at which point it frays and disappears in the cliffs and waves. The shoreline quickly drifts away to the left, giving way to a view of the open sea. An elongated white cloud hangs above the surface of the water, devoid of contrast. The camera moves jerkily and unpredictably; shaking, it tries to capture the cloud of ash in its entirety. Twice it casts its gaze back to where the pilots' faces can be seen. At one point, the plane's wing covers the upper right portion of the shot before the camera shifts slightly to the left, revealing an unobstructed view of the eruptions and the stratified bands of rock that slope down toward the sea. The plane flies around the headland of Rakata, which, surrounded by the pale foam from the waves, protrudes, at times almost symmetrically, from above into the frame. As the plane continues its flight, a dark explosion of ash appears, which seems to split into two as it ascends.

2 .

In the narrow strip of the water's surface visible in the lower right corner of the frame, a pointed black cloud appears and rapidly rises. Casting offshoots, it expands, thick and impenetrable like a hedge, as the camera swings downward with the boat on the waves, revealing more of the turbulent sea. The white, fluffy remains of clouds from



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figs . 1–3 Alexandra Navratil, *Krakatau 1930*, 2021, photogravure, 59.7 x 39.5 cm. Photo: Edition VFO.

2

the last eruption move along the horizon while individual darker wisps of clouds remain stuck in the uniform sky. The cloud of ash grows, reaching the upper edge of the frame, and the camera pulls back toward the right before swinging upward with the waves again. The dark, sprawling cloud is fraying but seems to be gaining in density from the inside as its tips fade to gray. The black silhouette of a flat, bare island called the Child of Krakatau emerges from behind the white band of clouds on the horizon, fixing the viewer's gaze, which is otherwise lost in the formlessness of the waves and cloudscape. Again and again, eruptions shoot out of the cloud formation and rise parallel to one another in the upper left corner of the frame to then plummet slowly back toward the water's surface in broad arcs. The cloud, now void of contrast, fills the frame. The horizon is on an angle, and the restless waves seem to flow past the edge of the frame. The camera rises again in an attempt to capture the simultaneously growing and collapsing cloud in its entirety. There is another cut, and a new cloud constellation takes over the entire frame. The camera and boat are now closer to the action. The vertical movements intensify, and the eye unwittingly moves along with them. The frame seems to be divided into two parts: on the left side, light-colored, uniform clouds; on the right, volcanic rocks that are constantly and explosively being thrown upward, puncturing thousands of holes in the image. They rain down into the turbulent water, causing smaller clouds to billow up. Again, the island's massif slides like a dead whale from the left side of the frame into the middle. The camera swings upward, following the rising column of smoke butting against the upper edge of the frame. In the case of the camera, a cut follows, the adhesive tape used visible, and for a moment, all that can be seen is the one-dimensional sky with no point of orientation. Then, from the lower left side of the frame, a dark cone of ash flies upward at an angle, relentlessly renewing itself and exponentially gaining in volume as it moves. The camera plummets, and the restless sea fills two-thirds of the frame. Flat waves approach the boat at equal intervals. The camera has now once again returned to cloud height. Violent eruptions multiply like furious tentacles, grabbing at the edge of the frame as though trying to escape the confines of the rectangle. At the same time, like an undertow, the cloud's interior absorbs parts of itself. With another cut, barely noticeable this time, the camera pauses briefly at the upper end of the towering cloud, only to immediately sink back down, where another cut places it back in the action. Dust and spots on the filmstrip blend into the image shimmering with flying rocks. The boat is at the mercy of the massive explosions and dances along with the waves. Another cut and we find ourselves in a white cloud, brightly illuminated from the right, being fed by the falling rain of ash and continuously expanding in the frame. The eye gets lost in the rising and falling, expanding and dissolving. There is no center of the eruption to be found, the surface of the water appears porous, and the elements blend together: ash becomes water, becomes fire, becomes smoke, becomes film base, becomes cloud. After yet another cut, a dark, fast-moving arrow of ash shoots up from the bottom edge of the frame across the monochrome sky toward the sun, now at its zenith. The ocean's surface is heavily overexposed, like a negative of itself, while the expanding dull black cloud fully absorbs the sunlight. The left half of the frame is now densely filled with ash, while on

the right, chunks of lava relentlessly pelt the waves in a waterfall of matter. The boat gains speed and almost seems to circle the action. Eruption after eruption follows, and the billows of smoke flee hastily in every direction. The eye drifts, perceiving the new cloud formations in less detail and more as a series of movements and intervals within a seemingly uniform process. After the last cut, the bare volcanic island is suddenly on the right side of the frame, as the black explosions of ash take place at regular intervals, like an orchestrated firework display.

3 .

An altitude scale, ranging from zero to 1,500 meters, is drawn on a windowpane in black paint. Increments of one hundred are marked with long lines and increments of fifty with short ones. The window is pushed up slightly so that the lower edge of the wooden window frame is level with the surface of the water on the horizon. A mullion bisects the frame, giving the view symmetry and creating the appearance of a crosshair. Through the open part of the window, one sees the dark silhouettes of tropical plants, which orient the view and strangely distort the scale. In the distance, the eruption clouds pile up on the sea—first 900 meters high, then 1,300 meters. They expand laterally, collapse in on themselves, erupt, and dissolve to the right of the frame with the wind. Through the swelling and incessantly changing clouds, the eye tries in vain to read the dimensions on the window scale, which appears and disappears several times, intensifying the inconceivability of what is being seen every time one gets a clear glimpse of it. The trembling of the stencil-like leaves, the sea flickering in the glaring sunlight, and the pulsing of the ash cloud make it impossible to focus one's gaze. The cloud formations appear almost lethargic; the pieces of material fall like waterfalls filmed in slow motion. A seismogram from January 22 and 23, 1929, is inserted, showing the volcanic activities as irritations or jerks in the nervous horizontal lines of a linearly elapsing period. In further seismograms from August 9, 10, and 11, 1930, the lines shoot up and down vehemently and overlap, forming a dense, indecipherable text.

3

23′

The Body’s Time
Film, Dance, and Ritual
in Maya Deren’s Explorations

Dorota Sajewska

DOI: 10.53788/TAME0105

"TIME TIME TIME—not SPACE
ENERGY—not MATTER"
Maya Deren, 1947 (1)

"How can something be measured that is not perceptible to the senses?" (2) asks Norbert Elias in his famous essay on time. Focusing on analyzing the experience of time as an immutable fact of human nature, Elias shows how this seemingly abstract notion can be at once be "something very tangible." (3) Time can be measured in material manifestations of human experience including perceptions of work duration and the sense of physical fatigue, as well as in visible changes transpiring in external reality including a sunset or a lunar eclipse. More than anything, though, time becomes tangible thanks to the physical existence of instruments designed to measure it, from clocks to calendars. Elias, pointing to the genesis of societal manners in measuring time, treats these as a set of human-created instruments allowing orientation in the world and, above all, regulating "the communal life of human beings." (4) At the same time, he argues that the measurement of time can only be comprehended when we reject dichotomies of nature and culture, of subject and object, of processes taking place in natural or in social worlds, and of knowledge of these realms. After all, "[n]ot people and nature as two separate entities but people in nature, is the basic concept which is needed in order to understand time." (5)

Reflections on time as an experience, always situated in a specific materiality (human or nonhuman), engender a revision of the status of the body and corporeality within this perception and examination. The body is, in fact, the specific transversal matter connecting the particular and communal, the sensual and intellectual, the natural and societal. Within it, the body contains multiple temporalities—though in its materiality it manifests in the here and now, it bears within the past and history nonetheless, as well as the potential for future change. It is morphing matter: transformative and affecting the environment in its processuality while also being affected by it. Finally, the body is producer and carrier of the energy that initiates movement, propels action, precipitates change.

Yet the body's ontological vulnerability is far from an exclusively human trait. Vulnerability is something that characterizes the whole of the animate world, from humans, animals, and plants to that which the anthropocentric vision of reality has deemed inanimate: rock, earth, water, and air. In this essay, I propose examining corporeality as a peculiar form of material existence and as a manifestation of energy, one that embraces a supra-human communality. In the picture put forth here, corporeality, not fixed by the

(1)
"From the Notebook of Maya Deren, 1947," February 22, *October* (Fall 1980): 21–46, here 23.

(2)
Norbert Elias, *Time: An Essay*, trans. Edmund Jephcott (Oxford and Cambridge, MA: Blackwell, 1992), 1.

(3)
Elias, *Time*, 1.

(4)
Elias, *Time*, 3.

(5)
Elias, *Time*, 8.

boundaries of the human body, serves as a starting point for reflections on the subject of time.

As a guide to bodily time, I choose the cinematic and anthropological work of Maya Deren (Eleonora Derenkowska), a Ukrainian-born US film director, writer, and performer with a background in dance and choreography, as well as an accomplished culture researcher focused on Haiti. Her groundbreaking films including *Meshes of the Afternoon* (1944, with Alexander Hammid), *At Land* (1944), *A Study in Choreography for Camera* (1945), *Ritual in Transfigured Time* (1945/46) and *Meditation on Violence* (1948) were foundational to experimental filmmaking owing to a radical subjectivization of the experience of time and space, and for their dynamic means of depicting movement as an immanent quality both of the body and of motion pictures. The body and film, while one is an organic medium and the other inanimate, share a corporeality inherent to both. It is no wonder, therefore, that the object of Deren's obsession became the exploration of time, an attempt to approach its essence but also to overcome its limitations. From a film-studies perspective, her films' characteristic time manipulations served to achieve certain spatial and narrative effects, as well as to create specific psychological and emotional qualities. I argue that the technical possibilities that the film medium provides for manipulating the picture of the body permitted Deren the means for a most complex approach to the phenomenon of time.

Duration, tension, motion, memory, rhythm, pause, timing, vanishing, transition, repetition, anticipation, deceleration, simultaneity (6)—Deren used these terms in her writings to describe her attempts to measure the body through a fluid picture of time. Her black-and-white shorts use no dialog and employ hard cuts, multiple exposures, superimposed and repeating images, techniques of slow- and stop-motion, with Deren creating dispersed, multilayered narratives fusing into poetic-philosophical essays on the time of the body. Her work endeavors to measure it by way of the body as a medium that simultaneously functions in the natural world and in societal reality, a medium that makes it possible to reconcile a highly subjective experience of time with time's passage independent of human beings. Her interest was not the particularity of experience or identity but rather something that Elizabeth Povinelli has called "the entanglement of existence," which makes it possible "to imagine a form of political solidarity grounded in the entangled nature of human and more-than-human existence." (7) The body, in Deren's films, as a manifestation of multidirectional energy and charismatic matter, enters into dynamic and reciprocal relations with the moving image, and with intertwined, convoluted temporality.

In some of the films—*Meshes of the Afternoon*, *At Land*, *Ritual in Transfigured Time*—Deren is featured onscreen, her body serving as the medium for tracking time and as an instrument testing relations between energy and matter. That body, ready-made and ever at her disposal, was something that, when Deren held the camera, could also affect the picture and engage in interaction with the movement of another body being recorded. "As a supporting structure the human body has no peer. With your camera in your hand, you can photograph from any position that you yourself can get into—pressed against the wall or leaning over an object, sitting on the floor for a low angle or standing on a ladder for a high one." (8) With this view of the body as moving matter on both sides of the camera, something of a dual choreography emerged, of the body and of the image, which examines relations between the position of the body and the camera. In this manner, the camera became an agent of action, no longer simply a passive medium for tracing movement. Now, the object of the camera's exploration is the relationality of energy and matter resulting from a mutual intertwining of the two mediums, the body and film. As Ute Holl writes, Deren's "theory of cinema examines just such an unstable equilibrium (9) as a microstructure of a web of relations, not only between subjects, but especially between people and apparatuses." (10)

The body was a deeply significant medium to Deren in her performative sensibilities as well as in her work as a director and camera operator. In her films, she showed the body in various forms of movement: in more symbolic actions including dance (*A Study in Choreography for Camera*) and martial arts (*Meditation on Violence*), as well as in mundane movements from walking and running to climbing (*Meshes of the Afternoon*, *At Land*). In *Meditation on Violence*, Deren explored movements of Wu Tang and Shaolin shadowboxing in relation to Eastern philosophy (fig. 1). As Ute Holl adroitly notes, *Meditation on Violence* "pits camera and body movements against one another and as is therefore a study of the cinema and the philosophy of Wu Tang at the same time, which is derived from the *Book of Changes* and which views life as permanent metamorphosis." (11)

This attempt to shed the rational Western perspective in the perception of reality meant that Deren, rather than narrowing her view of the body to exclusively that of the human, explored and extended corpor(e)ality into the materiality of stones, the rhythm of waves, and the energy of water and wind as elements transforming the experience of time, recalling inanimate objects to life, like the famous rocking stairs in *Meshes of the Afternoon*. With this, she devised a ritualistic form highly characteristic of her film work, which as she emphasized was developed to transcend the anthropocentric image of reality:

> Above all, the ritualistic form treats the human being not as the source of the dramatic action, but as a somewhat depersonalized element in a dramatic whole. The intent of such a depersonalization is not the destruction of the individual; on the contrary, it enlarges him beyond the personal dimension and frees him from the specializations and confines of personality. He becomes part of a dynamic whole which, like all such creative relationships, in turn, endows its parts with a measure of its larger meaning. (12)

Unlike photography, which Deren treated as an ideal medium for the study of space and the inertness of images owing to its inherent "spatial isolation of a moment in a stable frame," she regarded film as a medium conducive to reflection mainly on movement and time: "motion-pictures are, or should be, *an art which makes its statement in terms of time and movement*." (13) Thus she regarded time-based arts including dance to be the fitting analogue to film. (14) To Deren, dance was a kind of cultural performance, one problematizing movement as a bodily faculty that is at once universal and a culturally conditioned faculty: "dancing is not only a way of moving

(6)
Ute Holl writes on relations between these categories from a film-studies perspective. See Ute Holl, *Cinema, Trance and Cybernetics*, trans. Daniel Hendrickson (Amsterdam: Amsterdam University Press, 2017).

(7)
Elizabeth A. Povinelli, *Between Gaia and Ground: Four Axioms of Existence and the Ancestral Catastrophe of Late Liberalism* (Durham, NC and London: Duke University Press, 2021), 15–16.

(8)
Maya Deren, "Adventures in Creative Film-Making," [1960] in *Essential Deren: Collected Writings on Film*, ed. Bruce R. McPherson (Kingston: Documentext, 2005), 163–85, here 172.

(9)
The term "an unstable equilibrium" to denote life is borrowed from Deren's father, the psychiatrist Salomon Derenkowski.

(10)
Holl, *Cinema, Trance and Cybernetics*, 77.

(11)
Holl, *Cinema, Trance and Cybernetics*, 69.

(12)
Maya Deren, "An Anagram of Ideas on Art, Form and Film," [1946] in *Essential Deren*, 35–109, here 58–59.

(13)
Deren, "Adventures in Creative Film-Making," 177.

(14)
Maya Deren, "Creating Movies with a New Dimension: Time," [1946] in *Essential Deren*, 131–38, here 133.

one's limbs—it also brings the dancer into a different relationship with his surroundings (both objects and space as a whole). It is, in short, qualitatively different from normal, naturalistic movement." (15) The exploration of dance as a meta-reflective corporeality was expressed particularly strongly in *A Study in Choreography for Camera* (1945). The film does not simply record dance; due to the medium, its subject emerges as a distinct phenomenon thematizing the moving body in time and space. *A Study* is the product of fervent collaboration between Maya Deren and Talley Beatty, (16) and of a symbiotic interconnection between camera and Beatty as the dancer who "shares with the camera a collaborative responsibility for the movements themselves. This is, in other words, a dance which can exist only on film." (17)

The film opens with a scene of Beatty moving about in nature, his slow though intensive and precise movements and slender, tautly muscled body harmonizing with the copse of delicate birch trees. Here too, the dancer's final movement among the birches fluidly transitions into the following sequence inside an apartment (or perhaps an artist's studio?). The dancer's leg, first raised at a right angle amidst the trees and then gently lowered to the floor, connects the two spaces: open and closed, nature and culture (figs. 2–3). The interplay of the spaces conceptualized as such defines the short film's construct. We then follow the dancer's movements into a museum (the Egyptian Court at the Metropolitan Museum), and from there we move again out into a nature environment. The sequence also thematizes bodily time in a particular way: the dancer, traversing the expansive museum gallery nimbly, suddenly halts and begins to pirouette. In a close-up, the camera shows his head beginning to spin around its axis, set against a four-headed Buddha sculpture in the background. This movement, physically impossible for the body to perform and made possible via film technique, (18) appears to be an effect of magical influence from the inanimate objects backing it. The repetitiveness and cyclicality of the movement calls to mind a ritual trance; in consequence, the dancer's body leaps through the space as if freed of gravity. In the final shot, the dancer, with his back to the viewer, lands in foliage, his pose that of a Buddhist monk.

In *A Study*, by interweaving film technique and movement language, Deren was able to induce a sense of an absolute corporeal presence somehow separate from the dancing individual. Here, as in her later *Meditation on Violence*, we face what the anthropology of theater calls "the dilated body." Eugenio Barba, in studying secrets of the actor's art, defines this as "a body-in-life," which "is more than a body merely alive," and "dilates the actor's presence and spectator's perception." (19) The dilated body transcends the daily activity of the body, generating greater energy, potentiating activeness, and broadening the space surrounding the body. At the same time, this surplus corporeality leads to "a dilation of the *fabula*," (20) shifting attention to the exact energy of the movement, to a kind of elementariness that is preverbal in nature, and precedes intellectual comprehension. The attempt to tap into corporeality's origins and movement's essence became the foundation for Deren's anthropological explorations, beginning in her experimental films and running through the footage she shot in Haiti during her succession of trips there.

(15)
Deren, "Creating Movies with a New Dimension," 132–23.

(16)
Deren first met Beatty during her work with Katherine Dunham (1941–42), which I discuss later in this essay.

(17)
Maya Deren quoted in Holl, *Cinema, Trance and Cybernetics*, 90.

(18)
Ute Holl writes about the technique: "When the dancer spins in front of a four-headed Buddha, Deren accelerates the pirouette by turning the film speed down in the Bolex from its maximum 64 frames per second to 8 frames per second, thus achieving an extreme fast motion—while an assistant closes the aperture so that the lighting conditions remain stable. The manipulation of the camera appears as art and skill, as a quality of the dancer." Holl, *Cinema, Trance and Cybernetics*, 91.

(19)
Eugenio Barba, "The Dilated Body: On the Energies of Acting," *New Theatre Quarterly* 1, no. 4 (November 1985): 369–82, here 369.

(20)
Barba, "The Dilated Body," 378.

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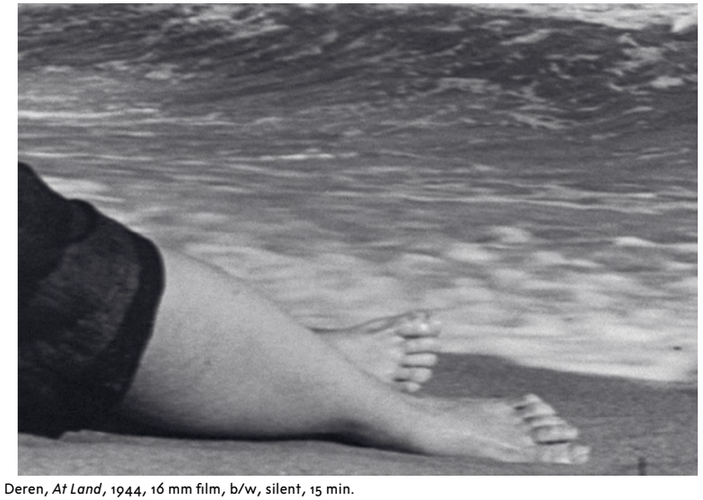
fig. 1 Maya Deren, *Meditation on Violence*, 1949, 16 mm film, b/w, sound, 12 min.
figs. 2–3 Maya Deren, *A Study in Choreography for Camera*, 1945, 16 mm film, b/w, silent, 4 min.

4



5

figs. 4–5 Maya Deren, *At Land*, 1944, 16 mm film, b/w, silent, 15 min.

From the outset, Deren was interested above all in studying the body's encoded repetition as a fundamental measure of time. In *At Land*, a model of repetitiveness is provided by ocean waves evoking nature's immeasurable rhythm connected with the ebb and flow of water. At the same time, the movement of the nonhuman element of water is confronted with human activity. On the shore, we see a woman, initially motionless, who opens her eyes when the camera turns directly to her (figs. 4–5). At that moment, the waves begin to recede. Though this is done with a simple technical trick that involves replaying the previous shot backward, the edit makes it appear as if the woman's gaze is reversing the course of the waves. Ute Holl writes that at that moment the film arrives at a collision of two opposing time flows: "This gives force to two temporal movements of the gaze. One part of the image seems to run backward, an equally strong part of the image, or even stronger through the sensual presence of the beautiful protagonist, seems to run forward in time. This gives rise to a dissociation in the perception of time, a schizoization of time." (21) To Holl, the manipulation of time via film technique is a tool for inducing the psychological effect of depersonalization. In my view, rather than from a film-studies perspective, the scene can be viewed from a more performance-anthropological perspective, which emphasizes less the state of the individuum than relationality as a trait among differing coexisting agents.

Here, the ocean poses no threat and is instead an environment co-functioning and interacting with the human being, one in which there is a correlation of the natural element's time with that of the body. As Deren wrote about the scene: "She is not drowned; rather, the scene implies a birth or passage from one element into another." (22) In the following scene a fluid transition from nonhuman to human matter occurs as well, when the woman rises from the sand, lifts herself onto a nearby tree trunk, and begins to climb it. The integration of body movement with the water's movement, the shifting of the sand, and the trunk's organic presence manifests a specific relationality that generates the movement, of which the dance theorist Erin Manning writes: "Movement is one with the world, not body/world but body worlding." (23) This sums up what we see in *At Land*'s first sequences. In close-up we watch a body moving ably, mainly its hands and feet, deftly grasping the protruding branches.

In this sequence, alternating edits of shots showing something human and something more-than-human, Deren materializes the idea of dance as "an a-personal followingleading" in which succumbing to an impulse does not equate with passive reception, and the initiation of movement is not synonymous with active control. The dance theorist André Lepecki, as cited by Erin Manning, argues that there is a "mode of leading as following, and following by taking initiative," (24) where leading is an opening to another and an invitation to a response, with following being the response to that openness. Deren's "a-personal followingleading" concept fittingly describes the relationship between the body and the image, movement, and matter.

The first sequence's final shot opens at the same time the following sequence. Continuing her animalistic body movement, the protagonist transitions into a dining room full of gentlemen and

(21) Holl, *Cinema, Trance and Cybernetics*, 86.

(22) Deren, "Adventures in Creative Film-Making," 183.

(23) Erin Manning, *Relationscapes: Movement, Art, Philosophy* (Cambridge, MA and London: MIT Press, 2012), 13.

(24) André Lepecki, "From Partaking to Initiating: Leadingfollowing as Dance's (a-personal) Political Singularity," in *Dance, Politics & Co-Immunity*, ed. Gerald Sigmund and Stefan Hölscher (Zurich and Berlin: diaphanes, 2013), 21–38, here 34.

ladies talking around a table. Unnoticed, she crawls across the table in a cloud of cigarette smoke, the sequence intercut with shots of her dragging herself through a thicket of underbrush. Soon we see her once again jumping on the rocks and running across the dunes, expressing her freedom in this dance with nature. That freedom contrasts sharply with her indoors, out of place. The impression is that she is an "other" among people and is herself in nature. Here the words of Elias that open this essay return like an echo: "not people and nature as two separate entities but people in nature, is the basic concept which is needed in order to understand time." (25)

Deren's interest in repetitiveness and reversibility guided her to discover time's ritual quality, an aspect that is especially prominent in *Meshes of the Afternoon* and *Ritual in Transfigured Time*, films in which rituality is achieved through artistic intervention. Along with technical strategies from slow motion to rewinding, different speeds and doubling of sequences, Deren produces a ritual effect by introducing detailed, repetitive activities performed by the protagonists and various objects involved in the action. In the same sense, Roland Barthes called descriptive details of persons and places, remains of real actions in the text, something that produces a reality effect. In *Meshes of the Afternoon*, the ritual effect is performed by objects appearing in a repetitive manner and quickly recognized as symbolic: a threshold, a mirror, a knife, a flower, a key. In *Ritual in Transfigured Time*, the subject is again motion and dance, this time as forms of cultural expression in which social norms, behavior patterns, and the possibilities of their creative reinterpretations are made manifest. Here, Deren reveals that the most mundane social actions, a greeting, or a conversation, possess a ritual dimension in their repetitive ceremoniality, serving to foster interhuman bonds. Through her work on the film, Deren formulated her definition of ritual:

> A ritual is an action distinguished from all others in that it seeks the realization of its purpose through the exercise of form. In this sense ritual is art; and even historically, all art derives from ritual. In ritual, the form is the meaning. More specifically, the quality of movement is not merely a decorative factor; it is the meaning itself of the movement. In this sense, this film is a dance. (26)

In *Ritual in Transfigured Time*, Deren creates an intriguing doppelgänger construction of two women, one played by the brilliant dancer Rita Christiani, (27) the other by Deren. In the opening sequence, Deren holds yarn looped between her hands and makes a motion recalling yarn being wrapped into a ball by another person, initially invisible (nonexistent). This activity, strictly female, one might assert, is relational in nature. As if by magic, the character played by Deren invokes another protagonist (Christiani), who sits across from her and balls the yarn. In this manner, an empty space in the relationship is filled and the specific activity scrutinizes "woman's time." Deren attempted to define this concept:

> What I do in my films, I think is very distinctive. They are the films of a woman and I think their characteristic time quality is the time quality of a woman. The strength of men is their great sense of immediacy and a woman has strength to wait because she has to wait (she has to wait nine months for the concept of a child…). Time is built into her body in the sense of becomingness and she sees everything in terms of it being of the stage of becoming […] in any time form this is a very important sense. I think that in my films, putting as much stress as they do upon the constant metamorphosis, one image is always becoming another. It is important what is happening and not what is at any moment. This is a woman's time sense. (28)

(25) Elias, *Time*, 8.

(26) Maya Deren in a program note on *Ritual in Transfigured Time* (1946), in *Essential Deren*, 252.

(27) Deren first met Christiani, as with Talley Beatty, during her work with Katherine Dunham (1941–42).

Deren's way of thinking about women's distinct experience of time goes hand in hand with Julia Kristeva's proposed conception of women's temporality. In Kristeva's famous essay "Women's Time," she argues that the social and historical exclusion of women cannot be separated from the politically defined patriarchal concept of time that assumes a linear and teleological progression. To pin down the specifics of women's temporal experience, Kristeva proposes reflection on cyclical and monumental time, and thus on the time of repetition and that of eternity, connected with the biological aspects of female bodily existence with menstrual cycles, pregnancy, childbirth, and death:

> As for time, female subjectivity would seem to provide a specific measure that essentially retains repetition and eternity from among the multiple modalities of time known through the history of civilizations. On the one hand, there are cycles, gestation, the eternal recurrence of a biological rhythm which conforms to that of nature and imposes a temporality whose stereotyping may shock, but whose regularity and unison with what is experienced as extrasubjective time, cosmic time, occasion vertiginous visions and unnamable jouissance. (29)

Kristeva thus argues that women's repetitive time is contradictory to the linear time of history, and is a function of universal natural cycles that transcend human objectivity.

This last aspect comes to the fore in *Ritual in Transfigured Time*'s final sequence, which begins with Deren's character walking into the sea, submerging completely, fully consumed by the water (fig. 6). The repetition of this shot creates an impression that the woman is unable to surface, that she is becoming one with the natural elements, her body dissolving in the water. In the scene, Deren creates a peculiar figuration of corporeality, one which Astrida Neimanis calls "watery embodiment," which "presents a challenge to three related humanist understandings of corporeality: discrete individualism, anthropocentrism, and phallogocentrism." (30) The watery body appearing in this experimental sequence is not just a human body, which after all is mostly composed of water, or simply a performer's body submerged in water. On the theoretical level, it is also a kind of "gestational milieu for another—and for others often not at all like us." (31) As Neimanis argues, "posthuman gestationality" rejects binary either/or logic and makes it possible to see that "as bodies of water we are both different and in common. […] Posthuman gestationality is expanded by exploring evolutionary science and related stories of embodied indebtedness, where past and future bodies swim through our own." (32) Water thus negates human politics of location and self-sufficiency, always directing the body to other bodies, manifesting itself as movement in and of itself, movement from body to body.

(28) Her statement is made in Martina Kudlaček's documentary film *In the Mirror of Maya Deren* (2011), 16:30–17:50.

(29) Julia Kristeva, "Women's Time," *Signs* 7, no. 1 (Fall 1981), 13–35, here 16.

(30) Astrida Neimanis, *Bodies of Water: Posthuman Feminist Phenomenology* (New York and London: Bloomsbury, 2017), 3.

(31) Neimanis, *Bodies of Water*, 3.

(32) Neimanis, *Bodies of Water*, 4.

fig. 6 Maya Deren, *Ritual in Transfigured Time*, 1946, 16 mm film, b/w, silent, 15 min.

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What we are dealing with in Deren's films is something I propose to call expanded corpor(e)ality. Deren, in studying bodily time and attempting to access through to "the origin and meaning of dance-motion in a very simple, anthropological way," (33) opens herself to new forms of relationality that surpass the human. Moving beyond human universality as a starting point for reflection, she makes corporeal matter alter its essence from the human or, in the words of anthropologist Marisol de Cadena, shows it as "human, but not only." (34) This sort of exploration surpassing the anthropological view of reality and going beyond categorical thought of the Western episteme led Deren to a fascination with Haitian culture and its immanent spirituality. By the early 1940s, Deren had developed an interest in ties linking dance and anthropology, and she began to work for the African-American dancer and choreographer Katherine Dunham. (35) Dunham's exploration of Caribbean culture and traditions, (36) as well as the integration of Afro-Caribbean dance languages into her choreography, surely played a constructive part in Deren's burgeoning fascinations. Gathered from source material studied by Dunham, (37) Deren's early intuitions and observations on the Haitian vodun ritual and especially religious possession in dance were then explored in her research in Haiti between 1947 and 1955, and in regular contact and consultation with the prominent anthropologists Margaret Mead, Gregory Bateson, and Joseph Campbell.

Looking at it from the perspective of the study of ritual behaviors, the extensive trove of footage Deren filmed in Haiti is continuous with her earlier anthropological inquiry into the essence of movement and bodily time. At the same time, the confrontation with vodun ritual and religion, and well as with social reality in the countryside in Haiti, radically reformatted Deren's approach to motion pictures. Early on, she had a clear concept of film events she witnessed: following in the footsteps of earlier film experiments, she aimed to find an appropriately poetic form to manifest herself in the picture of ritual dance. In her correspondence with Gregory Bateson, Deren later described her planned Haitian film project as a "fugue of culture" (38) intended to integrate voices, gestures, and objects in producing an image of something invisible and unattainable. Vodun, an unofficial religion largely practiced underground, was persecuted by the government and the Catholic clergy, making any opportunity to photograph or film a ceremony that was not done for tourists extremely unlikely owing to the practitioners' wary self-preservation. This drove Deren to integrate with performers and participants, to take part in the rituals, and ultimately to become a vodun practitioner. In her anthropological study *Divine Horsemen: The Living Gods of Haiti* (1953), she describes the act of surrendering to ritual possession as an encounter with a "white darkness" in which a pure form devoid of any meaning appeared, inhabiting absolute time, with everything existing simultaneously. (39)

Deren's experience of Haiti became something of a rite of passage, which she underwent as an artist and individual: "I had begun as an artist, as one who would manipulate the elements of a reality into a work of art in the image of my creative integrity; I end by recording, as humbly and accurately as I can, the logics of a reality which had forced me to recognize its integrity, and to abandon my manipulations." (40) What had required scripting, staging and

(33) Maya Deren, "Letter to Katherine Dunham," February 17, 1941, in *The Legend of Maya Deren: A Documentary Biography and Collected Works*, vol. 1, part 1: *Signatures (1917–42)*, ed. Vévé A. Clark, Millicent Hudson and Catrina Neiman (New York: Anthology Film Archives / Film Culture, 1984), 431.

(34) See Marisol de la Cadena, "Runa: Humans but not only," lecture presented online at the Riga International Biennial of Contemporary Art, August 13, 2020, YouTube, https://www.youtube.com/watch?v=4hzNhIErr5A.

(35) In 1941, Deren became Dunham's secretary and editorial assistant on tour with the performance *Cabin in the Sky*.

(36) In 1935/36, Dunham did her academic research in the Caribbean: in Jamaica, Trinidad, Martinique, and Haiti.

(37) In 1939, Dunham submitted her thesis "Dances of Haiti: Their Social Organization, Classification, Form and Function" at the University of Chicago and received a master's degree in anthropology.

(38) Maya Deren and Gregory Bateson, "An Exchange of Letters between Maya Deren and Gregory Bateson," *October* 14 (Fall 1980): 16–20, here 16.

(39) Maya Deren, *Divine Horsemen: The Living Gods of Haiti* (Kingston: McPherson, 1983), 260–62.

(40) Deren, *Divine Horsemen*, 6.

ultimately editing of an image transporting the viewer into a temporality that is other than linear, to a territory of the subconscious, dreams, projections, visions and infantile-libidinal instincts, had now been reflected in corporeality itself by way of participation in the ceremony.

The moment of possession is a moment of complete liberation from objectivity as the body is seized by invisible forces (spirits and deities). Thus, all that remained was to record the body subjected to ritual temporality, with no need for manipulation. From that point on, the aim was no longer to induce an effect of rituality with the use of the camera but to document the ritual as faithfully as possible as a specific kind of performance of the possessed body. Four years after first visiting Haiti, Deren secured the raw footage from the ceremonies in a fireproof can, some 18,000 feet of film still on reels, and stashed it away in a wardrobe. (41) She left the film incomplete, (42) convinced of the elusiveness and immeasurability of the ritual experience. She demonstrated the impossibility of editing the gathered traces of the ritual into a cohesive film on vodun ceremonies; (43) she had also shown the possibility of communal experience through ritual participation despite social, ethnic, and cultural differences.

Based on bodily experience and participant contact with Haitian culture, Deren's project casts light on the distinction between intentional human actions and an agency that is more than human. The impact of vodun mythology did not produce an effect in the form of an artwork—in fact, as Deren wrote, it ended in artistic failure. Yet it also entirely changed her attitude to life. This change transpired because of her close witnessing of the vodun ritual, proving that agency is not teleological and evades both an individual's planned actions and the influence of social norms. According to vodun spirituality, agency is not limited to humans' actions, and that which is material is only significant in the metaphysical context. In the ritual, the tension between visible and invisible is negotiated by *loa* spirits, known as *les Invisibles*, which appear when an individual or group enters a trance or possession state, and is then rendered visible through the body in motion. It is said that the *loa* ride their horses to enter a person's body and announce their presence through an intense dance. The *loa* are immaterial, invisible and a very real phenomenon: (44) "the actions and utterances of the possessed person are not the expression of the individual but the readily identifiable manifestations of the particular *loa* or archetypal principle." (45)

The essence of the vodun ceremony lies in the archetype or spirit's actions, rendered detectible at the moment of possession, not in its existence. The onset of the trance state is indicated by a characteristic bodily quivering, hysterical motions, exaggerated facial expressions accompanied by rapid breathing and a specific tone of voice. Alfred Métraux, the Swiss-Argentinian anthropologist, (46) writes that though the possessed may appear to have lost control of their motor functions, this stage of crisis manifesting in symptoms of a psychological nature passes relatively quickly. Ceremonial drumming facilitates the onset of a full trance state, which then takes the form of a dance. The ritual dance is a kind of bodily meditation in which physical actions and the state of mind are in constant negotiation. The poses of the "horses," as the *loa* mount them, are the most visually

(41)
Deren, *Divine Horsemen*, 5.

(42)
The film *Divine Horsemen* (1977) was edited posthumously from Deren's footage by her husband, Teiji Ito, and his wife Cherel Winett Ito.

(43)
Nevertheless, Deren's Haitian experience generated a heterogenous body of work: many hours of film footage, a huge collection of sound recordings, a photo series documenting local life, the music LP *Voices of Haiti* (1953), her anthropological study *Divine Horsemen: The Living Gods of Haiti* (1953), a montage of film excerpts for television, and a series of interviews and lectures given upon her return to New York City in 1955.

(44)
Deren states (original italics) that the "Haitians did not so much ascribe divinity to matter as deduce the spirit of matter from its manifestations. Moreover, these principles which have been abstracted from the phenomena in which they are manifest are not less real than the phenomena, but merely nonphysical and invisible; and this fact may illuminate the *Voudoun* concept of *les Invisibles* as real." Deren, *Divine Horsemen*, 88.

(45)
Deren, *Divine Horsemen*, 16.

(46)
Alfred Métraux, *Voodoo in Haiti*, trans. Hugo Charteris (New York: Schocken Books, 1972), 120–21.

spectacular moments of the entire ritual. The entry of a divinity into the human body is not an act of self-expression but a sign of the individual's psyche having been supplanted by that of the *loa*: in vodun terms, the soul—more precisely, the part known as the *gwo bon anj*—has given way to the *loa*. When writing about the particular moment of activating the *loa*, Deren notes: "This, which is a major function of ritual, is something to be experienced only in participation." (47) Here, she indicates both the depersonalization of the individual participating, and that the acting entity has become the community as a whole.

The rhythm imposed by the drums is responsible for participants melding into this uniform whole, and they are physical objects, but also ritual subjects, striving to activate the immaterial *loa*. The drumming joins dozens of individuals governed by a single pulse and moving in a rolling motion communally, as "a single serpentine body." (48) Deren treats the real time of the ritual as collective timelessness experienced through participation: "The entire collective over time [...] here is comprehended, here becomes intimate and feeds and comforts." (49) In the shared rhythm, all become part of the community: not as a blend of individuals but as a collective abandonment of self (the I) in order to serve one another and that which unites them all. The experience of the invisible is the abandonment of real space-time and immersion in the "white darkness" in which contours, shapes, meaning and familiar notions of space-time fall away. From there, one can begin to imagine a different order of memory and history. There, from the bodies of people propelled by a common pulse, emerges the monumental *loa*, and from there "surges this lavish arterial river of ancestral blood which bears all racial history forward into the contemporary moment and funnels its vast accumulations into the denim-dressed serviteur." (50)

The experience of possession Deren describes in *Divine Horsemen*'s final chapter demonstrates togetherness mediated by the body, movement, and rhythm during ceremonial participation as a relationality that transcends the limitations of culture, including normative definitions of social bonds. Noticeable in Deren's ritual act of self-sacrifice is also an attempt to experience the historical time borne in the bodies of excluded Others: the Haitian descendants of African slaves. Vodun is a comprehensive, diversified system combining beliefs, religion, knowledge, philosophy, and art. At its heart lies communication with deities and ancestors by means of the human body. The cruel and violent voyage of the Middle Passage, followed by brutal exploitation in the French colony's lucrative sugarcane fields, played an incontrovertible role in this process of bodily archiving, transmission, and transformation of African heritages among the enslaved.

In *Divine Horsemen*, Deren makes apparent the two sides of vodun ritual, which preserve the tradition of worshipping both the gentle *rada* and the malevolent *petro* (*petwo*). Rada traces back to Allada, the holy city in Dahomey (now Benin), with ties to the Yoruba people. The cult of petro is more local in character, capacitating the surviving natives' vicarious revenge on colonists in Haiti through slaves' revolutionary actions. Deren states: "Petro was born out of this rage. [...] It is the crack of the slave-whip sounding constantly, a never-to-be-forgotten ghost, in the Petro rites. It is the

(47)
Deren, *Divine Horsemen*, 229.

(48)
Deren, *Divine Horsemen*, 257.

(49)
Deren, *Divine Horsemen*, 247.

(50)
Deren, *Divine Horsemen*, 247.

raging revolt of the slaves against the Napoleonic forces. And it is the delirium of their triumph." (51) Deren refers here to the fact that the extremely lucrative colony of Saint-Domingue, in becoming Haiti, went through an exceptionally brutal power struggle between its majority population, comprising the enslaved, colonists and free people of color, and the governments and expeditionary forces of France, Great Britain, and Spain. The Haitian Revolution established the first nation founded by former slaves. Yet the cost of that transformation cannot be overstated and its impacts, including harsh long-standing international sanctions, have continued to afflict Haiti and Haitians to this day.

Emerging from Deren's experience of ritually transcending boundaries of a personal body is the colonial and racial history that is an indelible component of "liberal Western ontologies and epistemologies and the concept of the West." (52) In that manner of understanding time, with its pursuit of measuring or rather proscribing, the ethereal, bodily experience becomes subordinated to rational cognition. Thus, the manifold temporality and interconnectedness of the human and more-than-human disappears in the Western episteme, based as the latter is on the hegemony of the white man as the sovereign agent and on the concept of progress, which in turn had assumed the existence of linear time. "Progress is a forward march, drawing other kinds of time into its rhythms. Without that driving beat, we might notice other temporal patterns," (53) posits Anna L. Tsing, pointing at the same time to the need to recognize non-Western temporal patterns, as they make it possible to imagine supra-human forms of communality. The presence of traces of "the ancestral catastrophe" (54) in Maya Deren's Haitian explorations makes it possible to experience in her ostensibly apolitical work a kind of temporal polyphony interweaving the past and the present, nature and culture, the tenacious durability of cultural efforts, experiments, and traditions, the history of colonialism and that of capitalism, the crisis of social bonds, and the very idea of humanity.

(51)
Deren, *Divine Horsemen*, 62.

(52)
Povinelli, *Between Gaia and Ground*, 15.

(53)
Anna Lowenhaupt Tsing, *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins* (Princeton, NJ and Oxford: Princeton University Press, 2015), 21.

(54)
This is a concept borrowed from Elizabeth A. Povinelli, who recognizes contemporary social and environmental crises as "arriving out of the ground of colonialism and racism rather than emerging over the horizon of liberal progress." Povinelli writes about 4 axioms of existence that are addressed to the ancestral catastrophe: "the entanglement of existence, the unequal distribution of power to affect local and transversal terrains of this entanglement, the multiplicity of event and collapse of the political event, and the provincial and dangerous nature of Western ontologies and epistemologies." Povinelli, *Between Gaia and Ground*, 3, 54.

2′

The Analog Filmstrip
A Manifesto

Philipp Fleischmann

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35 mm wide. Perforation holes along both edges at three-millimeter intervals to facilitate mechanical transport. Material base on one side, light sensitive emulsion on the other. Film and photography share one and the same raw material. In fact, in the case of the 35 mm filmstrip it is the exact same: If we work with the strip vertically, we produce a motion-picture film, while if we work with the strip horizontally, we produce a photographic image. Focusing on the format of the 35 mm filmstrip not only shows the essentially kindred nature of analog photography and film, it also reveals how one and the same strip of film can be variously considered and utilized.

Industrially produced film cameras bear a variety of premanufactured characteristics, which determine how surrounding reality is supposed to be filmically represented. A central aspect is constituted by the division of the filmstrip into 24 frames per second, enabling a presumably neutral and continuous representation of reality upon projection. But what if this intrinsically problematic process does not meet with one's own desire—if it is not of interest to work with the concept of reproduction, but instead intriguing to probe and explore other visual connections and manifestations?

In my opinion it is in this regard that the filmstrip offers a vital opportunity. Before it is exposed to light, analog film is not divided into individual frames. Film is by nature blank. It is an empty strip that can be inscribed by various recording concepts. It is constituted by a physical materiality upon recording that can itself enter actual physical space. It becomes a unit of measurement and interaction.

To this end, I create spatial camera forms that rely upon the principle of the camera obscura and that can assume a different shape for each individual project. Thanks to the film strip, these camera sculptures provide a starting point for the cinematic gaze. A gaze detached from the human eye. A gaze that primarily thinks in terms of spatial relations and not according to compositional qualities circumscribed by a rectangular film gate.

It has become necessary for me to decouple the filmstrip from the traditional camera. In my view, there is a space between the polar opposites conveyed by a relatively exact mechanical reproduction of reality (camera) versus complete visual abstraction (cameraless). A space in which the politics of descriptive representation appear negotiable. Only the medium of analog film opens up this space: a space of negotiation.

2

fig. 1 Philipp Fleischmann, *Film Sculpture (1)*, 2022, 16 mm film, color, silent, aluminum, polyoxymethylene, 100 × 20 × 405 cm. Photo: Peter Mochi.

fig. 2 Philipp Fleischmann, *Untitled (34bsp)*, 2021, 35 mm film, color, silent, 5 min 33 sec.

3

fig. 3 Philipp Fleischmann, *Untitled (34bsp)*, 2021, documentation of shooting the film for the Bienal de São Paulo. Photo: Giavana Querido.

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fig. 4 Philipp Fleischmann, *Untitled (Generali Foundation Vienna)*, 2015, camera object. Photo: Susanne Miggitsch.

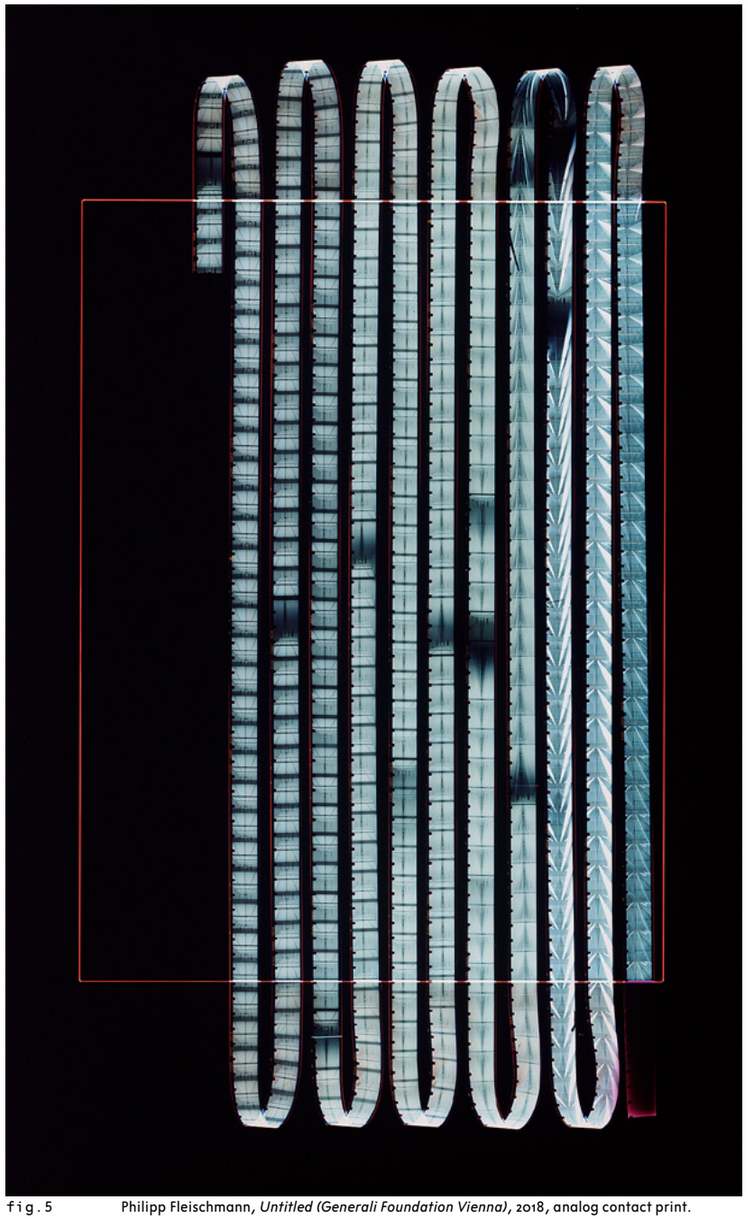


fig. 5 Philipp Fleischmann, *Untitled (Generali Foundation Vienna)*, 2018, analog contact print.

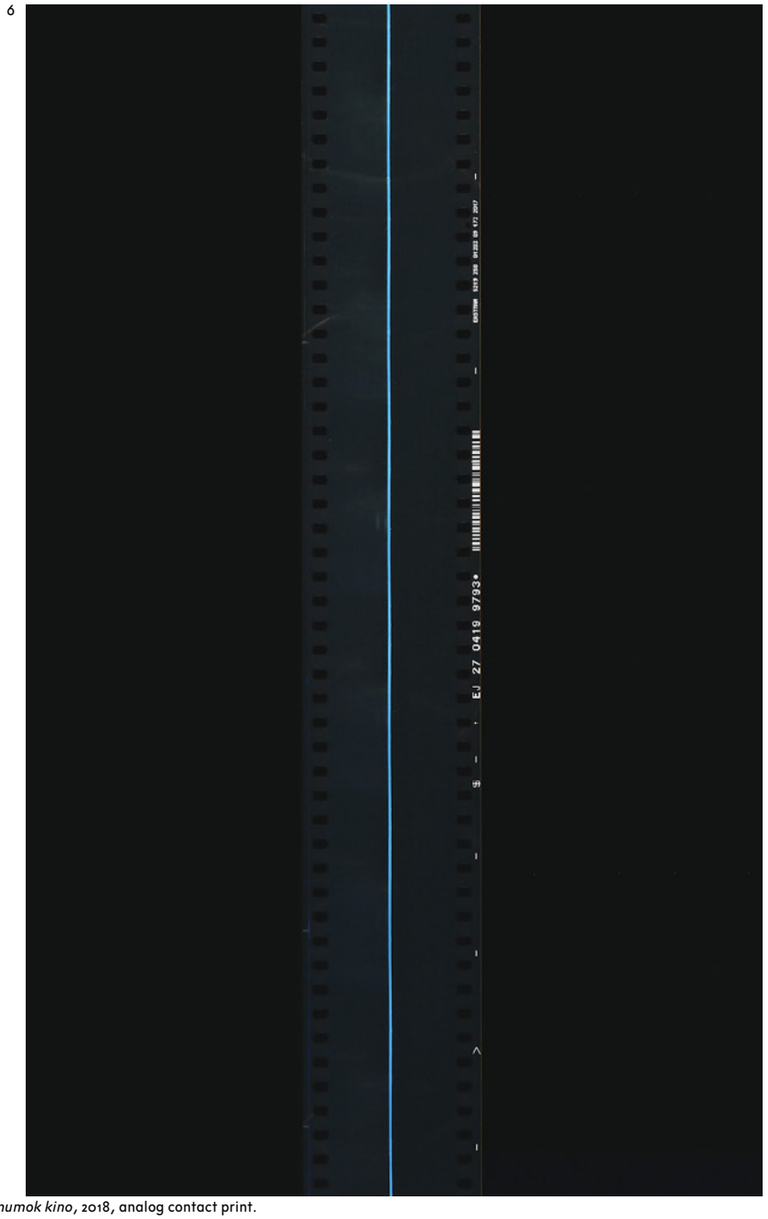
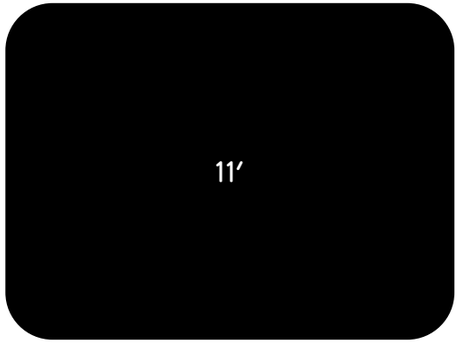


fig. 6 Philipp Fleischmann, *mumok kino*, 2018, analog contact print.



Everything Can Be a Film

Marijke van Warmerdam

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I have been invited to review *Koor (Choir)* (figs. 1–2), a work of mine from 1997 comprised of two 16 mm films with sound. It was purchased for the collection of the Migros Museum in Zurich the same year. With the aim of considering different formats in film and video art, I accepted the challenge of reviewing this work. By extension, I also revisited the work's context: the time when it was made and other works of mine from the same period. To start off, I looked back on what came before.

How I started to use film

I started out as a sculptor; I didn't know anything about film. I didn't even go to movie theaters very often. In 1992, I entered the Prix de Rome, a competition for young artists, wanting to do something I had never done before. What I did know was that I wanted my work to move. Unsure whether to go for film or video, I based my decision on practical factors.

There's a story to be told about how I got to that point. In the early 1990s, a projected film looked very different from a projected video. The low resolution of video meant that you could see horizontal lines all over the screen, whereas film looked physical and realistic to me. Then and now, I compare it to the difference between solid oak and plywood, a wood veneer.

The video projectors at that time were enormous monsters. I was fortunate to come across a picture of one, a picture taken of the Eidophor video projector (fig. 3), which was first installed in a cinema for a demo at the Kino REX in Zurich in 1958. That was before my time as an artist, but I just liked this funny picture. It is not the projector I was looking for in the early 1990s.

I thought I wanted a projector with three big lamps: red, green, and blue. This was supposed to project one image by mixing the three basic colors (fig. 4). But what I discovered was that this kind of projector could not do what I wanted, which was to project a stable image from a turntable in the center of the room. The colors separated as the projector on the turntable rotated. A drawing shows that the distance from the lens to the wall is greater in the corners than in the middle of the wall (fig. 5). It was the different distances between the lens and the wall in a square room that caused the colors to split. This meant using video at that time was not an option.

A film projector, on the other hand, did not have that strange effect of separating colors (fig. 6). It transports the film strip in

such a way that each frame is stopped for a fraction of a second in front of a light source. This bright light casts the image on the film strip through a lens onto the screen. There was only one lamp in film projectors, instead of three, and that lamp gave a clear image. I chose film since it gave me the results I was looking for.

Film, in fact, is simple, and that attracted me. Also, to be honest, I didn't really understand how video worked. In contrast, I could understand each step in the process of making and showing a film. A world opened up to me.

I was lucky to meet Dutchman Ruud Molleman back then. He had his own company specializing in film. At the time, I thought of him as the ultimate film freak in the field of 16 mm film. I didn't know anyone like him, and his love of film was contagious. He was looking for all kinds of improvised solutions for every aspect of film projection. We used projectors in a non-standard way, and since I made film loops, we developed different loop systems. For me, the important thing was that the film never ended. The projectors had to run for many hours a day, which was a heavy burden. The films themselves also suffered from that. The wear and tear was clearly visible in the projection. Sometimes the films even broke. Spare copies were always needed, no matter how sturdy the equipment.

The first time I made a film loop

Passage (1992) was the very first film loop I made (fig. 7). It's a sculpture with a small movie in it, a stop-motion film made completely in a film laboratory. What you see is a black surface on which a white rectangle appears that gets bigger and bigger until it fills the entire black surface. Then, on the white surface, a black surface grows until it fills the whole white surface, and so on. Many of my works are more concrete, based on photographic images, whereas this one is more abstract.

Passage is an all-in-one film installation in which the film is projected onto a piece of paper, the projection screen, via a mirror. It was one of Molleman's inventions to set-up the lens and the mirror behind the paper screen. The work is placed on a shelf attached to the wall. The idea of repeating images in motion was a wonderful discovery for me since it reminded me of walking around and around a sculpture. The act of looking is an endless cycle.

When *Passage* was made, it was a period when I was looking for movement in my work. While preparing for the Prix de Rome competition, I looked for a way to project either a film or a video using a projector on a turntable in the center of a square space. It became the work *Kring* (*Circle*) (1992) (fig. 8).

Earlier, while on holiday in Morocco, I had seen circles formed by people on the famous Jemaa el-Fna square and marketplace in Marrakesh. For over 1,000 years, Jemaa el-Fna has served as a gathering place and market at the heart of the city. Besides market vendors, you can find fortune tellers, snake charmers, poets, and storytellers, who come to entertain the crowds that encircle the attractions, as you can see in old pictures. These historical pictures show human circles (figs. 9–10), which you can still find on the square today. UNESCO has since paved the square with tiles (fig. 11).

The circles stayed in my mind, and in 1992 I took a small crew to Morocco to make a film about "seeing and being seen." We had

to get permission through the Dutch Embassy in Rabat and found a local to help interpret between Arabic and French. A camera was set up on a tripod, which allowed the camera to rotate 360 degrees on Jemaa el-Fna square. Within a few minutes, a large group of people had gathered around it. As the camera started rolling, I stood next to the camerawoman, who slowly turned in a full circle, filming the group of onlookers from its center. I monitored the rhythm of the filming. We aimed for a predetermined steady pace—three rounds per minute, if I remember correctly—as we planned to adjust the projector to the exact same speed afterward in the gallery.

In the exhibition room, the projector is placed on a turntable rotating at the same speed as the recording of the movie itself. The crowd is shown bit by bit by the moving projector, just as we filmed it. This means that whoever is standing in a certain spot will always appear in that same spot. Viewers of the work also keep moving to see the film and avoid blocking the image. *Circle* is a kinetic sculpture screening a film.

Rijst (Rice) (1995) was made a bit later than *Passage*, but the installation with a mirror and paper screen was similar, except for the aluminum frame with guide rollers to support the actual film (fig. 12). During a taxi ride in Indonesia, I suddenly shouted: "Whoa! Please stop! I think I saw something special!" I had seen a young woman on the side of the road. She held a woven basket, and by shaking rice in this basket, she was separating the rice from the husks in a steady rhythm. Her motions were repeating like a loop. I asked her if I could film her and did so with a simple 16 mm wind-up camera. There is no sound on the film itself, but in this all-in-one installation, sound plays a major role: the sound of the projector. The film freezes as the woman smiles graciously, and this freeze accentuates the sound of the projector. *Rice* is a sculpture with a little movie that freezes once in a while.

Tommy, the Bear

Then there's *Beer* (*Bear*) (1997), a work from the same year as *Choir*. *Bear* consists of two films screened next to each other: a bear viewed from the front and the same bear viewed from the side (fig. 13). I had to shoot the film twice since Tommy, the bear, didn't like the studio in Amsterdam for some reason—whether it was the smell or the temperature, something was wrong. At one point, Tommy's handler said it was time to leave since he did not want to lose control of the bear. For the second shoot, we built the set at Tommy's home, and all went well.

Choir

For my exhibition "Mitenand" at the Migros Museum, I had the opportunity to make a new work. The result was *Choir*, a film of a choir performing a piece of contemporary music shot from behind. This was neither the first nor the last time I filmed people from behind, making them appear less personal and more anonymous. To show this film on its own felt incomplete, so I juxtaposed the faceless choir with a film of a boy yodeling full-face. I combined contemporary classical music with the Swiss tradition of yodeling—an anonymous group of people versus a young person expressing himself straight into the lens (figs. 14–15). The title refers to not only the choir itself but the

two films together. In general, I like to respond to my surroundings, for instance, to a place I have been invited to; you can often see this reflected in my work. Persons, specific venues, high culture, folklore, and local traditions and customs capture my attention. When you respond to a place, you step out of your own space. You move, as you can see in the following snapshots (figs. 16–19).

Choir was installed at the Migros Museum with the equipment placed in the middle of the exhibition space. I showed the two 16 mm films, both with sound, not side by side but on opposite sides of the room from each other, alternating the singing and a yodel in reply. It's my take on "call and response."

Equipment for Choir

The installation included two projectors, one perfotape player for sound, three loop systems, an amplifier, and speakers. Photographs show the film in the loop system and the perfotape machine (figs. 20–24). All the machines were connected with each other for synchronization. Standing in the back is Ronald Rosbeek, the man who built the installation (fig. 25). He is a specialist in 35mm equipment and a very sophisticated one at that. Because of the equipment with the multiple projectors for image and sound, it is not a conventional loop. A carefully attuned loop structure is the result. I am fortunate to have been introduced to both free improvisation and intricate technology in my career. In this case, Rosbeek brought the two together. It was great to see how he could improvise with technology.

At that time, Rein Wolfs was the director of the Migros Museum and the "head of technical services" during my show (fig. 26). I have to admit that when exhibited, *Choir* became a work in progress: First, the rattling of the projectors and the perfotape machine interfered with the sound of the voices. A plexiglass cabinet was made to cover the machines and muffle their sound. But this caused a new problem: the heat from the machines had no way to escape. The crew at the Migros Museum came up with the most wonderful solutions; time and again, I have to say, I asked a lot, if not too much, of the technology.

What if there were to be a new version of *Choir*? How could we avoid all these problems? The work is now twenty-five years old. Luckily for me, there is a fantastic new digital solution. In the case of *Choir*, I am completely in favor of that! Using technological innovations wouldn't be right for all of my film works. But it would be great to have a digital version of *Choir*. I am happy to say it is in the making!

Low Tech

Choir was a complicated installation, but not everything I did in that period involved a lot of technology. Thank God I did not only work with film. In reviewing a few other works from that time, it's apparent that, while the material may have differed, the approach did not that much. But when it comes to the technology involved, each piece can present its own problems, or challenges, to take a more positive perspective.

Heen en weer (Back and forth) (1997), a work made of screen prints on paper, was shown for the first time at the Migros Museum (figs. 27–28). On the walls, visitors saw arrows and stripes that directed them where to go. The arrows pointing in two directions functioned as a bridge between the front of the museum and the rear, where *Choir* was shown. I believe that anyone who knows the space would agree that it has since changed beyond recognition.

Good days, bad days (1996) (fig. 29): For this silkscreen-on-paper work, also installed in the Migros Museum, I randomly picked fifty different colors from everyday products. These were used as the background colors of the prints. While you can see the duality and contrast in the text, the colors soften this contrast. The text is fixed, while the background colors change.

Very good, very bad (1997) (fig. 30): I took the idea of duality a step further with the stickers *Very good, very bad*. For the catalog *Einzeln, doppelt, quer (Single, double, crosswise)*, accompanying the Migros Museum show "Mitenand," I made stickers readers could stick anywhere in the catalog.

Don't walk, walk (1997) (fig. 31): In New York City, I stood waiting at a pedestrian crossing on Fifth Avenue and saw that both signs in the crossing light were lit simultaneously. This led to a comical confusion I immediately wanted to film. The New York City Police Department provided me with a pedestrian crossing light that could be switched on and off manually. The resulting film was rather dull, so it eventually became a large photograph.

Chasing colours (1996) was also made in New York (fig. 32). Rush hour traffic on the highways around New York is frantic. I noticed how the colored back doors of trucks alternated as they passed each other. The back doors of the trucks reminded me of Color Field painting that emerged in New York City in the 1950s and 60s. Color Field painting is characterized by large fields of solid colors spread across the canvas. I see *Chasing colours* as a "moving Color Field painting."

What am I actually doing?

Many of my works deal with motion; they simply don't stand still. Nevertheless, in essence, this comes from the way I look at the world. I look at multiple sides of one thing at the same time: a holistic position that allows me to simultaneously see things from different perspectives. This results in various kinds of movement or implied movement: trucks chasing each other, a choir and a yodeling boy combined, catalog stickers, printed arrows and stripes, a pedestrian crossing light with both signs lit. Everything can be a film to me.

At my retrospective exhibition in the Museum Boijmans Van Beuningen in Rotterdam in 2011, I could never have shown so many projections simultaneously without today's digital technology (fig. 33). Technically, it would have been a horrendous job. I have always said that it is about the image, not the technology. And of course, the rattling sound from a projector was usually nice to hear, but not always, as I mentioned before.

Bear was recently shown in a 10,000 square meter hall in the Rotterdam Ahoy at a drive-through exhibition with works from the collection of the Museum Boijmans Van Beuningen (fig. 34). These could then be viewed from behind the windshield of a car. Because of the scale of the hall, I chose to enlarge the work to eight by six meters. The result was a LED wall, 1which looked very good to me. This would never have been possible with the original 16 mm film. I am happy that I have kept up with digital developments. It has opened

new possibilities for me. Everything can be a film to me, and now I shoot them digitally.

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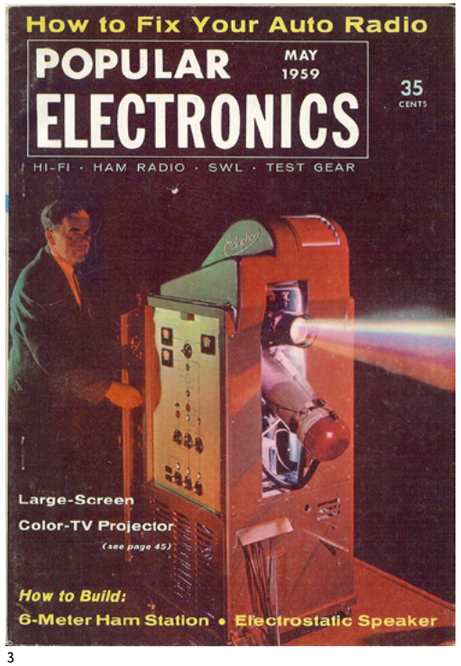
figs. 1–2 Marijke van Warmerdam, *Koor (Choir)*, 1997, 2 x 16 mm film loop, color, sound, 6 min 39 sec, 2 projectors, 2 loop systems, Perfotape machine, amplifier, speakers, approx. 77 × 104 cm / 400 × 575 cm, edition of 3 + 1 AP, commissioned by and first shown at "Mitenand," Migros Museum für Gegenwartskunst, Zurich, 1997. Photo: Nils Klinger for Migros Museum für Gegenwartskunst, 1997.



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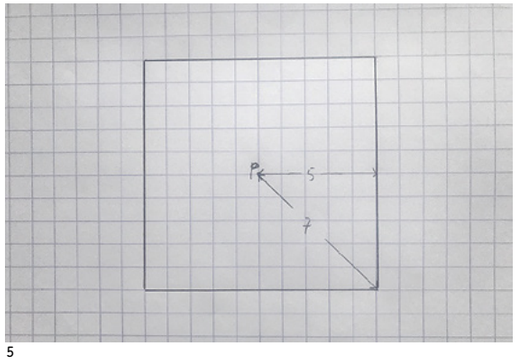

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fig. 3 Eidophor projector on the cover of the magazine *Popular Electronics*, May 1959.
fig. 4 Sony CRT projector. Photo: K-BID auctions, 2015.

fig. 5 Drawing for *Kring (Circle)*. Photo: Marijke van Warmerdam, 2020.
fig. 6 Eiki 16 mm film projector. Photo: Marijke van Warmerdam, 1995.

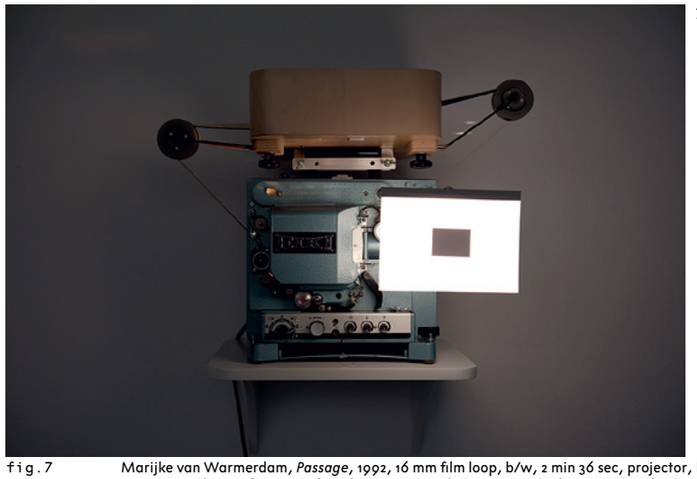

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fig. 7 Marijke van Warmerdam, *Passage*, 1992, 16 mm film loop, b/w, 2 min 36 sec, projector, loop system, shelf, paper screen, projection size 15 x 21 cm, edition of 5 + 1 AP, first shown at "Prix de Rome 1992 Sculpture/Art in the Open," Museum Fodor, Amsterdam, 2012. Photo: Lotte Stekelenburg for Boijmans Van Beuningen, 2011.

fig. 8 Marijke van Warmerdam, *Kring (Circle)*, 1992, 16 mm film loop, color, 2 min 14 sec, projector, loop system, rotation plateau, pedestal, projection height approx. 240 cm, edition of 5 + 1 AP, first shown at "Prix de Rome 1992 Sculpture/Art in the Open," Museum Fodor, Amsterdam, 2012. Photo: Roderik Henderson for Museum Fodor, 1992.

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fig. 9 Jemaa el-Fna square and marketplace in Marrakesh, Morocco, ca. 1920. Photo: Félix.
fig. 10 Jemaa el-Fna square and marketplace in Marrakesh, Morocco, ca. 1940. Photo: Gabriel Gillet.
fig. 11 Jemaa el-Fna square and marketplace in Marrakesh, Morocco. Photo: Marijke van Warmerdam, 2016.

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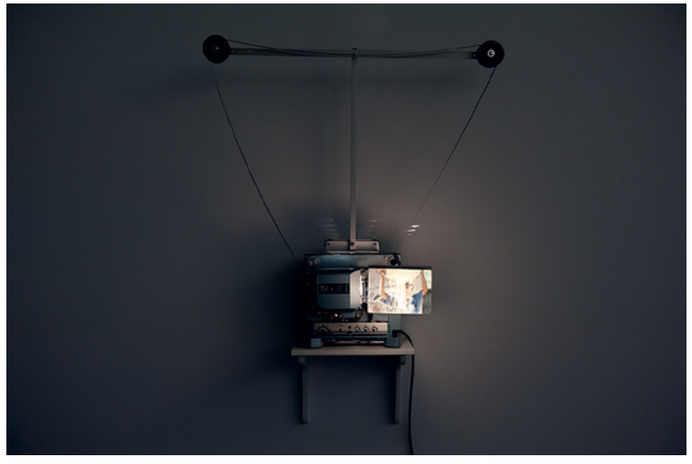
fig. 12 Marijke van Warmerdam, *Rijst (Rice)*, 1995, 16 mm film loop, color, 18 sec, projector, loop system, paper, aluminum, mirror, shelf, projection size 15.4 × 21 cm, edition of 5 + 1 AP, first shown at "La fille aux crêpes," Galerie van Gelder, Amsterdam, 1995. Photo: Lotte Stekelenburg for Boijmans Van Beuningen, 2011.

fig. 13 Marijke van Warmerdam, *Beer (Bear)*, 1997, 2 x 16 mm film loop, color, 6 min 6 sec / 3 min 53 sec, 2 projectors, 2 loop systems, 2 projection tables, approx. 210 × 280 cm each, edition of 3 + 1 AP, added: ProRes 422 HQ, aspect ratio 4:3, first shown at "Single, double, crosswise," Stedelijk Van Abbemuseum, Eindhoven, 1997. Photo: Lotte Stekelenburg for Boijmans Van Beuningen, 2011.



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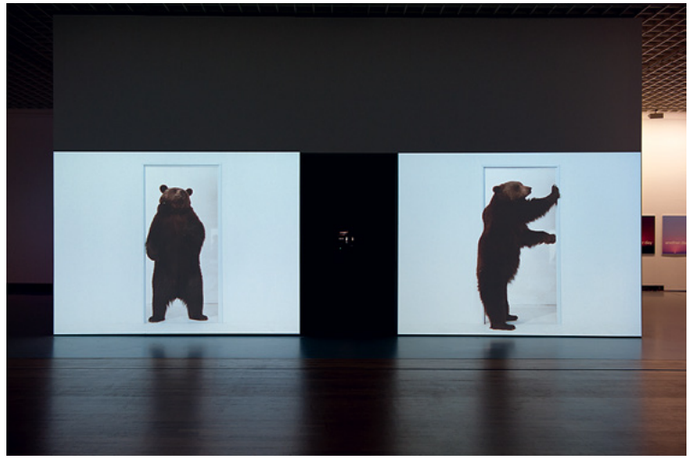

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figs. 14–15 Marijke van Warmerdam, *Koor (Choir)*, 1997, film stills.
figs. 16–19 Pictures taken during the shoot of *Koor (Choir)*. Photo: Galerie van Gelder, 1997.

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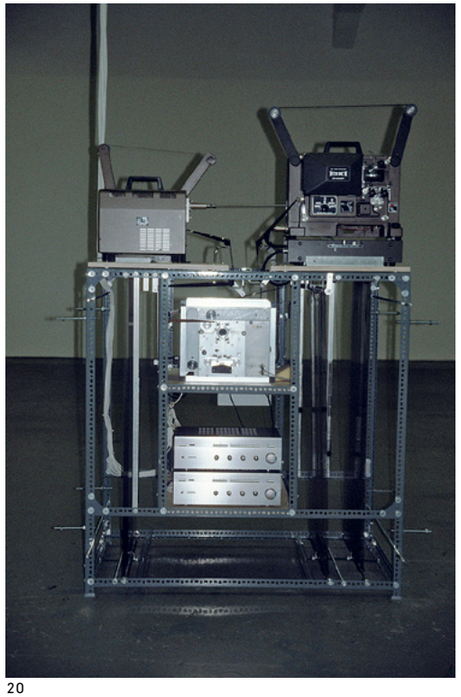

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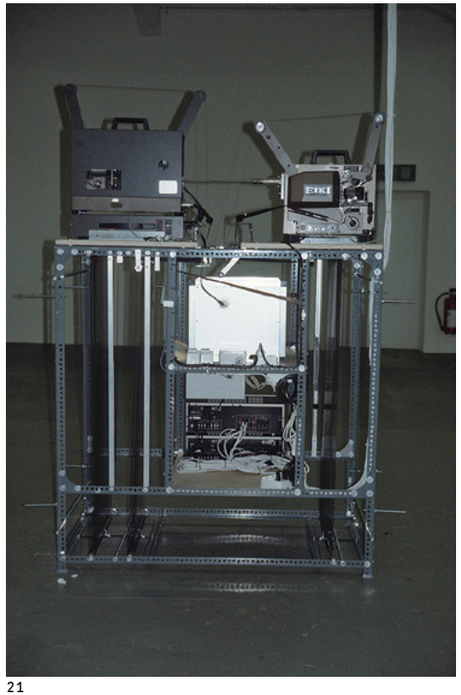

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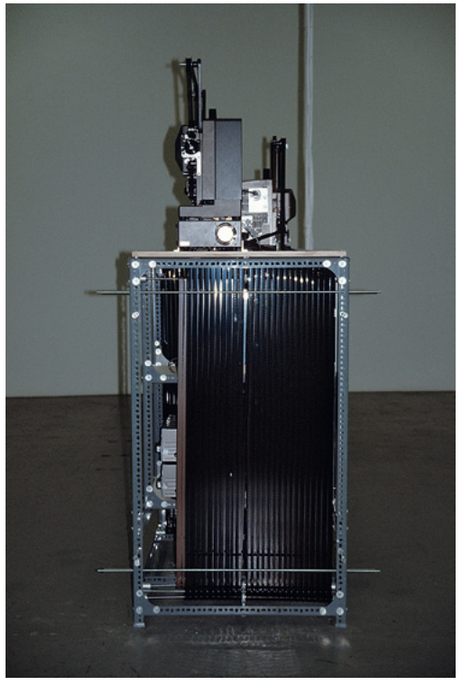

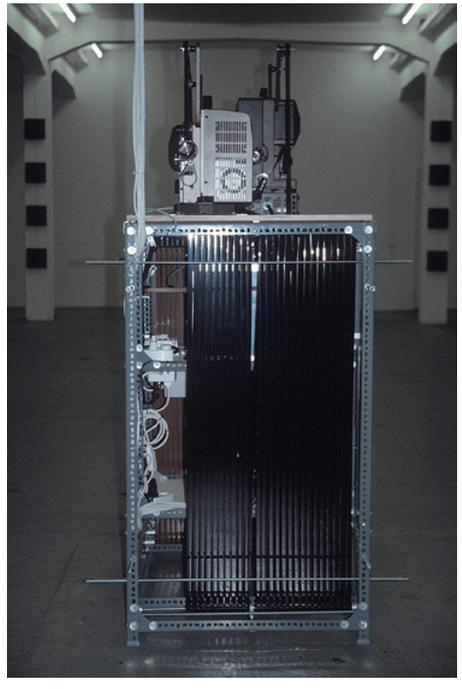

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figs. 20–24 The installation of *Koor (Choir)*. Photo: Nils Klinger for Migros Museum für Gegenwartskunst, 1997.

fig. 25 Ronald Rosbeek at work in his workshop. Photo: Marijke van Warmerdam, 1997.
fig. 26 Rein Wolfs busy with the installation of *Koor (Choir)*. Photo: Nils Klinger for Migros Museum für Gegenwartskunst, 1997.

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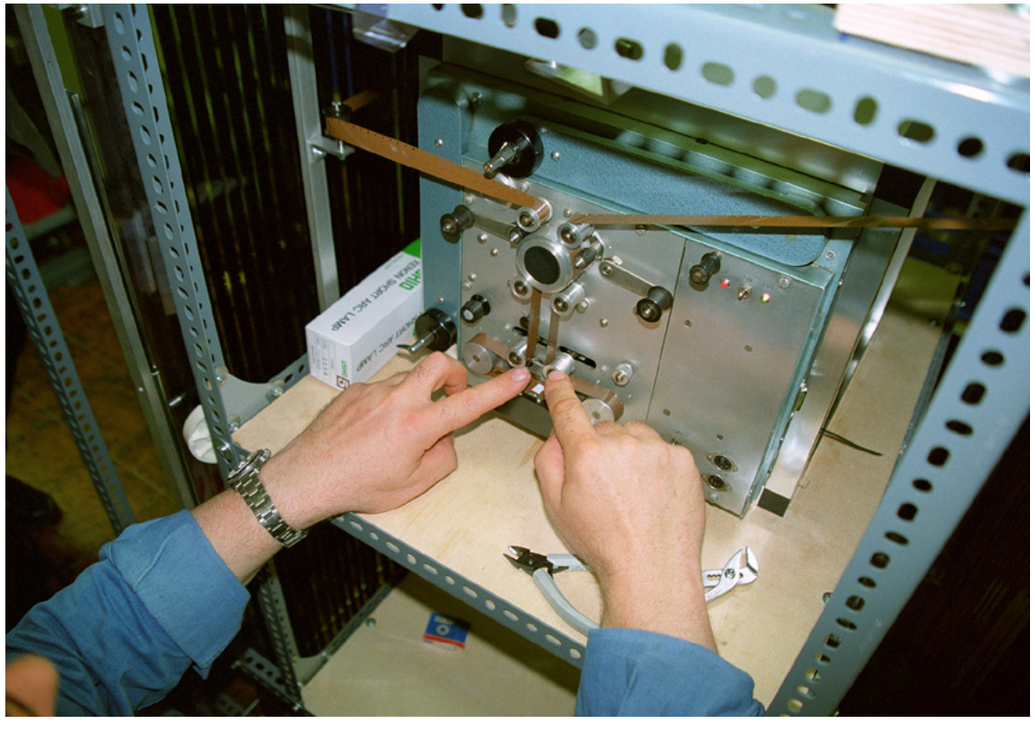

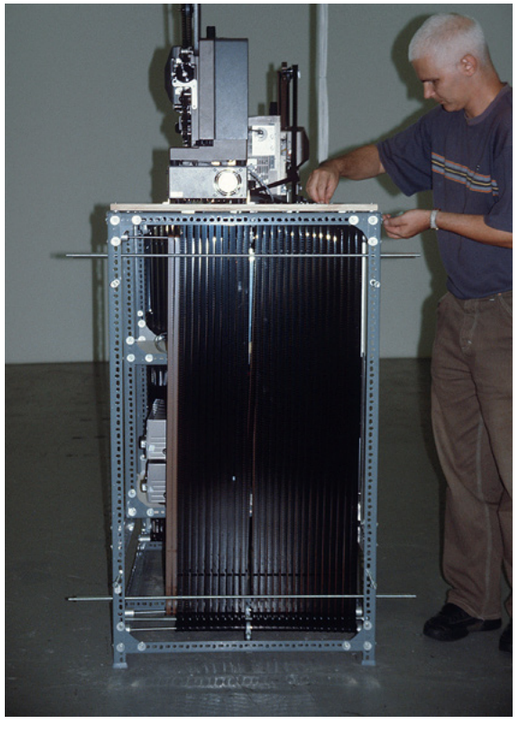

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figs. 27–28 Marijke van Warmerdam, *Heen en weer (Back and forth)*, 1997, screen print on paper, 118 × 175 cm / variable sizes, edition of 10 sets, each set 2: arrows, 20 stripes, shown at "Mitenand," Migros Museum für Gegenwartskunst, Zurich, 1997. Photo: Nils Klinger for Migros Museum für Gegenwartskunst, 1997.

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fig. 29 Marijke van Warmerdam, *Good days, bad days*, 1996, 110 × 80 cm, screen print on paper, edition of 2: 2 sets of 24 prints, numbered I/II–II/II, edition of 10: 10 sets of 50 prints, numbered 1/10–10/10, shown at "Mitenand," Migros Museum für Gegenwartskunst, Zurich, 1997. Photo: Nils Klinger for Migros Museum für Gegenwartskunst, 1997.

fig. 30 Marijke van Warmerdam, *Very good, very bad*, 1997, inlay in catalog *Single, double, crosswise*, screen print on 2 stickers, both 7 cm diameter, edition of 190, published by Stedelijk Van Abbemuseum, Eindhoven. Photo: Stedelijk Van Abbemuseum, 1997.

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fig. 31 Marijke van Warmerdam, *Don't walk, walk*, 1997, color photo, perspex, aluminium, 180 × 270 cm, edition of 5 + 1 AP, shown at "Celluloid Cave," Thread Waxing Space, New York, 1997. Photo: Galerie van Gelder, 1997.

fig. 32 Marijke van Warmerdam, *Chasing colours*, 1996, 16 mm film loop, color, 6 min 35 sec, projector, loop system, projection table, approx. 210 × 280 cm, edition of 3 + 1 AP, added: ProRes 422 HQ, aspect ratio 4:3, shown at "Produced by Migros," Kunsthalle Fridericianum, Kassel, 2011. Photo: Kunsthalle Fridericianum, 2011.

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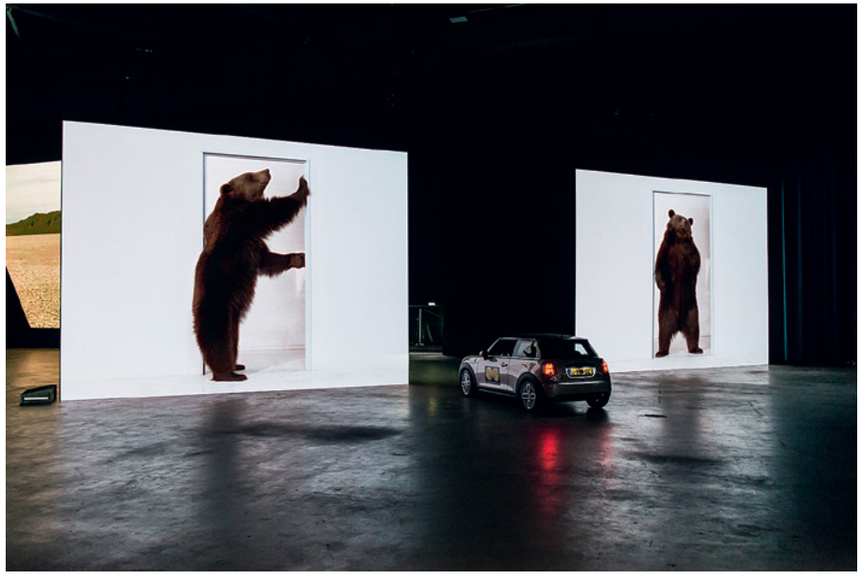

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fig. 33 Marijke van Warmerdam, *Dichtbij in de verte (Close by in the distance)*, 2011, Museum Boijmans Van Beuningen, Rotterdam. Photo: Lotte Stekelenburg for Boijmans Van Beuningen, 2011.

fig. 34 Marijke van Warmerdam, *Beer (Bear)*, 1997, 2 x 16 mm film loop, color, 6 min 6 sec / 3 min 53 sec, 2 projectors, 2 loop systems, 2 projection tables, approx. 210 × 280 cm each, edition of 3 + 1 AP, added: ProRes 422 HQ, aspect ratio 4:3, "Boijmans Ahoy Drive-thru Museum," Boijmans Ahoy, Rotterdam, 2020. Photo: Eva Faché for *De Volkskrant*, August 4, 2020.

Multiformité(s)
(Re)Exhibiting and (Re)Making Godard's *Le Livre d'image*

Jacqueline Maurer

17′

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Le Livre d'image (*The Image Book,* 2018–) (1) almost did not make its world premiere in the more than 2,000-seat Auditorium Louis Lumière at the Festival de Cannes in 2018. It also came close to not receiving the newly introduced Palme d'Or spéciale. The reason for this is that Jean-Luc Godard (1930–2022) had turned down director Thierry Frémaux's invitation to the festival when he visited the filmmaker at his home in the small Swiss town of Rolle. Godard claimed it was a film "pour le salon" (2) and should not be handed over, as is customary, to the film distributors as a Digital Cinema Package (DCP). When, shortly after this rejection, the Swiss Federal Office for Culture (FOC) denied his request for funding, Godard reconsidered Frémaux's offer. The FOC grant, which requires a theatrical release, was ultimately approved with the invitation to Cannes. However, the crux of this back-and-forth of rejections and acceptances—as Godard announced via video call at the press conference in Cannes—remains the idea of presenting *Le Livre d'image* outside of the large-scale, temporary cinema distribution system. Instead, it should be treated more like a "chamber film," (3) shown in small venues for many years. (4) Indeed, since its premiere, *Le Livre d'image*, which draws from *Histoire(s) du cinéma* (1988–98), has been circulating in at least three variable formats for public screenings: as an installation in a so-called *accueil* (a performance between an exhibition and a screening), as a theatrical version, and as an exhibition.

> I don't think there is a technically "right version" of the film. It consists more so in the open ensemble of its variations, its executions—like a piece of music. It's one of the exciting dimensions of the film: exploiting the technical deficiencies and aberrations in a supposedly "high-tech" world to the same extent as the capabilities and *multiformities* [emphasis mine]. For example, thanks to the *Livre d'image*, changes in format become a stylistic resource rather than remaining an inconvenience. The film is, in itself, experimental, and its release also becomes experimental. (5)

With "multiformités," (6) film scholar Nicole Brenez, who, as an *archéologue*, (7) significantly contributed to the collection of film fragments used in *Le Livre d'image*, addresses various aspects of format: the changing aspect ratios refer to different film formats, which, in Godard's understanding, imply an adjustment of what should be shown and what is shown as informed by the interplay of ethical, political, and economic interests. He clarified this already in his 2004

(1)
Le Livre d'image is a collective work by Jean-Luc Godard, Fabrice Aragno, Nicole Brenez, and Jean-Paul Battaggia produced by Casa Azul Films, Lausanne, in coproduction with Écran Noir Productions, Paris. For more information, see "*Le Livre d'image*," Casa Azul Films, https://casa-azul.ch/wordpress_X/livre-dimage/.

(2)
My thanks go to Fabrice Aragno, Nicole Brenez, and Michael Witt for the insightful exchanges.

(3)
Daniel Kasman and Kurt Walker, "The Chamber Piece: In Conversation with Fabrice Aragno," MUBI, video interview, May 17, 2018, 28:13, https://mubi.com/de/notebook/posts/the-chamber-piece-an-interview-with-fabrice-aragno.

(4)
Godard suggested showing it in a cheerful, festive, instructive, and thus by no means solemn atmosphere in small venues used for cultural, theatrical, and circus performances. "*Le Livre d'images* – Cannes 2018 – Conférence de Presse – VF," YouTube, video posted by Festival de Cannes (Officiel), May 12, 2018, 45:37, https://www.youtube.com/watch?v=T7zHGilVjXQ.

(5)
"[J]e ne pense pas qu'il existe une 'bonne version' technique du film, il consiste plutôt en l'ensemble ouvert de ses variations, de ses exécutions – à la manière d'une pièce de musique. C'est l'une des dimensions passionnantes du film: autant que les capacités et *multiformités* [emphasis mine], exploiter les déficiences et aberrations techniques dans un monde supposé 'high-tech.' Par exemple, grâce au *Livre d'image*, les changements de format deviennent une ressource stylistique au lieu de rester un inconvénient. Le film est en soi expérimental et sa sortie aussi devient expérimentale." Nicole Brenez in conversation with Stéphane Delorme, "Liber vs Biblos & Codex: Entretien avec Nicole Brenez," *Cahiers du cinéma*, no. 759 (October 2019): 26–28, here 26. (This and all subsequent translations, unless otherwise cited, are by Hayley Blair Haupt.) Witt already described *Histoire(s) du cinéma* as "a more complex integrated multiform work," Michael Witt, *Jean-Luc Godard, Cinema Historian* (Bloomington: Indiana University Press, 2013), 5.

(6)
From the Latin *multiformitas* (multiplicity of forms), s.v. "multiformité," *Centre National de Ressources Textuelles et Lexicales*, https://www.cnrtl.fr/definition/multiformit%C3%A9/substantif.

(7)
Brenez is credited under "archéologie," see, e.g., Jean-Luc Godard, *Le Livre d'image*, press release (Théâtre Vidy-Lausanne, 2018), 2.

Cahiers du cinéma contribution "Formats" with a sketch and two photograms taken from *Notre Musique* (2004): Godard wanted the film to be projected in the then obsolete ratio of 1.37:1, as he considered this an appropriate format for showing people and modern-day Sarajevo with its buildings still marked by war. According to Godard, the dominant widescreen formats in movie theaters operate in a manner comparable to currencies and transactional modes. In this sense, converting currency can mean the compressing, stretching, or even cropping of images and thus, as illustrated in the example cited, an encroachment on the integrity of the person and a concealing and covering-up of historical evidence of acts of violence. *Le Livre d'image* draws attention to this again by jumping between formats within the same clip—a not insignificant option offered by the home cinema. Thus, the jumping is to be read not only in an aesthetic sense as a "*resource stylistique*" (8) but also in terms of the economic logic of transactions and circulation, which plays a fundamental role in determining the choice of production and projection format. (9)

Film formats co-write the history of cinema. For his historiography, Godard continued creating montages in analog form on HDCAM video cassettes and made ample use of the archival video material from his *Histoire(s) du cinéma*. He was technically, and in digital processing, supported by long-time close collaborator Fabrice Aragno. The materiality, conditions, and possibilities of the respective film format are transferred to the picture—the changes in color that the magnetic videotape experiences as it ages or is exposed to external influences, the exploration of the range of colors by adjusting the settings on digitized sources and digital recordings—and create forms of visibility beyond high fidelity (figs. 1–3).(10)

Because of its construction as a multitude of images and sounds that constantly challenges the beholder's attention and memory, *Le Livre d'image* has the potential to offer a new experience at every screening. The *multiformité* of the variable presentation formats contributes to this even if the theatrical version was an unavoidable prerequisite, as stipulated by the grant, for its release at the festival and in cinemas. (11) Godard and Aragno neither could nor wanted to plan the installations entirely. This is because they still preferred taking a deliberately open-ended approach through the distribution system they introduced, which notably requires the involvement of and creative openness from the venues and funding institutions. The venues—far from movie theaters—play an active part and open possibilities beyond those offered by the program structures of the movie theater, with its limiting infrastructures regarding technical customization among other things. No trace of a conventional theatrical release remains (at least almost); the screenings and exhibitions of *Le Livre d'image*, which could potentially circulate for several years, are becoming a perpetually novel cinematic experience with a theatrical and museum-like character in which the hosts, visitors, and not least of all the architecture and furnishings are to be involved in equal measure. (12)

The following observations and considerations are concerned with how *Le Livre d'image* developed during its first installation and exhibition, the continuity, and the consistency of these prototypical formats in Godard's oeuvre, and finally what this opens up.

(8)
Brenez, "Liber vs Biblos & Codex," 26.

(9)
Jean-Luc Godard, "Formats," *Cahiers du cinema*, no. 591 (June 2004): 78; see also James Quant, "Here and Elsewhere: Projecting Godard," in *For Ever Godard*, ed. Michael Temple, James S. Williams, and Michael Witt (London: Black Dog Publishing, 2004), 126–39, especially 135–37; and David Joselit, "Formats," in *After Art* (Princeton, NJ and Oxford: Princeton University Press, 2013), 55–84.

(10)
See David Joselit's (normative) requirement of a work of art, which *Le Livre d'image* clearly meets: "I believe image power—the capacity to format complex and multivalent links through visual means—is derived from networks rather than discrete objects. This means that works of art must develop ways to build networks into their form by, for example, reframing, capturing, reiterating, and documenting existing content—all aesthetic procedures that explicitly presume a network as their 'ground.'" Joselit, *After Art*, 94.

(11)
The film has since been released on DVD and Blu-ray, was shown on television, and was available in the broadcasters' media libraries. There is also a facsimile edition, called a *livret* (booklet), of one of Godard's Moleskine notebooks in which he developed and illustrated the subtitles required for Cannes. The process of printing the facsimile at Imprimerie Genoud in Lausanne was made into a short film: *Impression Livret "Le Livre d'Image" JL Godard mai 2018,* Vimeo, video posted by Casa Azul Films, February 25, 2019, 03:33, https://vimeo.com/319496892. The book edition is sold at the venues of the *accueils* and exhibitions and can also be purchased directly at the film production cooperative Casa Azul Films.

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figs. 1–3 Jean-Luc Godard, Fabrice Aragno, Nicole Brenez, and Jean-Paul Battaggia, *Le Livre d'image (The Image Book)*, 2018, HD video, color, sound, 85 min. © Casa Azul Films & Ecran Noir Productions.

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figs. 4–6 *Le Livre d'image* at Théâtre Vidy-Lausanne, Switzerland, November 2018. © Jacqueline Maurer.

6

Théâtre Vidy-Lausanne (November 16–30, 2018)

For the first *accueil* of *Le Livre d'image*, the Théâtre Vidy-Lausanne welcomed visitors to its building, designed by former Bauhaus student Max Bill using a lightweight, prefabricated construction method for the Swiss national exhibition "Expo 64." In the foyer, enlivened by a café and a bookshop with a view of Lake Geneva, collages by Godard and galley proofs from the book edition of *Le Livre d'image* could be viewed on two side walls during the course of the presentation of film performances on stage. The famous multifunctional Ulm stool, bearing the branded signature of designer, architect, sculptor, painter, and graphic artist Max Bill, was integrated into the small exhibition. One stool took on the function of a stepping stool, allowing visitors to better view proofs hung high on the walls; others were piled on top of one another below Godard's collage, forming a pedestal-like sculpture. The white side walls of the public foyer, now serving as exhibition walls, were reminiscent of white cube galleries but were simultaneously part of everyday life at the café. The counterpart to this was the theater hall's passage-like anteroom, accessible only with a ticket. As a black box, it brought together a cloakroom and other collages. Located front and center on the small stage of the Passarelle theater hall, which is level with the audience seats, stood a flat-screen monitor on a console table; next to it was a stool with technical equipment placed on top of it. A floor lamp illuminated the book *Images en parole* by Anne-Marie Miéville,(13) Godard's partner in life and work. The publication lay on a small carpet in front of the monitor. With its unofficial subtitle, *Image et parole*, *Le Livre d'image* establishes an essential link to Miéville's work. Large Persian rugs covered the stage floor; paintings, namely copies of works by well-known artists including Rembrandt and August Macke, hung or were propped against the side walls; and loudspeakers stood on the floor or atop other wooden stools. Also visible was a poster from Michelangelo Antonioni's *L'Avventura* (*The Adventure*, 1960), as seen in *JLG/JLG Autoportrait du décembre* (*JLG/JLG Self-Portrait in December*, 1995), in which Godard shows himself at his home in Rolle and on the shores of Lake Geneva. These personal objects from the not-so-distant area where Godard lived and worked had now been transferred here to the shores of Lausanne.(14) The set in the black, cubical theater hall, with Godard's brown armchair facing the audience, was backed by a white curtain, like a projection screen (figs. 4–6).

A theater employee would enter the stage, turn off the light, and start the film. Viewers' eyes were captivated by the sharp, glowing, jumping film fragments; the changes in format; and the oversaturated colors on the screen. The sound, which Godard used independently of the images, attracted equal attention as soon as the two soundtracks containing quotations and fragments from films and pieces of music along with Godard's voice from different times began shifting between the spatial planes of the room. The film was also projected on the white screen hanging on the back wall of the stage, but with reduced brightness and color values, as it was projected indirectly from behind. The flat-screen monitor at the front edge of the stage thus also acted as a mirror. The echo-like reflections enveloped the stage set, based on Godard's living room, in pale, flickering light.

In an interview published in *Cahiers du cinéma*, Aragno stated, "for the presentation at the Théâtre Vidy-Lausanne, Jean-Luc

(12) In October 2019, then theater and stage director Philippe Quesne used *Le Livre d'image*'s invitation as an opportunity to take visitors behind the scenes of the Théâtre Nanterre-Amandiers in France before its renovation. They explored the soon-to-be-defunct space from the 1970s through a series of installations with films by Jean-Luc Godard, Fabrice Aragno, Anne-Marie Miéville, and Paul Grivas, and an interview with Godard by Jean-Paul Török, *Initiation au cinéma révolutionnaire*, filmed in 1969.

(13) Anne-Marie Miéville, *Images en parole* (Tours: farrago, 2002).

(14) Since December 2019, the Fondazione Prada in Milan has hosted "Jean-Luc Godard: Le Studio d'Orphée," a permanent installation that builds on the *mise en scène* in Lausanne and, in addition to *Le Livre d'image*, shows 9 exclusive films by Godard. Because of the pandemic, the permanent installation was closed in March 2020, and it only reopened two years later.

just said he would like his living room to be transported: 'people might as well see the film as I see it.'" (15) Visually, the intimate cinematic experience created by Godard and Aragno on location drew on the original experience in Godard's home film studio and home cinema. Acoustically, it was expanded to include the sound montage developed for the Cannes premiere. There, the two soundtracks Godard switched between in his home film studio were distributed onto the 7.1 Dolby Surround Sound System of this traditional cinema equipped with the latest technology. At Vidy, the intimate screening situation for no more than one hundred visitors offered an installation-style (home) cinema performance based on *Le Livre d'image*, in which the audience, absorbed by the loudspeakers, was always aware of their position in the theater hall. Due to the flickering light shining through the screen in the background, the Godardian décor was also always visually present—except for the numerous times the film faded to black. These moments of darkness opened spaces of projection and imagination for what has been seen and remembered, triggering images in the minds of those present. The flat, moving images on the monitor, which soon lit up again, were spatialized by the light reflecting off the faces of the viewers opposite them and the screen hung at the back of the stage as well as through the acoustic anchors all around. With *Le Livre d'image*, the theater hall, with its descriptive name, *La Passerelle*, became a gateway from (re)production space to presentation space(s). As Aragno explains, "those who present the film have to propose another form—not to Godard but to the film and its spectators. The one who receives the film also becomes the author." (16)

What Godard named a "zone d'hospitalité" at the Théâtre Vidy-Lausanne, where his and Aragno's personal vision of the film was first transposed, offered a field of experimentation for a prospective, intentionally variable installation that could be customized by other engaged hosts. By (co-)developing and montaging "another form," (17) as Aragno put it, they continue Godard's constant exploration of cinema as a "forme qui pense." (18) Since the premiere at the Vidy, Aragno has helped design *accueils* in such diverse locations as a hotel lobby in Rotterdam during the city's film festival, and in Switzerland in a converted church in La Chaux-de-Fonds and in the library of the Fondation Jan Michalski literary center in Montricher. The creators' intention is to always explicitly draw from the spatial characteristics of the specific venue to create a thoroughly site-specific cinematic experience beyond that offered by the classic movie theater. With it comes the suggestion that the host institutions make the basic installation of a flat-screen monitor and loudspeakers their own. Ideally, this setup should be used even beyond screenings of *Le Livre d'image* to the extent that it becomes part of the venue for the time it is there.

In an installation-based and simultaneously adaptable format, *Le Livre d'image* unfolds again and again as a stage setting and an exhibition spread throughout several rooms, with the architectural, historical, and material properties *Le Livre d'image* communicates. Kathrin Busch defines exhibitions as a deactivation of a creative process. (19) In the case of *Le Livre d'image*, however, a finished film project is subjected to repeated activation by the viewers and their associations and memories. This occurs when people repeatedly set

(15)
"Pour le projet de présentation au Théâtre Vidy-Lausanne, Jean-Luc a juste dit qu'il aimerait qu'on transporte son salon: '*Autant que les gens voient le film comme je le vois*.'" Fabrice Aragno in conversation with Joachim Lepastier, "Image et matière: Entretien avec Fabrice Aragno (January 25, 2019)," *Cahiers du cinéma*, no. 759 (October 2019): 30–33, here 33.

(16)
"Celui qui accueille le film doit proposer, pas à Godard, mais au film et à ses spectateurs, une autre forme. L'auteur devient aussi celui qui accueille." Aragno, "Image et matière," 33.

(17)
Aragno, in conversation with the author, October 20, 2020.

(18)
Jean-Luc Godard, *Histoire(s) du cinéma* (Paris: Gallimard-Gaumont, 1998), 55. For further elaborations, see Volker Pantenburg, "Montage and Cinematic Thinking," in *Film as Theory: Farocki/Godard* (Amsterdam: Amsterdam University Press, [2006] 2015), 68–72; and Jacques Aumont, *Montage: "La seule invention du cinéma"* (Paris: Librairie Philosophique J. Vrin, 2015).

(19)
Kathrin Busch, "Figuren der Deaktivierung," in *Ausstellen: Zur Kritik der Wirksamkeit in den Künsten*, ed. Kathrin Busch, Burkard Meltzers, and Tildo von Oppeln (Zurich and Berlin: diaphanes, 2016), 15–36, here 15.

(20)
Brenez, "Liber vs Biblos & Codex," 26.

(21)
For further information about the exhibition and its program, see "sentiments, signes, passions. Une exposition de Jean-Luc Godard," Le Chateau de Nyon, https://www.chateaudenyon.ch/fr/expositions/sentiments-signes-passions-une-exposition-de-jean-luc-godard-458.

hand to an open, experimental exhibition format, in the sense of the "open ensemble" (20) mentioned by Brenez.

Château de Nyon (June 12–September 13, 2020)

In the exhibition "sentiments, signes, passions – à propos du livre d'image" (21) in summer 2020, *Le Livre d'image* was spatially and temporally expanded as a "polyfocal installation structure," (22) to use Ursula Frohne's insightful terminology. The concept of the first exhibition (23) was developed by Aragno, who was responsible for the *mise en œuvre* of the "cinematographic installations." (24) It *demontaged* the film and redistributed its sequences in a new way, thereby generating associations discovered on site and those yet to be discovered. These associations included those between film set pieces; rooms in a medieval castle, which was recently converted into a museum; and the urban and natural surroundings framed by various windows and their formats. The opportunity to invite visitors to another "sensorial-aesthetic experience" (25) of *Le Livre d'image*, in which they could experience an "individualization of [their] filmic experience," (26) as they were free to determine the course and length of their stay themselves, came about by chance during the brainstorming and (27) implementation process (fig. 7). (28)

After climbing the medieval spiral staircase from the museum's entrance area set up in the basement, visitors entered the space used for special exhibitions on the ground floor of the city's castle towering above Lake Geneva. Here they found the film's six chapters (29) dispersed throughout the main rooms and sequences designed as transitional cinematic moments in two bay windows and two circulation areas. The multiple film and audio fragments, played back in a new aleatoric order, were fed via Raspberry single-board computers into approximately forty monitors and twenty loudspeakers. All existing displays were removed and stacked as a partition or integrated as toppled pedestals. At the same time, the Ikea shelving system Ivar, as well-known as it is commonplace, found its way into the historical space. It served as a means of organizing the rooms and displaying equipment, lamps, art books, pages from books, art prints, photographs, and nameplates. (30) Godard had long used the practical and inexpensive shelving as bookshelves in his home and as an organizational system in the film studio he set up in his nearby hometown of Rolle in the late-1970s. As visible in a photograph in the first exhibition room, he also used the shelves, which are customizable in number, more specifically for the collection of book and image references and to organize his film projects thematically. In addition to the high-end devices available in the museum, dozens of used television and computer monitors from the area, purchased from private sellers through an online platform; chairs from secondhand stores; and furniture from the castle museum were incorporated into the expansive *Le Livre d'image* exhibit. Together, these elements created a "space of dialog" (31) in Nyon or, more aptly, "a constellative field of reception," as Paolo Bianchi put it. (32) The architecture and the atmospheres created by the changing light throughout the summer days were also incorporated. Drawn curtains darkened rooms while colorful curtains bathed others in colored light, in which the changing images on the monitors also radiated. By utilizing wall sections below eye level, skirting boards, and the floor as exhibition

(22)
"polyfokales Installationsgefüge," Ursula Frohne, "Moving Image Space: Konvergenzen innerer und äußerer Prozesse in kinematographischen Szenarien," in *Kinematographische Räume: Installationsästhetik in Film und Kunst*, ed. Ursula Frohne and Lilian Haberer (Munich: Fink, 2012), 447–96, here 453.

(23)
The second exhibition, entitled "Sentiments, Signes, Passions: Zu Godards *Le livre d'image*," was held at the Haus der Kulturen der Welt (HKW) in Berlin from February 10–April 24, 2022 and could be accessed for free, see "Sentiments, Signes, Passions," HKW, https://www.hkw.de/de/programm/projekte/2022/sentiments_signes_passions/start.php.

(24)
The term is taken from Juliane Rebentisch, who emphasizes that one should only talk about installations "in cases where the work operates with this structure of temporal openness, that is, work that reflects on the specific conditions of its presentation and reception." Juliane Rebentisch, "Cinematographic Installation (Boris Groys, Walter Benjamin)," in *Aesthetics of Installation Art*, trans. Daniel Hendrickson with Gerrit Jackson (Berlin: Sternberg Press, 2012), 171–96, here 185.

(25)
"sinnlich-ästhetischen Erfahrung," Frohne, "Moving Image Space," 453.

(26)
Rebentisch, "Cinematographic Installation," 181.

(27)
The separate image and sound cycles of the film chapters each time followed a different variation of Mallarmé's phrase "nouveau coup de dés qui n'abolira pas le hazard," scripted and coded by Fabrice Aragno. See Stéphanie Serra, "*Relire un film: Sentiments, signes, passions, à propos du Livre d'Image* de Jean-Luc Godard (Château de Nyon, du 12 juin au 13 september 2020)," *Decadrages*, nos. 46/47 (2022): 209–35, here 233.

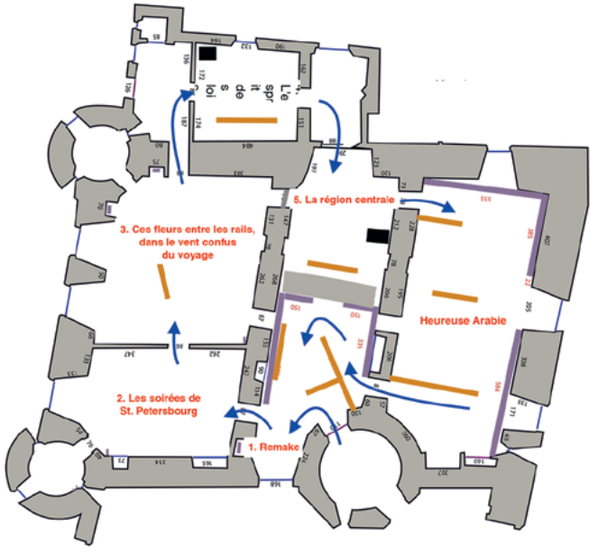

fig. 7 Plan of the exhibition "sentiments, signes, passions – à propos du livre d'image" at Château de Nyon, Switzerland, June–September 2020. © Fabrice Aragno.

surfaces, Aragno also placed the rooms' construction, materiality, and textures on display.

Between the visitors circulating and those standing still, the monitors, shelves, interior spaces, and exterior spaces visible through partly opened windows, the aleatoric visual and auditory presentation of the film generated an infinite number of possible perspectives, framings, and "rapprochements" (33) beyond the cinematic images, which visitors could individually montage for as long as they chose to stay. Joachim Paech attempted to define "*l'entre-images*," as Raymond Bellour describes his concept, (34) as an either-or. As suggested here, in the case of *Le Livre d'image*, in its first presentation in the format of an exhibition in a museum, both sides of Paech's definition are intertwined (figs. 8–11): the *entre-image* generated by the exhibition formed a "kind of territory, which organizes a dispositive system of seeing between the images [and] a structure, the overdetermination of which sets semiotic functions in motion." (35)

The exhibition, which followed a counterclockwise course that began and ended in the same room, invited visitors on a "voyage" (36) "inside the film of Godard." (37) The trip through (cinema) history evoked in part curatorially conscious but ultimately free interpretations. (38) In particular, the interaction between *Le Livre d'image* and the specific exhibition venue and its surroundings contributed to this. The site's architecture, visibly layered by additions and fractures, and its context in the cultural landscape and urban development bespeak permanence and history. The opened windows, some with crown glass panes and still fitted with grates, framed the landscape, inviting modern-day city life into the medieval rooms temporarily animated by the historical and contemporary world of images and sounds of *Le Livre d'image*. The various monitors used for the exhibit and chairs taken from living rooms in the surrounding area ended up in this former castle room, which was also displayed as an ordinary, modern-day museum room. Here, fifteen kilometers away from where Godard had lived and worked, and embedded in the everyday life of the museum and town, *Le Livre d'image* manifested itself at the intersection of art and history, war, and the present. By montaging *Le Livre d'image* anew, visitors who opened themselves to this expansive image and sound experiment that constantly reshaped itself became a part of it. The wide variety of seating options invited them to linger and watch, hear, and feel, before they were quickly distracted and attracted by other room arrangements and lines of sight, by other images and sounds in interior and exterior spaces. Not only was the fixed viewer position in the cinema "centrifugally unbound in the installative moving image spaces;" (39) the exhibition itself presented the centrifugal and open form of montage Georges Didi-Huberman already described in discussing *Histoire(s) du cinema*. (40) The countermovement to this, however, was also at work: in the central, darkened room, dedicated to the work's short fifth chapter, "La région centrale" (*The Central Region*)—based on Michael Snow's experimental film from 1971—the visual and auditory impressions were concentrated on the eyes of Natalya and Vasyl from Alexander Dovzhenko's *Earth* (1930) and images of hands reaching for each other throughout film history. The peaceful calm felt here was soon broken by various sounds, including those of music and exploding bombs, emanating from the surrounding rooms.

(28)
Aragno repeatedly emphasized the centrality of chance and playfulness in Godard's work and their work together. The project's initiator Emilie Bujès, who, as director of the documentary film festival Visions du Réel, invited Godard to produce a portrait of the city of Nyon, Switzerland. The financing fell through, but rooms in the city palace were available, which led to the creation of an exhibition version of *Le Livre d'image*.

(29)
1. "Remakes;" 2. "Les soirées de Saint-Pétersbourg" [St Petersburg Dialogues] (Joseph de Maistre); 3. "Ces fleurs entre les rails, dans le vent confus des voyages" [Like flowers along the tracks, shuddering as the train roars by] (taken from Rainer Maria Rilke, *The Book of Poverty and Death*); 4. "L'esprit des lois" [The Spirit of the Laws] (Montesquieu); 5. "La région centrale" [The Central Region] (Michael Snow); "L'Arabie heureuse" [Arabia Felix] (Albert Cossery, Alexandre Dumas, Frederic Prokosch).

(30)
The names included those of political activists, dissidents, scholars, communists, pacifists, and revolutionaries from Switzerland—a group of people whom Godard not only honored here but, considering his attitude and actions, to whom he may have felt indebted.

(31)
"Dialograum," see Paolo Bianchi, "Die Ausstellung als Dialograum," *Kunstforum International* 186 (June/July 2007): 82–83. See also Paolo Bianchi, "Das 'Medium Ausstellung' als experimentelle Probebühne," *Kunstforum International* 186, (June/July 2007): 44–55.

(32)
"ein konstellatives Rezeptionsfeld," Frohne, "Moving Image Space," 453.

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9

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figs. 8–11 Fabrice Aragno and Jean-Luc Godard, "sentiments, signes, passions – à propos du livre d'image," exhibition views, Château de Nyon, Switzerland, June–September 2020. © Jacqueline Maurer.

11

Consistency and Continuity

In preferring to circulate *Le Livre d'image* outside of the usual film distribution channels and allowing the *montage project* to be reassembled in variable installation formats through the visitors' interventions, the filmmaker was not breaking any new ground as he approached the end of his career. In the context of *Histoire(s) du cinéma*, Godard regretted not having created an exhibition. The over-four-hour-long *magnum opus* was produced by and for television; released on VHS, DVD, and as a CD; published as a book in four volumes and later as a single volume; and finally shown in movie theaters in a shortened version, entitled *Moments choisis des Histoire(s) du cinéma* (2005). The exhibition project initiated by Dominique Païni in the early 2000s at the Centre national d'art et de la culture Georges-Pompidou was the occasion for the "multimedia installation artist" (41) to spatially interpret his *Histoire(s) du cinéma* and thus his montage concept as a model. The result, "Collage(s) de France: Archéologie du cinéma d'après JLG," however, ignored the exhibition space almost entirely. (42) The space in question is the Centre Pompidou's 1,200-square-meter, column-free Galerie Sud on the ground floor, three sides of which are entirely made of glass, thus opening it to the bustling outdoor environment in the heart of Paris. Since its opening in 1977, this gallery, exposed to everyday city life, has been dedicated to experimental contemporary art. However, in its spatial concept, "Collage(s) de France" still followed the principle of the white cube with Godard's proposed installation of nine cells almost entirely cut off from the outside world. Inside, visitors would have been able to experience his universe in a "space of experience" (43) like exhibitions have wanted to create since the 1960s and increasingly since the 1990s. The quickly created final show, "Voyage(s) en utopie, Jean-Luc Godard (1946–2006): À la recherche d'un théorème perdu," (44) rebelled against this concept and thus against what Brian O'Doherty had already criticized in his famous work in 1976: "Unshadowed, white, clean, artificial—the space is devoted to the technology of esthetics." (45) In this institutional-critical act, Godard also broke with the bourgeois exhibition ritual that, according to Tony Bennett, has shaped museums since the 19th century: "Going to a museum, then as now, is not merely a matter of looking and learning; it is also—and precisely because museums are as much places for being seen as for seeing—an exercise in civics." (46) Godard carried out the deconstruction quite strikingly in a literal dismantling by literally breaking open the exhibition display that had to be neatly prepared to expose the production process, the constructedness of an exhibition oscillating between ruin and construction site: In some places, he left off the side panels on the white exhibition walls that were brought into the space, thereby exposing their simple construction and the playback devices placed inside them. Additionally, holes were drilled through walls lined with the black cables from the monitors and, in several places, hastily painted with rough brushstrokes. Visitors circulated among the models of the first exhibition; numerous different monitors; three original paintings from the Musée d'art moderne at Centre Pompidou; reproductions; text fragments; Ikea furniture; and construction site materials, such as grating fences, construction barriers, scaffolding, EPAL Euro pallets, painter's trestles, and bricks. In the process, the three consecutive rooms increasingly opened themselves

(33) With his montage principle, Godard references Paul Reverdy: "[L'image] ne peut naître d'une comparaison mais du rapprochement de deux réalités plus ou moins éloignées. Plus les rapports des deux réalités rapprochées seront lointains et justes, plus l'image sera forte – plus elle aura de puissance émotive et de réalité poétique." Paul Reverdy, "L'Image," *Nord-Sud*, no. 13 (March 1918): n.p. See also Robert Bresson, *Notes sur le cinématographe* (Paris: Gallimard, [1975] 1988), 52. On critical discussions of Godard's montage principle, see Georges Didi-Huberman, "À couteaux tirés ou de la politique (divisée)," in *Passés cités par JLG* (Paris: Les Éditions de Minuit, 2015), 87–119; and Georges Didi-Huberman, "Montage-Image or Lie-Image," in *Images in Spite of All: Four Photographs from Auschwitz* (Chicago: University of Chicago Press, [2003] 2008), 120–50. See also Pantenburg, "Montage and Cinematic Thinking," 68–72.

(34) Raymond Bellour, *L'Entre-Image: Photo, Cinéma. Vidéo* (Paris: La Différence, 1990), 12.

(35) "eine Art Territorium, das zwischen den Bildern eine dispositive Ordnung des Sehens organisiert [und] eine Struktur, deren Überdeterminierung semiotische Funktionen in Gang setzt." Joachim Paech, "Das Bild zwischen den Bildern," in *Film, Fernsehen, Video und die Künste*, ed. Joachim Paech (Stuttgart: J. B. Metzler, 1994), 163–78, here 164.

(36) As described by Aragno during a guided tour on August 26, 2020.

(37) Fabrice Aragno and Jacqueline Maurer "Exhibiting Jean-Luc Godard's *Le Livre d'image* (2018–)," conversation organized as part of the video symposium "Taking Measures: Usages of Film and Video Art," October 30, 2020, 39:08, https://takingmeasures.ch/videos/exhibiting-jean-luc-godards-le-livre-dimage-2018/.

to the exterior space. The exposing of the actual assembly of the exhibition—drawing from the architecture's concept of "inside turned outside" (47)—went hand in hand with the task assigned to the visitors (the French word for task, *devoir*, is reminiscent of *de voir*, meaning *of seeing*) and, at the same time, the freedom they were given to create an "infinity of possible montage constructions." (48) They did so by moving around, bending down, turning their heads, directing their gaze, and pricking up their ears so as to constantly guide their attention and imagination through this visual and acoustic multiplicity in different directions. The non-hierarchical, disbanded structure left visitors apparently lost and thus also defied the organized and regularized format of the exhibition in its more current redefinition "as a cultural format, a ritual of individual and intersubjective self-formation, self-differentiation, and self-reflection," as defined by Dorothea von Hantelmann and Carolin Meister. (49)

The exhibition and activation of *montaging* and *demontaging* in the dialog between the cinema and the presentation space thus also form the central theme running through the "cinematic spaces," (50) beyond classic movie theaters, that *Le Livre d'image* opens. This is entirely in the spirit of Beatrice von Bismarck's analysis of the "de-contextualization and re-contextualization of the exhibition [as] part of a montage process in the Benjaminian sense, which disrupts the context in which something is montaged" (51) and produces a distancing effect. Through the expansion of the format according to the spatial structure and historicity of the venue and the deliberate cinematic experience created in the here of the location and now of the moment, the distance between the visitors and what they see and hear is once again reduced. The "realité poétique" (52) implies a *réalité politique*, insofar as the hosts and the viewers are asked to relate to what they encounter and take a stand.

The *multiformités*—as they expand Godard's constant exploration of conditions and possible variations in the production, distribution, and reception of cinema within the film and its form(at)s of presentation—draw as much from the past as they anticipate the future. *Histoire(s) du cinéma*, on which *Le Livre d'image* builds, initially appeared in media and formats for private film viewing; in the form of a video montage, Godard reflects on (film) history and (hi)stories and the possibilities and duties of the cinema. With *Le Livre d'image*, which has recently begun to relate to current world events, a complementary action also takes place regarding the specific public institutional venues and their active inclusion in the reception. Aragno emphasizes the intention to "recreate a cinematic space." (53) This not only facilitates the recourse he mentioned to the beginnings of cinema with the Lumière brothers, who created collective cinema experiences and cinematographic spaces before movie theaters established themselves as standard. "Remakes," which the first chapter of *Le Livre d'image* cinematically explores, could refer equally to those re-productions and the multiplication of variations created with every subsequent performative installation and exhibition of *Le Livre d'image*, which is repeatedly *montaged* and *demontaged* on site and thereby repeatedly accessed and altered. In this way, hosts and recipients alike are encouraged to revise, explore, and experience Godard's cinema actively as a "forme qui pense" (54) and, in doing so, cinema's ongoing *search for montage*. (55)

(38) Aragno's occasional presence for guided tours was apparently not sufficient as a format for communicating with visitors. Shortly after the exhibition's opening, the museum requested an audio guide. QR codes were then used to guide visitors to the popular online video platform Vimeo on which Aragno had uploaded his and Godard's statements. In this way, their voices led to another level of apparatuses and sound through the visitors' smartphones.

(39) Frohne, "Moving Image Space," 454.

(40) "In *Histoire(s) du cinéma*, Jean-Luc Godard created a kind of montage that makes documents, citations, and film clips whirl toward a space that is never covered: a centrifugal montage, an elegy of speed. It is [...] like a great fugue running through the four and a half hours of the film." Didi-Huberman, "Montage-Image or Lie-Image," 125. This centrifugal form of montage is linked with that of André Malraux, whose *Musée imaginaire* was known to have been highly esteemed by Godard and was an essential reference for *Histoire(s) du cinéma*. See Georges Didi-Huberman, "Experimentieren, um zu sehen," *Zeitschrift für Ästhetik und Allgemeine Kunstwissenschaft* 57, no. 2 (2012): 197–213. On Godard and Malraux, see also Michael Witt, "Art Historians," in *Jean-Luc Godard, Cinema Historian*, 85–90.

(41) Michael Witt, "Shapeshifter: Godard as Multimedia Installation Artist," *New Left Review*, no. 29 (September/October 2004): 73–89.

(42)
The (home) video *Reportage amateur (maquette expo)*, produced by Godard and Anne-Marie Miéville in 2005, offers a unique insight into Godard's thinking. It was created to give museum staff a better understanding of the exhibition concept, which underwent numerous changes, through a guided tour of the complete model. The individual models Godard, Nathalie Crinière, and Jacques Gebel created were auctioned off after the exhibition and displayed for the first time in Miguel Abreu's New York gallery in 2018. See "Memories of Utopia: Jean-Luc Godard's 'Collages de France' Models," Miguel Abreu Gallery, http://miguelabreugallery.com/exhibitions/memories-of-utopia/.

(43)
"Erfahrungsraum," Dorothea von Hantelmann and Carolin Meister, "Einleitung," in *Die Ausstellung: Politik eines Rituals*, ed. Dorothea von Hantelmann and Carolin Meister (Zurich and Berlin: diaphanes, 2010), 7–18, here 16.

(44)
Michael Witt offers a photographic overview of the exhibition, "Documentation: 'Voyage(s) en utopie,'" *Rouge* (September 2006), http://www.rouge.com.au/9/godard.html. See also the documentary film by Olivier Bohler and Céline Gailleurd, *Jean-Luc Godard: Le désordre exposé* (2012). On the history of the exhibition, see especially Anne Marquez, *Godard, le dos au musée—histoire d'une exposition* (Dijon: Les presses du réel, 2014); Dominique Païni, "D'après JLG...," in *Jean-Luc Godard: Documents*, ed. Nicole Brenez et al. (Paris: Éditions du Centre Pompidou, 2006), 420–26.

(45)
Brian O'Doherty, "Notes on the Gallery Space," in *Inside the White Cube: The Ideology of the Gallery Space*, (Berkeley, Los Angeles, and London: University of California Press, [1976] 1999), 13–34, here 15. On the floors of the museum, the architects Renzo Piano and Richard Rogers, and engineer Peter Rice created open gallery spaces the size of two football fields. In the 1980s, solid walls were installed. See Dominique Bozo and Catherine Millet, "Le retour au musée: Entretien avec Catherine Millet," *artpress*, no. 6 (September 1982), reprinted in *Les grands entretiens d'artpress: Le Centre Pompidou*, ed. Christine Delaite (Paris: artpress, 2017), 24–43, especially 31–35.

(46)
Tony Bennett, *The Birth of the Museum: History, Theory, Politics* (London and New York: Routledge, 1995), 102.

(47)
Stephen Gardiner, "The Culture Factory: Inside outside," *Observer*, February 6, 1977.

(48)
Daniel Fairfax, "Montage(s) of a Disaster: 'Voyage(s) en utopie' by Jean-Luc Godard," *Cinéma Journal* 54, no. 2 (Winter 2015): 24–48, here 47.

(49)
"als ein kulturelles Format, als Ritual einer individuellen und intersubjektiven Selbstformung, Selbstdifferenzierung und Selbstreflexion," Von Hantelmann and Meister, "Einleitung," 18.

(50)
Aragno, in conversation with the author, October 30, 2020.

(51)
Beatrice von Bismarck, "Ausstellen und Aus-setzen: Überlegungen zum kuratorischen Prozess," in *Ausstellen: Zur Kritik der Wirksamkeit in den Künsten*, ed. Kathrin Busch, Burkard Meltzers, and Tildo von Oppeln (Zurich and Berlin: diaphanes, 2016), 139–56, here 141 ("De-Kontextualisierung und Neu-Kontextualisierung des Ausstellens [als] Teil eines im Benjamin'schen Sinne verstandenen Montageverfahrens, das den Zusammenhang, in den etwas montiert wird, unterbricht"). See also Walter Benjamin, "Der Autor als Produzent," [1934] in *Gesammelte Schriften*, vol. 2, ed. Rolf Tiedemann and Hermann Schweppenhäuser (Frankfurt am Main: Suhrkamp, 1997), 683–701.

(52)
Reverdy, "L'Image," n.p.

(53)
"Recréer un lieu de cinema," Primo Mazzoni and Fabrice Aragno in conversation at the cinema Filmpodium, Zurich, December 10, 2020.

(54)
Godard, *Histoire(s) du cinéma*, 55. On cinema's search for montage, see the filmed conversation, "Entretien entre Serge Daney et Jean-Luc Godard," 1988, Cinémathèque française, 1:59:09, https://www.cinematheque.fr/henri/film/125365-entretien-entre-serge-daney-et-jean-luc-godard-jean-luc-godard-1988/; Jean-Luc Godard, "Sätze über Kino und Geschichte: Rede zum Adorno-Preis," *Cinema* 41 (1995): 113–18, here 116.

(55)
This article was written in connection with my dissertation on the work of Jean-Luc Godard and intersections of research on film, architecture, infrastructure, and urban planning: *Jean-Luc Godard INFRA–STRUCTURE(S) GRAND(S) ENSEMBLE(S) DÉ/MONTAGE(S)* (2021) at the Department of Film Studies of the University of Zurich.

Media and Development
UNESCO and the Issue of Formats

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17′

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In 1979, sociologist and filmmaker Yvonne Mignot-Lefebvre dedicated an issue of *Revue Tiers Monde* to the connections between "audio-visual and development" in which she assessed the "myths and realities" surrounding the project of a "two-way communication" in the 1970s. She portrayed it as a utopia:

> Here we are in 2001: The harm done by one-way centralized television has been largely exposed. [...] People were tired of being passive recipients of top-down information that they could not control, and therefore imposed democracy in the realm of communication by various means. [They] ceased to be mere recipients of programs, however educated, to become creators themselves. They established a system enabling the foundation of a horizontal communication system through the multiplication of broadcasting sites (local and regional TVs and radio stations) where users were represented along with local groups and organizations, and through the subsidizing of programs produced by villages, towns, and regions within a country or across countries, etc.
>
> Groups or individuals can also offer films or programs that they produced themselves at any of the broadcasting sites.
>
> The VHS network can also be used; tapes are then sent to interested parties.
>
> The standard equipment of an isolated African village's center for development includes: one or more large screen TVs working with solar batteries, several video-radio cassette players allowing individual reception, and a full video cassette recorder allowing the autonomous production of programs. Editing tables with professional technical assistance are freely available at community TV stations.
>
> Terminals connected to a computer network via phone lines are also made available to the public, especially for databank mining.
>
> In this way, as is currently the case with the transistor, each social micro-group will have one or several video-radio-cassette players, which will allow people to watch programs from local, regional, national, and foreign televisions, as well as pre-recorded programs.
>
> Mac Luhan's vision of the global village, and UNESCO's dream in the 1970s of a free and balanced information have become a reality! Constantly connected to the rest of

the world, yet firmly rooted in their own culture, masters of their own free expression, men and women self-manage in peace. (1)

Although we certainly need to acknowledge past utopias' failures and contributions, it seems, however, that some contemporary digital cultures dream of being their completion. Indeed, the following characteristics identify pretty closely today's digital media environment: an attraction to a radically decentralized communication at the expense of vertical information structures, easy access to production equipment and to image and sound editing, a lack of differentiation between recipient and creator, between exchanges and criticisms, the ability to let non-professional productions mingle with official programs or along with them, and of course the networking of computers and databanks through telephone lines.

If we get away from the customary approach to film studies that considers the "digital transition" through its real or assumed impact on the evolution of the dominant commercial cinema, we can see pretty clearly that digital technologies may have first of all enabled the possible technical, social, and geographical dissemination of "light" audiovisual productions. Besides aiding in the evolution of filming technology, digital formats have essentially transformed the status quo. The porosity between digital formats has indeed transformed the ways in which works circulate. All of a sudden, and for the first time, the same projectors and screens were capable of broadcasting at once Hollywood or Bombay studios' blockbuster films, as well as low-tech productions with minute budgets.

Consequently, a potential for transformation is tied to the ecology of formats; it depends on the media's technical systems, but also involves great political implications. These implications were immediately understood, which is why these media formats were contemplated within a very strict frame, concerning both their technical realities and their political potentialities. One could say that the frame is in fact paradoxical since we are talking about the United Nations Educational, Scientific and Cultural Organization (UNESCO), namely one of the most important institutions worldwide which, for a period of time, built itself as a support to anti-institutional struggles, a structure helping, from on-high, those struggling from below. When Yvonne Mignot-Lefebvre imagined her "utopia"—writing that "After this brief bright light shone into the future, the return to realities seems brutal" (2)—she was indeed referring to UNESCO as origin of that "dream." However, in 1979, at the time of that publication, one could feel a slowdown of the early enthusiasm: the feeling that, in the end, what might have looked like an exciting possibility was maybe ending in failure. That idea was the use of portable media—that is, substandard formats of traditional technical media, for the "development" of poor countries and the creation of a "new international order of information" (3) desired by the countries then known as non-aligned.

The Shock of Synchronous 16 mm

The emergence of the issue of formats at UNESCO played out in an extremely complex context. On December 19, 1961, the UN adopted a resolution (4) claiming the 1960s as the "United Nations Development Decade" and calling for a "programme for international economic co-operation." This decision was made after the great majority of African countries gained their independence in 1960. Josiane Jouët stated that during that decade "the mass media (press, radio, television) were perceived as privileged vehicles for development, as multipliers of change. Numerous authors at the time pointed out a correlation between mass media and the adoption of individual attitudes of modernity." (5) But in 1970, when the second Development Decade was announced, (6) this strategy had not produced the expected results, and therefore "models of development as well as the centralized and vertical mass media communication system were challenged. [By contrast, the] light media are symbiotic with the new concept of development that rests on the promotion of small units, the preservation of ecosystems, and implementation of appropriate technologies." (7)

In the meantime, another story needs to be told, that of some technicians and movie makers' experiments on recording synchronous sound in conditions of documentary filming with mobile and reactive camera equipment. At the end of the 1950s, in several places (for example, the United States, Canada, France) there was an acceleration of the innovation process through which the equipment and technical procedures named *cinéma-vérité* or *direct cinema* emerged. (8) They relied on the blending of various recent devices such as shoulder-carried, increasingly autonomous 16 mm cameras with silent mechanisms, wireless or multi-directional microphones, zooms, super-sensitive film, quartz synchronization system, and portable batteries with direct current.

It turns out that the first comprehensive conceptualizations of these new techniques, as they were still in their experimental stage, came from UNESCO. The very first one undoubtedly broke with the past in several ways, even if, in hindsight, texts by Jean Rouch and later Luc de Heusch (with a preface by Edgar Morin) in 1961 and 1962 had anticipated them. (9) It was a report entitled "Pour un nouveau cinéma dans les pays en voie de développement: Le groupe synchrone cinématographique léger" (10) authored by Mario Ruspoli for the second roundtable "Cinéma et culture arabes" that took place in Beirut in October 1963 (fig. 1). It is worth noting that Jean Rouch, Georges Sadoul, and Pierre Schaeffer attended as discussants, and that the French delegation was the most important one, except for that of Lebanon, the host country.

Ruspoli felt that what he called "cinéma-direct" (11) constituted a major invention that implied a complete overhaul of practices, a new set of tasks and interactions between technicians, and a reconfiguration of these very tasks. This project was essentially possible thanks to the 16 mm format which was originally meant for non-professionals but had undergone serious improvements since World War Two. From then on, the 16 mm format provided a comprehensive and coherent production system: movies could be made outside of studios, and by smaller teams of just a few people, without the heavy 35 mm equipment, which necessitated large teams trained in the handling of complex devices. Ruspoli considered that the impact of this new system offered much greater possibilities than the mere documentary option to which it was often limited. In his words: "Its applications are universal and *replace purely and simply all those of classical film*, including fiction. Studios welcome it, as do regular people." (12)

(1)
Yvonne Mignot-Lefebvre, "Vers une communication à double sens? Mythes et réalités," *Revue Tiers Monde* 20, no. 79 (July/September 1979): 503–22, here 509–10. (This and all subsequent translations, unless otherwise cited, are by Josiane Peltier.)

(2)
Mignot-Lefebvre, "Vers une communication," 510.

(3)
On this topic, see the summary by Serge Sur, "Vers un nouvel ordre mondial de l'information et de la communication," *Annuaire français de droit international* 27 (1981): 45–64.

(4)
UN, Resolution 1710 (XVI), "United Nations Development Decade: A Programme for International Economic Co-operation (I)," December 19, 1961, UN General Assembly Resolution Tables, https://documents-dds-ny.un.org/doc/RESOLUTION/GEN/NR0/167/63/PDF/NR016763.pdf?OpenElement.

(5)
Josiane Jouët, "Critique de l'utilisation des médias légers dans le *Tiers Monde*," *Revue Tiers Monde* 20, no. 79 (July/September 1979): 549–62, here 549.

(6)
UN, Resolution 2626 (XXV), "International Development Strategy for the Second United Nations Development Decade," October 24, 1970, UN General Assembly Resolution Tables, https://documents-dds-ny.un.org/doc/RESOLUTION/GEN/NR0/348/91/IMG/NR034891.pdf?OpenElement.

(7)
Jouët, "Critique de l'utilisation des médias légers," 549–50.

(8)
On this process, see Caroline Zéau, *L'Office national du film et le cinéma canadien (1939–2003): Eloge de la frugalité* (Brussels: Peter Lang, 2006); Vincent Bouchard, *Pour un cinéma léger et synchrone! Invention d'un dispositif à l'Office national du film à Montréal* (Villeneuve d'Ascq: Presses Universitaires du Septentrion, 2012); Séverine Graff, *Le Cinéma-vérité: Films et controverses* (Rennes: Presses Universitaires de Rennes, 2014); Vincent Sorrel, "L'invention de la caméra Éclair 16: Du direct au synchrone," *1895 Revue de l'association française de recherche sur l'histoire du cinéma*, no. 82 (2017): 106–31, https://doi.org/10.4000/1895.5390.

(9)
See Jean Rouch, "The Cinema in Africa: Present Position and Current Trends," Paris, July 2, 1962 (UNESCO report to the Venice roundtable, September 10–11, 1961; the French version's date of publication is August 23, 1961), https://unesdoc.unesco.org/ark:/48223/pf0000184262_eng; Luc de Heusch, *The Cinema and Social Sciences: A Survey of Ethnographic and Sociological Films*, preface by Edgar Morin, Reports and Papers in the Social Sciences, no. 16 (Paris: UNESCO, 1962).

Thus, Ruspoli brought to UNESCO the idea of an economical and versatile technical structure, opening the way to the emergence of national cinemas, including in countries where the budget of a traditional shoot remained out-of-reach. Moreover, the simplicity of the means involved would enable the training of local technicians through assistant positions, and would not require a heavy pedagogical structure.

UNESCO's interest in the "direct" can be seen in its frequent participation at roundtables during the next few years: "Direct Cinema, Aesthetic of Reality" was written by Louis Marcorelles in 1964 for the Mannheim round table (fig. 2),(13) and "Naissance de la 'Living Camera'" by operator/filmmaker Richard Leacock for Moscow's in 1965 (fig. 3).(14) Additionally, UNESCO published an important study co-written by Marcorelles and Nicole Rouzet-Albagli, entitled *Eléments pour un nouveau cinéma*, in which the longest chapter is dedicated to direct cinema.(15)

8 mm: Media and Education

A new shift occurred in this lineage in 1968; it revived the hopes about direct cinema that were raised in its beginnings by Ruspoli, yet nevertheless displacing them. The collection *Reports and Papers on Mass Communication* published a report by filmmaker and historian Geoffrey Bell entitled *8 mm Film for Adult Audiences* (fig. 4). The title's straightforwardness conceals an important transition: The text accounts for the emergence of a new format, the Super 8, among UNESCO's parameters. Indeed, if Bell takes the 8 mm in all its variants for granted at a time when the Super 8 still coexisted with its competitors, it means that it was the model marketed by Kodak four years earlier that brought about a decisive tipping point.

Bell's report deals with the use of film in the educational structures for adults, what UNESCO calls "basic education" or "informal education"—a concept that already had a long history in the 1960s and was partially promoted by the organization. As the author recalls in the introduction, the inventory of educational films was practically entirely in 16 mm at that time. The distribution network was well established; schools and institutions had access to projectors and would rent films from the large offering of centralized libraries. But Bell noted that this network was not accessible to everyone:

> In developing countries, such a teaching aid is relatively very expensive, the projector cost being comparable with that of, say, a school building or the contents of a public library. [...] Even given the projectors, such countries seldom have funds for making or adapting 16 mm films suited to local education or for distributing them.(16)

Bell formulated here what appeared to be the limit of Ruspoli's initial project: the 16 mm "light cinematographic synchronous group" was inexpensive compared to the standard professional 35 mm shooting equipment, but in fact remained out of reach in some economic circumstances. Or rather it proved to be ill-adapted to a truly decentralized use. The emergence of Super 8 reconfigured the field. The "heavy media" (television, radio, film) that require state support and therefore demand strong political input, or need Western financing, started using 16 mm "lightweight cameras."

(10)
Mario Ruspoli, "Pour un nouveau cinéma dans les pays en voie de développement: Le groupe synchrone cinématographique léger," Paris, October 11, 1963 (UNESCO report to the 2nd Beirut round table, October 28–30, 1963), https://unesdoc.unesco.org/ark:/48223/pf0000185061?posInSet=1&queryId=b01f5fbe-0c1a-49ce-a926-ee837112d944. This report was published in the proceedings of this roundtable, *Cinéma et culture arabes*, vol. 2 (Beirut: Centre interarabe du cinéma et de la télévision, 1965), 113–69.

(11)
See Caroline Zéau, "Mario Ruspoli et *Méthode I*: Le cinéma direct et le bien commun," *Décadrages*, no. 18 (2011): 69–85, https://journals.openedition.org/decadrages/219.

(12)
Ruspoli, "Pour un nouveau cinéma," 30 (underlined in the original report).

(13)
Louis Marcorelles, "Direct Cinema, Aesthetic of Reality," Paris, December 30, 1964 (UNESCO report to the Mannheim round table, October 12, 1964), https://unesdoc.unesco.org/ark:/48223/pf0000001311_eng?posInSet=5&queryId=N-EXPLORE-d848b3f5-f2c7-49a1-85e9-5b3bb4c8f07a.

(14)
Richard Leacock, "Naissance de la 'Living Camera'" and Pierre Cottrell, "Bibliographie analytique du *cinéma-vérité*," Paris, June 30, 1965 (UNESCO report to the Moscow round table, July 13–15, 1965), https://unesdoc.unesco.org/ark:/48223/pf0000143769.

(15)
Louis Marcorelles, in collaboration with Nicole Rouzet-Albagli, *Eléments pour un nouveau cinéma* (Paris: UNESCO, 1970).

(16)
Geoffrey Bell, *8 mm Film for Adult Audiences* (Paris: UNESCO, 1968), 5 [Reports and Papers on Mass Communication, no. 54], https://unesdoc.unesco.org/ark:/48223/pf0000059543. Let us stress the fact that the paradigm here is neither aesthetic nor cinematographic, but one of mass communication.

It turned out that Super 8 had a lot of other advantages. Easy to use, it served the filmmaking public at large, especially instructors and students. Its low cost allowed institutions to buy films and equipment rather than renting them, and even to make movies themselves. Bell underscored these new possibilities, which were tremendously attractive to UNESCO. He also mentioned its downsides. The images' small size required smaller screens, and thus precluded large audiences. As for the sound, it was only good enough when using Super 8 with magnetic tracks, which was more expensive and complex.

Bell's report identified all the available equipment that would work in the educational field, describing the technical and usage specificities for each device, along with their price range. Bell estimated the whole of an "8 mm project" to be $4,000 at the time [about $15,000 today] including blank stock, screens, cameras, projectors, editing tables and so on, in order to produce and show Super 8 films in an educational setting. In an appendix, Bell proposed an interesting "list of audio-visual media" (figs. 5–6) divided into three categories: "low cost" (equipment under $100), "medium cost" (between $100 and 300), and "high cost." The first category includes a chalk board, adhesion boards, wall charts, maps, flip books, spring-motor record player, radio, models, slide/filmstrip projector. The second category includes automatic slide projectors, silent 8 mm and 16 mm projectors, electric record player, tape recorder, overhead projector, episcope. The category of expensive media includes television, sound film projector, stereoscopic slide projector. This list demonstrates to what extent the notion of format was here the organizing factor; media differences were irrelevant.

Over the next few years, this diversity of formats and media would only increase. In 1979, the International Institute for Educational Planning, an arm of UNESCO, published a research report written by agronomist Michel Gutelman entitled *The Use of Modern Media for Rural Education in Developing Countries: The Organisational Problems* (fig. 7).(17) In it he suggests a "functional classification"(18) of media revealing the institution's new concerns: (1) "media requiring central control," such as television and radio; (2) "media requiring partial central control," which comprise "almost all the audio-visual, visual or 'little audio' systems, i.e. sound or silent film projectors, 16 mm, 8 mm, Super-8, automatic and non-automatic slide projectors, mechanically, mains or battery operated record players, certain types of video machines, etc."; (3) "media requiring no central control," essentially "cassette recording and playback devices and, more especially, video tape machines." In this third category, the "message itself can be entirely created on the spot, in some cases by the users themselves."(19) A fourth and last category includes (4) "traditional media," which have in common the fact that they do not require any form of electrical power: newspapers and periodicals, wall posters, maps, three-dimensional models, blackboards, and so on.

Bell's and Gutelman's classifications underscore the intensity of the ongoing thinking about small media, notably coming from UNESCO. These profound theoretical reconfigurations were the results of both technical advances and transformations in institutional policies, the latter being themselves the products of concrete experiments, whether successful or problematic. As mentioned by Earl Rosen and Reg Herman in another UNESCO publication, the program

(17)
Michel Gutelman, *The Use of Modern Media for Rural Education in Developing Countries: The Organisational Problems* (Paris: International Institute for Educational Planning, 1979) [Research report, no. 31], https://unesdoc.unesco.org/ark:/48223/pf0000071984. The IIEP was established by UNESCO following a resolution at its December 1962 General Conference.

(18)
Gutelman, *The Use of Modern Media*, 4–6.

(19)
Gutelman, *The Use of Modern Media*, 6.

1

Distribution limitée PARIS, le 11 octobre 1963

ORGANISATION DES NATIONS UNIES
POUR L'EDUCATION, LA SCIENCE ET LA CULTURE

Pour un nouveau cinéma
dans les pays en voie de développement :

LE GROUPE SYNCHRONE CINEMATOGRAPHIQUE LEGER

par

Mario Ruspoli

Ce rapport représente la contribution de l'Unesco
à la 2e Table ronde de Beyrouth
consacrée au Cinéma et à la Culture arabes
du 28 au 30 octobre 1963

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WS/1063.1 - CUA

fig. 1 Mario Ruspoli, "Pour un nouveau cinéma dans les pays en voie de développement: Le groupe synchrone cinématographique léger," Paris, October 11, 1963 (WS/1063.1/CUA), title page. © UNESCO Digital Library.

2

Distribution: limited Paris, 30 December 1964
Translated from the French

UNITED NATIONS EDUCATIONAL,
SCIENTIFIC AND CULTURAL ORGANIZATION

DIRECT CINEMA, AESTHETIC OF REALITY

R E P O R T

by

Louis Marcorelles

Report contributed by Unesco to the Mannheim round table meeting, sponsored by Unesco, the National Commission for Unesco of the Federal Republic of Germany, and the Mannheim Festival.

Opinions and recommendations in this report are the sole responsibility of the author.

WS/0964.90 (CUA)

fig. 2 Louis Marcorelles, "Direct Cinema, Aesthetic of Reality," Paris, December 30, 1964 (WS/0964.90/CUA), title page. © UNESCO Digital Library.

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par Pierre Cottrell

Le présent rapport, rédigé à la demande de l'Unesco, est une contribution aux travaux de la Table ronde de Moscou (13-15 juillet 1965) organisée par l'Unesco, la Commission nationale soviétique pour l'Unesco et le IVe Festival international du film de Moscou.

Les opinions exprimées dans le présent rapport et les recommandations qui y sont formulées n'engagent que leurs auteurs

CS/0665.19 - CUA/23 (WS)

fig. 3 Richard Leacock, "Naissance de la 'Living Camera'" and Pierre Cottrell, "Bibliographie analytique du *cinéma-vérité*," Paris, June 30, 1965 (CS/0665.19/CUA/23(WS)), title page. © UNESCO Digital Library.

No.54

8 mm film for adult audiences

Reports and Papers on Mass Communication

Unesco

figs. 4-6 Geoffrey Bell, *8 mm Film for Adult Audiences* (Paris: UNESCO, 1968), (COM/MC.68/XVIII.54/A), title page and appendix, 35–36. © UNESCO Digital Library.

APPENDIX I

LIST OF AUDIO-VISUAL MEDIA

This list of the main media comprises three categories, and notes some relatively unfamiliar points. "Low Cost" means roughly less than one hundred dollars. "Medium Cost" means that the equipment, without supporting material, costs something between one hundred and three hundred dollars. "High Cost" means more than three hundred dollars.

The categories are not rigid. High-quality equipment will cost more. Because they may be inexpensive, models are placed under "Low Cost". But the cost of a small set of navigable oil-tanker models and an adapted lake for the training of ocean-going tanker captains near Grenoble, France, is $700,000. This specialized sphere of adult education foresees the use of "self-analysis" films, no doubt in 8 mm for economy's sake.

LOW COST

Chalk Board

The familiar blackboard may be green, or washable white to take colour better, and can serve as a projection screen.

Adhesion Boards

The flannel board uses the fact that thin card with sandpaper backing will stick to cloth. A steel sheet is used to make a magnet board.

Adhesion boards, displayed like a chalk-board, require prepared material, which can be reused. They serve rather as a "dynamic blackboard", with no time lost in writing or deleting. They permit the smooth build-up of a complex pattern in stages, and variants of this.

Wall Charts, Maps, Flip Books

Any material to be "learnt by heart" may be shown by wall charts - road signs in driving instruction, for example. Flip books (that is, poster-size charts bound like a book, allowing the visuals to be presented in series to a group of students) serve much the same purpose as filmstrips or slide sets where electricity is lacking.

Record Player (spring-motor)

The clock-work gramophone is useful in non-electrified areas.

Radio

An important disseminator of material where local teaching resources are limited, especially in multilingual countries for language teaching.

Models

Three-dimensional concepts require models for subjects ranging from mathematics to anatomy, in natural or exaggerated scales. They include student-made cardboard displays, cutaway plastic models, working machinery.

Slide/Filmstrip Projector

Normally requires electricity although kerosine-lamp models do exist.

Slides are generally 36 x 24 mm in picture size, but are sometimes called "two by two", since 2 inches is the outer dimension of the mount. Filmstrip frames, printed on a length of 35 mm gauge film, may be the same, or half this, size.

Filmstrips are cheap, light, and compact. They are accompanied by a written text for the user's guidance.

MEDIUM COST

Automatic Slide Projectors

These involve less distraction since slide-changing

is by push button. They do not accept filmstrips.

Silent 8 mm Film Projector

See main text.

Silent 16 mm Film Projector

Conventional models without automatic threading. The supply of silent 16 mm films is not large in most places.

Electric Record Player, Tape Recorder

Can be used in language and music teaching. Tape recorders are the basic element in language laboratories. Reproduction, especially in the high frequencies, may be critical.

Overhead Projector

A small illuminated "desk" shows large transparencies, to which the teacher can add his own or other drawings. Projection is onto a screen behind him, enabling him to face the class continuously.

Episcope

For projecting opaque material - photographs, book illustrations, drawings. Epidiascopes project slides (diapositives) as well.

HIGH COST

Television

Closed-circuit television conveys uncoloured moving images over cables, or an equivalent system, within a limited area. Open-circuit does the same within range of the transmitting station. Colour television is still expensive for educational use. The many aspects of television are studied, internationally, in "Television Teaching Today" - see Appendix II.

Sound Film Projector

For 8 mm see main text.

Hand threading reel-to-reel (conventional) models in 16 mm are normal, but a cartridge-loading 16 mm projector is marketed in U.S.A.

Stereoscopic Slide Projector

These use polaroid filters and a metallic-surface screen to separate left- and right-eye images, and viewers use polaroid spectacles, to view three-dimensional images in colour. The medium has been put to experimental use for science teaching in Paraguay, using two ordinary slide projectors which can be made to give the same effect. It is then no longer in the "High Cost" range.

Challenge for Change / Société nouvelle deployed by the National Film Board of Canada in 1967 played a pioneer role in several aspects. (20) But other attempts occurred throughout the world: "Tanzania Year 16" in video between 1971 and 1973, the society for agricultural development and dissemination using Super 8 in Senegal, and in Ecuador the collection of sound documents on audio cassettes by local volunteers with the collaboration of the general population by community radio station Radio Tabacundo. In the Ivory Coast alone, the State Society for Agricultural Modernization owned a video van; the National Office for Rural Promotion used slides and Super 8; in 1974 the government implemented a complex system of educational broadcast while, in the Bonoua district, a community-based television was entirely provided by UNESCO starting in 1977, which the institution evaluated in summer 1978. In the first three years of its independence between 1975-1978, the socialist country of Mozambique, under Samora Machel, created the National Film Institute, and used both 35 and 16 mm. It supported the "Super 8 Project" at the University of Maputo, which was set up by Jean Rouch and financed by France's Ministry of Foreign Affairs. It also signed a two-year contract with Jean-Luc Godard in order to devise the creation of a national television using video. Such experiments blossomed. In 1985, in Bolivia, for example, community radios participated in the unionization of miners.

(20) "Challenge for change played an important role in some of the earliest attempts to use cable for community purposes, and it was also a pioneer in the use of small-format media in the context of lifelong education." Earl Rosen and Reg Herman, "The Community Use of Media for Lifelong Learning in Canada," in *Access: Some Western Models of Community Media*, ed. Frances J. Berrigan (Paris: UNESCO, 1977), 85–143, here 88, https://unesdoc.unesco.org/ark:/48223/pf0000024716.

Video: A New System

Sony had launched its Portapak in the late 1960s; accordingly, Gutelman's report gave a glimpse of a new generation of "light" technical equipment: video. Gutelman wrote:

> Since the beginning of the seventies, there has been quite a craze for the use of small "video" for education in rural areas. The reason for this craze is that video, despite a number of drawbacks, is practically the only small medium available today which combines both moving picture and sound. (21)

Able to operate on batteries, and independent of a fixed external institution (laboratory or control room), video is a relatively autonomous medium; moreover, the "audio-visual tape can be played back as soon as it has been recorded or after a fairly simple editing process. Video not only combines in one machine all the advantages of a cassette recording, playback device, and polaroid film, but offers more." (22)

But there is more than meets the eye: "In theory, 'video' is easy to use but, in fact, in the hands of an inexperienced operator, the results may often be unsatisfactory." (23) Color equipment is cumbersome and delicate; editing requires another rather expensive tape recorder; the lack of standardization creates incompatibility problems between video recorders. Besides, "maintenance is fairly complex and more expensive than in the case of film equipment," (24) to which must be added the difficulty of getting spare parts outside of standard Western supply networks. Finally, "battery operation is possible but only for short periods—for prolonged use, one needs either a generator or a mobile van unit." (25)

This is an illustration of a fundamental theoretical underpinning about techniques, as exemplarily argued by Gilbert Simondon. In its industrialized version, a technical object is not an autonomous

(21) Gutelman, *The Use of Modern Media*, 26. UNESCO's English translation omits the end of the last sentence in French "sans inertie technique" [without technical inertia], cf. Michel Gutelman, *L'Utilisation des medias modernes pour l'enseignement en milieu rural dans les pays en voie de développement: Les problems d'organisation* (Paris: UNESCO, 1979), https://unesdoc.unesco.org/ark:/48223/pf0000071984_fre.

(22) Gutelman, *The Use of Modern Media*, 26.

(23) Gutelman, *The Use of Modern Media*, 26.

(24) Gutelman, *The Use of Modern Media*, 27.

(25) Gutelman, *The Use of Modern Media*, 26.

object, in contrast to its artisanal form. It then appears as an aggregate of parts that must be replaceable, and the heart of a network to which it is connected. A car is not autonomous, it is "an element in a technical whole composed of the road network [including all road signs], the gas stations network, the suppliers of spare parts and maintenance network." (26) A technical object can only be conceived as a segment of a network, a network of parts but also of tools and know-how; if these networks are absent the object is useless. A movie camera requires not only a photochemical laboratory and a stock-making plant, but also an effective transportation network guaranteeing their interconnectivity. The bulbs of a projector must be regularly replaced, which implies the availability of parts and the needed technical qualification.

This is the main issue when introducing any technology, and especially media technology, in developing countries. It is not enough to bring in devices—cameras, recorders, video players, turntables, and so on—one must be able to ensure a full technical network allowing their continuous, preferably independent, use. But this technical network is in fact extensive, in scope and complexity, and difficult to master because, at each stage of the process, the differences between Western conditions—those in which the technical object and project have been thought out—and local technical, economic, and geographical conditions play out. Indeed, all these issues are interconnected.

(26) Gilbert Simondon, *Sur la technique* (Paris: Presses Universitaires de France, 2014), 309.

Formats and Infrastructures

In 1978, Benedict and Margaret Tisa produced a report for UNESCO entitled "Planner's Guide to Film and Videotape" (fig. 8).(27) It describes precisely all the technical devices available to film in "light" conditions. It provides selection criteria between various models, and compares costs, as well as the upsides and downsides of each mode depending on types of projects, taking into account all kinds of criteria and constraints. The last pages provide a comparative chart of film and video formats (figs. 9–10). The last three points focus on the impact of humidity, dust, and temperature. These three elements are certainly detrimental to film but can be fatal to video equipment. Humidity can easily be managed with regards to film equipment; it must be contained to 50 percent for video. Dust can scratch film; and cameras have to be cleaned regularly, which is a fairly simple task. But dust may be videotape players' worst enemy; they have to be cleaned before and after each use, even though a full cleaning is difficult. If cared for properly, cameras using film can run within a large temperature scope. But sun exposure can melt some components or burn out the Vidicon tube. All this equipment having been conceived in plush laboratories in Japan, Europe, or the United States, it is easy to imagine how complicated handling such equipment might be in an African setting, notwithstanding chaotic country roads that might turn out to be another problem, as mentioned by Josiane Jouët. (28)

But perhaps the most salient issue showcasing the problem of dependence on a technical network remains access to electricity. In her utopia, Mignot-Lefebvre imagined TV monitors supported with solar batteries. (29) Gutelman created a separate category for media that did not need electricity at reception sites. Besides, he felt that "educational film, perhaps more than any other medium, pose complex problems for developing countries, e.g. the projectors for

(27) Benedict Tisa and Margaret Tisa, "Planner's Guide to Film and Videotape," UNESCO, 1978, https://unesdoc.unesco.org/ark:/48223/pf0000034424?posInSet=2&queryId=a76ae8bc-bfcb-4b09-8f97-cd98555057d1.

(28) Jouët, "Critique de l'utilisation des médias légers," 559.

(29) Mignot-Lefebvre, "Vers une communication," 509.

7

RESEARCH REPORT

(31)

THE USE OF MODERN MEDIA FOR RURAL EDUCATION IN DEVELOPING COUNTRIES - THE ORGANISATIONAL PROBLEMS

M. Gutelman
IIEP Consultant

INTERNATIONAL INSTITUTE FOR EDUCATIONAL PLANNING

fig. 7 Michel Gutelman, *The Use of Modern Media for Rural Education in Developing Countries: The Organisational Problems* (Paris: International Institute for Educational Planning, 1979), title page. © UNESCO Digital Library.

8

original English
1978

PLANNER'S GUIDE TO FILM AND VIDEOTAPE

by Benedict Tisa
assisted by Margaret Tisa

The prices indicated should be increased by 10 % per year

ED-79/WS/50

figs. 8-10 Benedict Tisa and Margaret Tisa, "Planner's Guide to Film and Videotape," UNESCO, 1978 (ED.79/WS/50), title page and matrices comparing film and video formats, 65–66. © UNESCO Digital Library.

9

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MATRICES COMPARING FILM AND VIDEO FORMATS

EFFECTS OF HUMIDITY

SUPER 8 and 16mm FILM	VTR
In cameras humidity causes corrosion of metal parts. Humidity and heat together cause fungus growth on lenses. Many super 8 models are equipped with complex electrical systems which are adversely affected by humidity.	Humidity is very detrimental to the critical tolerances of VTR equipment. Deposits of water can cause shorts, and oxidation of certain metals. Components can change their electrical characteristics as they absorb moisture.
Projectors are subject to electrical failures and corrosion.	
Film is affected by humidity due to its property of absorbing moisture from the surrounding atmosphere. It is best handled at a relative humidity of 40% to 50%. Heat and humidity combined cause fungus growth on film.	Helical scan equipment is particularly prone to humidity problems. Quadruplex units are designed to be inherently less affected by high humidity.
With regular cleaning, maintenance, and some provision for protection against humidity, equipment will give reliable use.	Equipment should be kept at a relative humidity of 50%.

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MATRICES COMPARING FILM AND VIDEO FORMATS

EFFECTS OF DUST

SUPER 8 and 16mm FILM	VTR
Dust in the camera may cause scratches on the film and clog working parts.	Dust may well be the worst enemy of VTR equipment.
A thorough basic cleaning is fairly easily accomplished, except in critical areas of rear-loading super 8 models.	A thorough, break-down cleaning is difficult.
Cameras should be regularly cleaned after every roll of film.	VTR equipment absolutely must be cleaned before and after each use.

EFFECTS OF TEMPERATURE

SUPER 8 and 16mm FILM	VTR
Cameras operate best in moderate temperatures. They should be tropicalized for hot climates, and winterized for use in extremely cold climates. When properly taken care of, cameras can function well in extremes of temperature for which they have been adapted. (Since there are many more plastic components in super 8 cameras, the risk of melting and distortion in direct sunlight is much greater than for 16mm cameras.)	VTR equipment should not be operated in extremes of heat or cold. Overheating must be avoided while the equipment is running. Direct sunlight can melt some of the video camera components, or cause the vidicon tube to burn out.
Film is particularly sensitive to heat. Dye changes may result from prolonged exposure to heat. Proper storage facilities at about 65° are necessary.	While magnetic recording tape can stand relatively high or low temperatures, the most favorable working environment is about 70° F. Frequent temperature changes are more damaging to the tape than a constant extreme temperature.

16 mm, 8 mm or Super-8 require a power supply." (30) This requirement can be mitigated with the use of generators but they considerably weigh the process down. The movie *La Jungle et la charrue*, produced by UNESCO in 1956 in Sri Lanka, (31) demonstrates the complexity of this situation. The soundtrack asserts that "among all the programs [UNESCO's educational activities], film projections are the favorite," but "each showing requires significant work." Three men are needed to load the heavy generator onto the truck that will take it to the projection site—a classroom in this case—along with the projector and the loudspeaker that must be handled carefully because they sometimes need to be transported over bumpy roads for some thirty kilometers. The generator is then set up next to the projector and started with a crank. Immediately following, another much lighter setup was introduced: "fixed films," that is a series of slides arranged in small 35 mm reels. They are "a valuable teaching supplement," most notably because the projector "runs on petrol, with no need of a generator."

"Little media" sometimes have the advantage of needing only minimal sources of energy. Some can be operated with different kinds of batteries, which affords a little more autonomy, especially when they are available through local stores. However, the problem is only displaced. In 1979, Armand Mattelart described Mozambique as "a country where one of the technical obstacles to the extension of the mass communication network is the lack of pencils, markers for wall newspapers, and batteries for transistors." (32)

This issue of electricity, power supply, and batteries has remained central. In a very beautiful 2002 radio article in Zambia, Debra Spitulnik describes the emergence of a true technical culture focused on batteries, this very rare resource, and the optimization of their lifespan:

> For example, old batteries can be minimally recharged by placing them in the sun or on the warm coals of a fire. A long string of nearly exhausted batteries can provide a charge that is strong enough to power a radio for a short time. (33)

As she was working on a technical transfer in Ivory Coast in 1987, Madeleine Akrich also stressed the major issue of electrical connections, interpreting it within the frame of the actor-network theory. She noted that "an individual becomes a citizen only when he or she enters into a relationship with the state." (34) In Western countries, the state is constituted through "a wide range of networks"—civil status, schooling, social security—that ensnare the individual into citizenship. By contrast:

> In countries that have been created more recently, specific networks may come to the aid of a weak or non-existent state. The electricity networks may create and maintain a relationship between an individual and a place. Thus in the Ivory Coast, where only a minority of salaried workers paid income tax, the electricity bill became the means by which local taxes were collected in recently built towns. Here, then, it was the electricity network that fostered a wider definition of the concept of citizenship. (35)

Jonathan Haynes recalled that as late as 2016 problems with electricity were legendary in Nigeria, causing frequent power cuts everywhere including big cities, symbolizing failing national policies. (36)

(30) Gutelman, *The Use of Modern Media*, 16.

(31) *La Jungle et la charrue*, camera work by Malcolm Casper, French commentary by Paul Bordry, produced by A.M.A. Ltd for UNESCO, 1956, 16 mm film, color, without synchronous sound; UNESCO Multimedia Video & Sound Collection, https://www.unesco.org/archives/multimedia/document-3842.

(32) Armand Mattelart, "Mozambique: Communication et transition au socialisme," *Revue Tiers Monde* 20, no. 79 (July–September 1979): 487–502, here 494.

(33) Debra Spitulnik, "Mobile Machines and Fluid Audiences: Rethinking Reception through Zambian Radio Culture," in *Media Worlds: Anthropology on New Terrain*, ed. Faye D. Ginsburg, Lila Abu-Lughod, and Brian Larkin (Berkeley, Los Angeles, and London: University of California Press, 2002), 337–54, here 341.

(34) Madeleine Akrich, "The De-Scription of Technical Objects," [1987] trans. Geoffrey Bowker, in *Shaping Technology / Building Society: Studies in Sociotechnical Change*, ed. Wiebe E. Bijker and John Law (Cambridge, MA and London: MIT Press, 1997), 205–24, here 215.

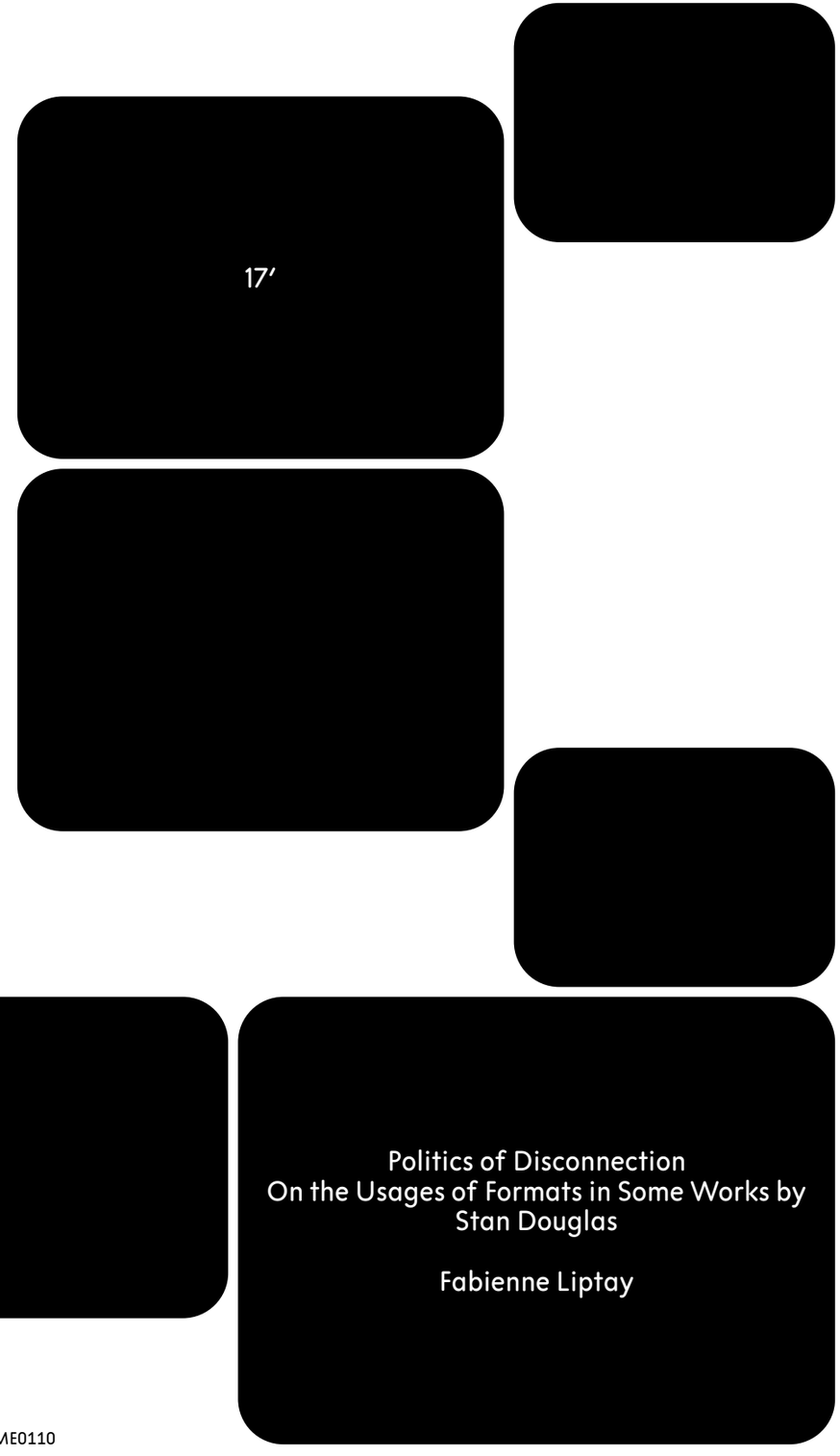
(35) Akrich, "The De-Scription of Technical Objects," 216.

(36) Jonathan Haynes, *Nollywood: The Creation of Nigerian Film Genres* (Chicago and London: University of Chicago Press, 2016), xv.

To confront this situation, people would find informal solutions. They would initiate illegal connections, which would in turn deplete the network. And companies had to set up their own power infrastructures, which hindered their development. It is in this informal DIY environment that Nollywood was born and has developed, notwithstanding the failures of the electrical system.

Conclusion

The two "United Nations Development Decades" have led the way to an important reflection on the social and political potentialities of media formats, following notably Mario Ruspoli's call for a "cinéma-direct." This reflection materialized into numerous experiences and varied "pilot projects" worldwide. In the end, however, the results could be seen as disappointing, with promises always on the horizon but concrete outcomes still elusive. What the electrical question demonstrates is that the problems that slow down the "transplant" of even the least demanding formats in some areas are because of the complex jumble of technical—and socio-cultural—networks, which exist outside of UNESCO's purview. The fact that digital media devices have managed to emerge anyway in some cases and have fulfilled some of the promises that the "light film synchronous group" was not able to, is most likely due to format issues. Indeed, a particular porosity grew across digital media which has created extremely varied modes of circulation, and thus has enabled productions to be seen locally as well as all throughout the largest diasporas.



Politics of Disconnection
On the Usages of Formats in Some Works by Stan Douglas

Fabienne Liptay

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Stan Douglas's *Monodramas* (1991) were conceived as interruptions to the flow of television programing. Inserted into commercial breaks during the night hours on BCTV, the British Columbia television station—as a break within a break so to speak—they lasted thirty to sixty seconds and were broadcast without announcement (fig. 1). They remained disconnected from the program, because they could not be classified as belonging to the category of advertising. In narrative miniatures, the videos show inconsequential moments, moments of misrecognition and malfunction in everyday situations. People fail to connect with each other, driving, walking, talking past each other. A man greets another man on the street as if he knows him, "Hi, Gary!" And, when passing by, he habitually adds, "How are you doing?" The other man replies, "I'm not Gary." Then the video ends.

Erwin Panofsky considered the greeting between men as a prime example of the cultural-historical frames in which this gesture becomes intelligible. Lifting a hat to greet someone as "a residue of medieval chivalry" is "peculiar to the western world," and therefore not understandable for "an Australian bushman" who is unfamiliar with this habit. (1) To the Western observer, however, lifting a hat conveys manifold meanings, revealing that the acquaintance is "a man of the twentieth century" conditioned "by his national, social and educational background, by the previous history of his life and by his present surroundings." (2) The greeting, thus, also figures as a mutual understanding of belonging to a specific cultural and social community, and at the same time as a separation from others who, as the "Australian bushman," are excluded from it. Where the greeting, as in Stan Douglas's *Monodrama*, is not returned, it is precisely this shared horizon of social experience and belonging that is called into question. What seems significant here is that the man greeted is of color, his unanswering a rejection of being habitually misrecognized within a social order of domination.

Panofsky conceived iconology as an elaborate method of interpretation through which a plain gesture such as lifting a hat takes on rich symbolic values that "reveal the basic attitude of a nation, a period, a class, a religious or philosophical persuasion." (3) Bourdieu, who in his afterword to Panofsky's study on *Gothic Architecture and Scholasticism* had engaged with the notion of habitus expressed in common thought and practice, (4) aligned such a gesture with acts of submission to symbolic violence. By, let's say, lifting a hat, one does not only form an idea but submits to a "tacit and practical belief made

(1)
Erwin Panofsky, "Introductory," in *Studies in Iconology: Humanistic Themes in the Art of the Renaissance* (Boulder, CO and Oxford: Westview Press, [1939] 1972), 3–17, here 4.

(2)
Panofsky, "Introductory," 4.

(3)
Panofsky, "Introductory," 7.

(4)
See Pierre Bourdieu, "Postface," to Erwin Panofsky, *Architecture gothique et pensée scolastique*, trans. Pierre Bourdieu (Paris: Les Éditions de Minuit, 1967), 133–67. On "habitus," see Pierre Bourdieu, *Habitus and Field*, General Sociology, vol. 2: *Lectures at the Collège de France, 1982–83*, trans. Peter Collier (Cambridge and Medford, MA: Polity Press, 2020).

possible by the habituation which arises from the training of the body." (5) In this context, Bourdieu only briefly introduces the notion of "countertraining," a repeated bodily exercise in order to transform habitus. (6) However, as the history of photography and film has shown, acts of symbolic violence, of social inclusion and exclusion not only occur in bodily expressions and their pictorial representations, but also in the infrastructures of picture making, where they remain inaccessible to even the most trained eye. Much has been written about the technological racism of color photography and the photochemical privileging of white skin, for which Kodak's Shirley posed on the test cards for calibrating cameras and printers. (7) This white standard was also inscribed in the history of color television. Regarding the North American color system NTSC, Jonathan Sterne and Dylan Mulvin note that this format was not only based on a set of assumptions about human perception borrowed from 19th-century psychophysics, but that it also corresponded with the ideological design of a televisual norm culture. (8) Unlike Kodachrome, NTSC was equally unsatisfactory at reproducing light and dark skin tones, earning it a reputation as an acronym for "No True Skin Color," (9) but it was no less concerned with establishing whiteness as the norm. The color slides that Eastman Kodak provided for the technical tests of NTSC, were "remarkable for their depictions of idealized middle-class life and whiteness in the 1950s: a young woman holding a kitten; another smiling from behind a net; boys canoeing and playing tug-of-war; potted flowers with a dark background. Their subjects evidence the connection between the technical ambitions behind advances in televisual representation and what Michael Schudson would later call the "'capitalist realism' of advertising." (10) Ideas of a cultural and social norm informed the development of technical standards for color television that determined what was represented and what was misrepresented before any program content. Thereby, the process of technical standardization and perceptual engineering already prefigured the future television program and its viewers, envisioning the commercial leisure culture of a white society that would feature in the commercial breaks.

The habitualized forms of communication, which the *Monodramas* stage, thus correspond with the technical standards of formats that regulate the understanding of the television program's content. (11) Douglas's *Monodramas* aim to disrupt these correspondences, to the extent that Madeleine Akrich has spoken of the "description" of social relations shaped by technology. Like a "script" or a "scenario," she notes, certain ideas about the world—"specific tastes, competences, motives, aspirations, political prejudices and the rest" (12)—are inscribed in technical objects and their usage, by which they "measure behavior, place it in a hierarchy, control it, express the fact of submission, and distribute causal stories and sanctions." (13) Where these scripts are disregarded or disputed, new ways of using technologies, of building social relations and generating knowledge may emerge. The notion of "de-scription" is particularly helpful to broaden an understanding of habits to include the usages of media technologies, be it in compliance with or against the grains of their protocols. Technical standards and formats, such as the thousands overseen by the International Organization of Standards (ISO) and deployed for the transmission and compression of

(5)
Pierre Bourdieu, *Pascalian Meditations*, trans. Richard Nice (Cambridge and Medford, MA: Polity Press, 2000), 172.

(6)
Bourdieu, *Pascalian Meditations*, 172.

(7)
For further discussion on this topic, see Lorna Roth, "Looking at Shirley, the Ultimate Norm: Colour Balance, Image Technologies, and Cognitive Equity," *Canadian Journal of Communication* 34, no. 1 (2009): 111–36; Tanya Sheehan, "Color Matters: Rethinking Photography and Race," in *The Colors of Photography*, ed. Bettina Gockel (Berlin and Boston: De Gruyter, 2020), 55–71.

(8)
Jonathan Sterne and Dylan Mulvin, "The Low Acuity for Blue: Perceptual Technics and American Color Television," *Journal of Visual Culture* 13, no. 2 (2014): 118–38, here 126–7, https://doi.org/10.1177/1470412914529.

(9)
See, e.g., Susan Murray, "Never Twice the Same Colour: Standardizing, Calibrating and Harmonizing NTSC Colour Television in the Early 1950s," *Screen* 56, no. 4 (Winter 2015): 415–35, here 421.

(10)
Sterne and Mulvin, "The Low Acuity for Blue," 127. For a more detailed discussion of the test images, see Dylan Mulvin and Jonathan Sterne, "Scenes from an Imaginary Country: Test Images and the American Color Television Standard," *Television & New Media* 17, no. 1 (2016): 21–43. For the reference to Michael Schudson see the chapter "Advertising as Capitalist Realism," in *Advertising, the Uneasy Persuasion: Its Dubious Impact on American Society* (New York: Basic Books, 1984), 209–33.

(11)
Similarly, Benoît Turquety has claimed that "formats in fact constitute a rather rigid geopolitical structure that connects perceptual aspects with a complex system of global media currents and cultural hierarchies." Benoît Turquety, *Medium, Format, Configuration: The Displacements of Film* (Lüneburg: meson press, 2019), 23.

information, figure prominently here; as Keller Easterling has put it in his study on infrastructure, they are particularly successful "in shaping global habits" through the "rehearsal of protocols that join the bargains and offsets of contemporary global governance." (14)

Aired on television, Douglas's *Monodramas* operate within the institutional infrastructure of broadcasting. For this purpose, Douglas did not intend to show them in art's sanctuary space of the galleries that he considered only useful because they gave his artistic project institutional legitimacy: "I use the galleries mostly for the convenience of having access to the letterhead, which makes getting access to the airwaves much easier; institutions like talking to other institutions. But I'm interested in the reaction of people who don't specifically set out to see them." (15) However, neither are these institutional infrastructures as such made visible, nor are their modes of operation revealed with the gesture of critical distancing. Illuminating in this context is a conversation between Cory Arcangel and Dara Birnbaum, published in *Artforum*, about the critical practices of their respective generations of artists. (16) While Dara Birnbaum claims for her works to make visible the "hidden agenda" (17) of what is really said on television, Cory Arcangel rejects this claim for his works. Instead, he is concerned with producing "incredibly elaborate demonstrations of technology" (18) that are indistinguishable in their aesthetic result from all the other images circulating in the data stream of the Internet. Tim Griffin, who refers to this conversation in an essay for *October*, derives from it an understanding of compression as an artistic process *after* criticism. (19) Under the conditions of compression, art can no longer refer to a standpoint outside of those structures from which a critique of them can be articulated. Rather, it is dependent on these structures themselves, embedded in them to the point of indistinguishability. Yet it is precisely this indistinguishability that enables art to simultaneously operate invisibly within the structures and interrupt them:

> By definition, it [compression] is an operation that hides itself in the open; and the would-be critic easily takes the image at hand at face value, discussing it for how it appears, rather than considering the mechanisms inscribed within it—or, as significantly, the sensibility with which it is employed. And, as we can see, the compression model may be deployed for numerous and divergent ends. Such elusiveness in means is perhaps the predominant character of artistic discourse and production today. (20)

It is this sense of a discrete operating in communication infrastructures that Douglas's works are interested in moments of breakdown. (21) The televised *Monodramas* share this interest with more recent digital works by Stan Douglas. The *DCT* series (2016–) is comprised of large-scale paintings: square panels primed with gesso and printed with UV ink that display abstract color fields (figs. 2–3). Brightly colored as well as black-and-white schemes blend into visually unstable patterns. Geometric forms seemingly dissolve into one another, alternately stepping forward and backward, rearranging themselves kaleidoscopically. Blurs make these patterns appear amorphous and undefined, as if our optical perceptual apparatus were creating this effect in a failure of accommodation. Stan Douglas has described his series as an exploration of the "non-identity" (22) of

(12)
Madeleine Akrich, "The De-Scription of Technical Objects," in *Shaping Technology / Building Society: Studies in Sociotechnical Change*, ed. Wiebe E. Bijker and John Law (Cambridge, MA and London: MIT Press, 1997), 206–24, here 208.

(13)
Akrich, "The De-Scription of Technical Objects," 216.

(14)
Keller Easterling, *Extrastatecraft: The Power of Infrastructure* (New York: Verso, 2014), 18.

(15)
Stan Douglas in Chris Dafoe, "Visual non sequiturs intrude in the mindlessness of TV," *The Globe and Mail*, January 30, 1992 cited in Noam M. Elcott, "In Search of Lost Space: Stan Douglas's Archaeology of Cinematic Darkness," *October* 139 (Winter 2012): 151–82, here 166.

(16)
Cory Arcangel and Dara Birnbaum in conversation, "Do It 2," *Artforum* 47, no. 7 (March 2009): 190–99.

(17)
Arcangel and Birnbaum, "Do It 2," 193.

(18)
Arcangel and Birnbaum, "Do It 2," 194.

(19)
Tim Griffin, "Compression," *October* 135 (Winter 2011): 3–20, here 18.

(20)
Griffin, "Compression," 20. In a similar vein, Hito Steyerl has spoken about the ambivalence of poor images: "The circulation of poor images feeds into both capitalist media assembly lines and alternative audiovisual economies. In addition to a lot of confusion and stupefaction, it also possibly creates disruptive movements of thought and affect." Hito Steyerl, "In Defense of the Poor Image," in *The Wretched of the Screen* (Berlin: Sternberg Press, 2012), 31–45, here 43.

fig. 1 Stan Douglas, *Monodramas (I'm not Gary)*, 1991, 10 videos for broadcast television, color, sound, 30–60 sec each. Courtesy of the artist, Victoria Miro, London, and David Zwirner, New York, London. © Stan Douglas.

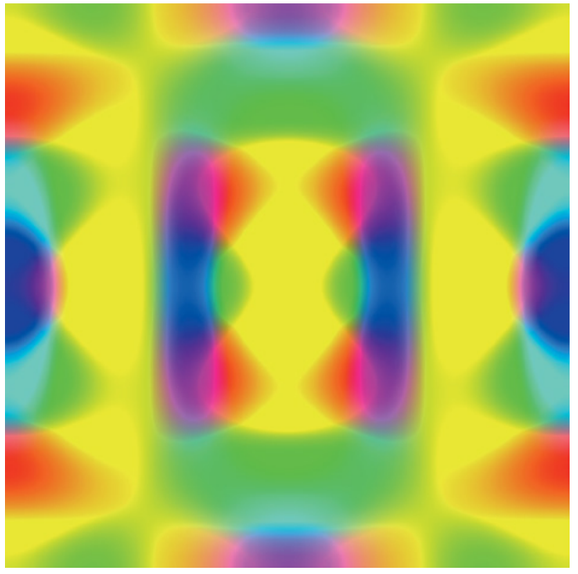
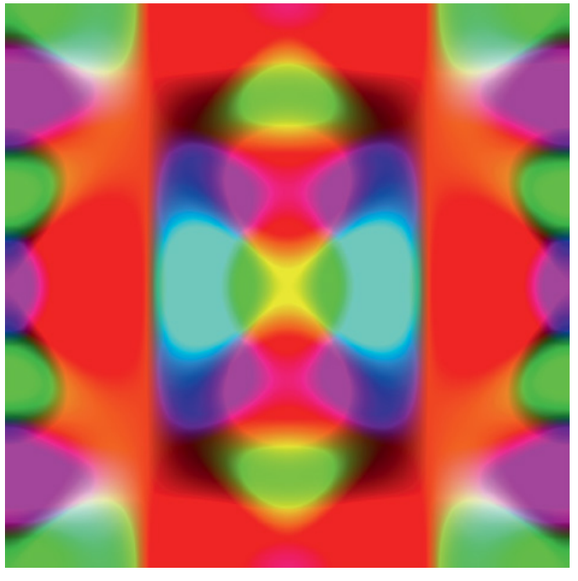


fig. 2 Stan Douglas, *DCTs (RGBDCT07_2662)*, 2016, lacquered UV ink on gessoed panel, 100 × 100 × 5 cm. Courtesy of the artist, Victoria Miro, London, and David Zwirner, New York, London. © Stan Douglas.

fig. 3 Stan Douglas, *DCTs (RGBDCT06_2662)*, 2016, lacquered UV ink on gessoed panel, 100 × 100 × 5 cm. Courtesy of the artist, Victoria Miro, London, and David Zwirner, New York, London. © Stan Douglas.



images (resonating with the statement "I'm not Gary"). Their indeterminacy stems not least from the fact that they are photographs appearing as paintings, or paintings appearing as digital screens, and thus cannot be clearly assigned to any medium.

The digital pictures apparently relate to the history of camera-less photography, to the photogram that has been created by placing objects directly on the light-sensitive surface of film, insofar as they too are generated without a camera, on the basis of a code. In this respect, they align with the historical avant-garde, which sought to liberate photography from its purely depictive function. László Moholy-Nagy, among others, speculated prominently on the possibilities, yet to be explored, of using apparatuses that had hitherto only served as reproduction for productive purposes. (23) He considered the process of camera-less photography, the optical sound on the film reel, and the groove-script of the phonograph to be leading the way for the creation of new optical and acoustic phenomena that are entirely independent of any preexisting reality. Stan Douglas's "reverse engineering" (24) of digital photography, in which it is not an image that is converted into a code, but a code into an image, corresponds to such an experimental "revaluation" (25) of artistic media.

However, the directly encoded image, in which the promise of the abolition of likeness seems to be redeemed, can no longer be understood on the historical grounds of the avant-garde. In contemporary practices of the circulation and distribution of image data it is almost ubiquitous, and thus belongs to a post-representational image regime in which the abolition of likeness has long since become the technological standard. In this sense, Stan Douglas has described his series as an attempt to disrupt the processes that underlie all digital images. (26) The discrete cosine transform (DCT), from which the series of works borrows its title, refers to a process that is mainly used for the lossy compression of image and video data, as in the case of the JPEG image format on which Stan Douglas's series is based. (27)

The term JPEG is an abbreviation for the Joint Photographic Experts Group, which developed this compression method and defined it as an ISO/IEC standard. Lossy compression ensures the highest possible visual quality at a comparatively low data transmission or bit rate. To achieve this, it takes advantage of the physiological findings on the human eye's inability to perceive fine gradations in colors, since these are less noticeable than differences in brightness. Belonging to numerical mathematics makes an understanding of the discrete cosine transform extremely complex, although its use is common and widespread. Streaming a series on Netflix, receiving HDTV television broadcasts, or watching a film on Blu-ray would be unthinkable without the discrete cosine transform as the industry's most common standard in signal processing. During compression, particularly the higher-frequency components to which the eye is less sensitive are neglected, without this being perceived as a loss of quality. In the transmission of moving images, compression also includes the dismissal of similar image information, so that in the case of image sequences, only the differences between the images are transmitted. By default, an image is broken down into eight by eight blocks of pixels interpreted as pixel values to which the discrete cosine transform is applied, creating coefficients that are then quantized and compressed, and finally reconstructed through

(21)
"My work is looking at where things break down, and in that moment of breakdown what choices we make." Stan Douglas in an interview with William S. Smith, "In the Studio: Stan Douglas," *Art in America*, April 1, 2018, https://www.artnews.com/art-in-america/features/studio-stan-douglas-63499/.

(22)
Stan Douglas quoted in Ilana Jael, "Art Out: Stan Douglas: DCTs and Scenes from the Blackout," *Musée*, April 12, 2018, https://museemagazine.com/culture/2018/4/11/art-out-stan-douglas-dct-and-blackout.

(23)
László Moholy-Nagy, "Production – Reproduction (1922)," in *Moholy-Nagy*, ed. Krisztina Passuth (New York: Thames and Hudson, 1985), 289–90. See also László Moholy-Nagy, "New Form in Music: Potentialities of the Phonograph (1923)," in Passuth, *Moholy-Nagy*, 291–92; László Moholy-Nagy, "Problems of the Modern Film (1930)," in Passuth, *Moholy-Nagy*, 311–15.

(24)
Douglas in Smith, "In the Studio."

(25)
Moholy-Nagy, "Production – Reproduction," 290.

(26)
"I'm manipulating the kinds of harmonic interactions that essentially undergird all digital images." Douglas in Smith, "In the Studio."

(27)
William B. Pennebaker and Joan L. Mitchell, *JPEG Still Image Data Compression Standard* (New York: Springer, 1992).

decompression in an inverse process. The lost information that is not recovered from the compressed data in the output image is assigned to so-called irrelevance reduction, that is declared dispensable as measured against the model of human perception on which it is based. (28) For the *DCT*s, Stan Douglas used the mathematical formula of the discrete cosine transform to program images directly, manipulating the amplitudes and frequencies of the individual coefficients until complex image patterns emerged from them. (29)

The *DCT*s appear as a further development of those aesthetically controlled products of photographic accidents that Douglas grouped together under the title *Corrupt Files* (2013) (figs. 4–5). What seems to be a series of abstract images composed from vertical color stripes are in fact digital data patterns that resulted from a coding error on the memory card of the camera he was using. The moment of breakdown is linked to a technical malfunction: glitches during the photographic process that resulted from overheating because of camera overuse. In showing the abstractions that "emerge through the process of compressing representational images for reproduction," (30) the images display their very technical conditions. It seems significant that the "corrupt files" were made first accidentally and then willfully during the work on *Disco Angola* (2012), a photographic series that came from long-term research into the post-revolutionary phase following the Carnation Revolution in Portugal and its African colonies. Here, ruptures of the technical processes and protocols of digital photography, their visibility "upon breakdown," (31) corresponds with the ruptures of historical continuities in the context of the Carnation Revolution and the struggles for decolonization that followed it. *Disco Angola* stages scenes of civil war in Angola and scenes of disco culture in New York, each in four large-scale photographs, framed by the fictional authorship of a photojournalist who travels between these locations with his camera. Historical events are conceived together with media events as local and sometimes aleatory interruptions of a smooth functioning or operation of established order. With Susan Leigh Star and Geoffrey C. Bowker, one could understand the relation between the photographic series *Disco Angola* and the *Corrupt Files* as an "infrastructural inversion," a change of perspective that makes visible "the depth of interdependence of technical networks and standards, on the one hand, and the real work of politics and knowledge production on the other." (32) The surfacing of discrete protocols of technical operation thereby obtains "causal prominence in many areas usually attributed to heroic actors, social movements, or cultural mores." (33)

Stan Douglas has repeatedly associated moments of political upheaval, unrest, and revolution with ruptures in media infrastructures of communication and their habitual use. In doing so, he also refers to the importance of these infrastructures regarding the establishment and stabilization of political power relations, making them at the same time the Achilles' heel of these relations. In the video installation *The Secret Agent* (2015), which once again looks at the post-revolutionary phase after the Carnation Revolution, it is the transatlantic telephone cable that becomes the object of such "infrastructural inversion." In this work, which is based on Joseph Conrad's 1907 spy novel of the same name, Douglas moves the action from Victorian London to Lisbon in the "hot summer" of 1975: a transitional

(28)
In a mathematically proficient explanation of the discrete cosine transform, Cory Arcangel demonstrates the effects of lossy image compression. See Cory Arcangel, "On Compression," in *A Couple Thousand Short Films about Glenn Gould* (London: Film and Video Umbrella, 2008), 220–32. For a helpful introduction, see Adrian Mackenzie, "Codecs," in *Software Studies: A Lexicon*, ed. Matthew Fuller (Cambridge, MA and London: MIT Press, 2008), 48–54. On the history of compression, see, e.g., Jonathan Sterne, "Compression: A Loose History," in *Signal Traffic: Critical Studies of Media Infrastructures*, ed. Lisa Parks and Nicole Starosielski (Urbana and Springfield: University of Illinois Press, 2015), 31–52.

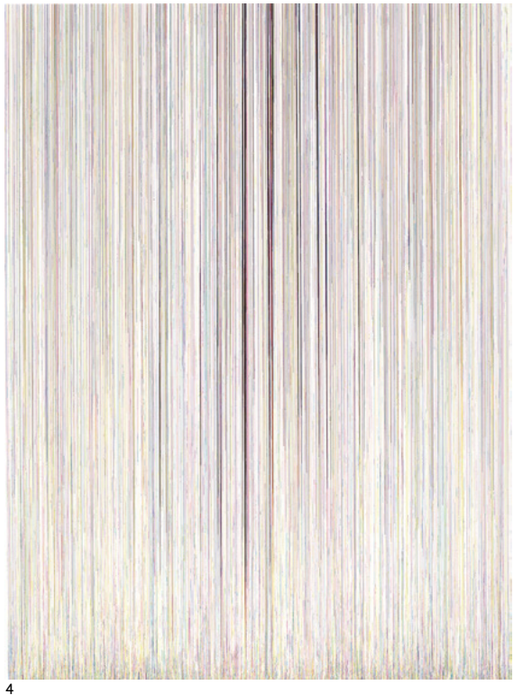
(29)
See Stan Douglas's artist talk on the occasion of receiving the Hasselblad Award 2016 in Gothenburg, Sweden, October 18, 2016, Hasselblad Foundation, 59:00–1:03:50, https://www.youtube.com/watch?v=EqxQx-g4ORp4. See also the catalog, *Stan Douglas: Hasselblad Award 2016* (London and Stockholm: MACK and Hasselblad Foundation, 2016).

(30)
The Polygon, "Stan Douglas: Synthetic Pictures," March 2014, https://thepolygon.ca/exhibition/stan-douglas-synthetic-pictures/.

(31)
Geoffrey C. Bowker and Susan Leigh Star, *Sorting Things Out: Classification and Its Consequences* (Cambridge, MA and London: MIT Press, 1999), 35. According to Bowker and Star, infrastructure is defined by invisibility and, thus, only "becomes visible upon breakdown."

(32)
As stated by Susan Leigh Star and Geoffrey C. Bowker, infrastructural inversion "means learning to look closely at technologies and arrangements that, by design and habit, tend to fade into the woodwork (sometimes literally!)." Bowker and Star, *Sorting Things Out*, 34.

(33)
Bowker and Star, *Sorting Things Out*, 34.



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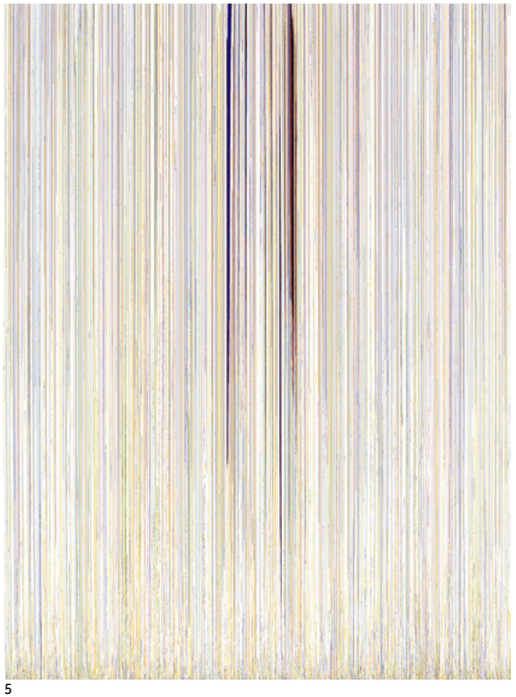

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fig. 4 Stan Douglas, *Corrupt Files (2010_2329)*, 2013, inkjet prints mounted on Dibond aluminum, 200 × 156.2 cm. Courtesy of the artist, Victoria Miro, London, and David Zwirner, New York, London. © Stan Douglas.

fig. 5 Stan Douglas, *Corrupt Files (2010_3024)*, 2013, inkjet prints mounted on Dibond aluminum, 200 × 156.2 cm. Courtesy of the artist, Victoria Miro, London, and David Zwirner, New York, London. © Stan Douglas.

period marked by political unrest following the Carnation Revolution of April 25, 1974, which overthrew the authoritarian dictatorship in Portugal and ended its colonial rule. The revolutionary process, accompanied by socialist aspirations of nationalization and agrarian reform, ended on November 25, 1975 with the defeat of an attempted coup in favor of a communist state, which paved the way for the transition to a democracy with a capitalist economic order. Douglas sets the action in an atmosphere of secret politics and open violence between radical Right and Left groups in the struggle for the country's future. In this fictional staging of historical upheaval, disconnectivity—as I use the term here (34)—refers to an aesthetic operation to open up new possibilities unrealized in history: "not to redeem these past events but to reconsider them: to understand why these utopian moments did not fulfil themselves, what larger forces kept a local moment a minor moment: and what was valuable there—what might still be useful today." (35)

Inspired by the unsuccessful bombing of London's Greenwich Observatory by a French anarchist on February 15, 1894, Conrad devised a fictional plot in which the assassination is directed at the geopolitical center of the world at that time in the prime meridian. In Stan Douglas's work, the observatory at Greenwich is replaced by the transatlantic cable, "that braid of copper under the Atlantic," (36) which had connected Portugal, as a peripheral country within industrialized Europe in the 19th century, to the telegraphic "umbilical cord between Europe and the New World." (37) Owing to the geographical location of Portugal and its African colonies, it represented an important node within the telegraphic network, in which Lisbon, Cape Verde, and the Azores formed the so-called Atlantic strategic triangle. Portugal was not only subject to the imperialist interests that guided this project but was itself able to assert its position as a colonial power within Europe, not least by using the telegraph network to politically and administratively control its colonies. (38) Here, in *The Secret Agent*, the assault on the undersea cable as media infrastructure surfaces on the level of the plot, (39) where it constitutes the central blank space of the narrative. The premature explosion of the bomb that claims an innocent and senseless victim is not shown; it remains blackened out, haunting the separated and multiple offscreen spaces of the six-channel installation.

The history of the technical infrastructures of communication, through which control and power could be exercised over great distances, is closely linked to the history of imperialism and colonialism. In this context, James Beniger coined the term "control revolution" regarding the late 19th century, to which the transatlantic cable as well as the inventions of telegraphy and the telephone, the typewriter, photography, cinematography and, in the 20th century, radio and television owe their existence. (40) These technical infrastructures thus also established a practice of domination that subordinated local and indigenous forms of knowledge and modes of communication to the principles of industrial standardization and structured social practices of communication along the lines of commodity circulation. As historical fiction, borne from meticulous archival research, the failed assault on the transatlantic cable in *The Secret Agent* points to the potentialities of disrupting power relations that constitute the long history of colonialism. (41) In Stan Douglas's

(34)
I have benefited immensely from the discussions during my research fellowship at the Käte Hamburger Research Center "Dis:connectivity in Processes of Globalisation" (global dis:connect) in Munich, where a version of this paper was presented in June 2022. I thank my colleagues, including Christopher Balme, Burcu Dogramaci, Sumathi Ramaswamy, Martin Rempe, Sujit Sivasundaram, Sabine Sörgel, Roland Wenzlhuemer, and Callie Wilkinson for valuable insights.

(35)
Stan Douglas in an interview with Lynne Cooke, "Broadcast Views," *Frieze*, no. 12 (September 1993): 41–45, here 41.

(36)
Quoted from the script for *The Secret Agent* in Stan Douglas, *The Secret Agent*, exh. cat., Wiels Centre d'Art Contemporain, Brussels (Brussels: Ludion, 2015), 81–110, here 86.

(37)
Douglas, *The Secret Agent*, 86.

(38)
See Ana Paula Silva, "Portugal and the Building of Atlantic Telegraph Networks," *Journal of History of Science and Technology* 2 (Fall 2008): 191–212, here 210–11, http://johost.eu/vol2_fall_2008/vol2_as.htm.

(39)
According to Nicole Starosielski, undersea cables have only rarely been investigated as media infrastructures, in which the "everyday politics and practices of media distribution" are entangled in the histories of colonialism and global capitalism. Nicole Starosielski, "Fixed Flow: Undersea Cables as Media Infrastructures," in *Signal Traffic: Critical Studies of Media Infrastrutures*, ed. Lisa Parks and Nicole Starosielski (Urbana and Springfield: University of Illinois Press, 2015), 53–70, here 54.

work, the susceptibility of technical infrastructures to failure and breakage is precisely linked to an engagement with this history, through an interference from which other possibilities of cooperation and exchange can emerge.

Following Jacques Attali's idea that music "constitutes the audible waveband of the vibrations and signs that make up society" (42) and can thus act as the herald of social change, Douglas repeatedly seeks such potential in musical practices of remixing, sampling, and the fusion of historical styles. This is the subject of *Luanda-Kinshasa* (2013), a work that, along with *Disco Angola* and *The Secret Agent*, forms a trilogy (43) and features a fictional live recording of an improvised jam session at the legendary Columbia Records studio in New York, in a seemingly endless six-hour (361-minute) video loop. The video is a performance of what could have been Miles Davis's next recording after his then maligned 1972 studio album *On the Corner*, had he continued his exploration of jazz fusion with other popular music genres from African-American origin to include Afrobeat, which was then emerging in the New York underground disco scene. And it is the subject of *ISDN* (2022), which stages an equally fictional music session.

On two large screens facing each other, two pairs of rappers—one in London, the other in Cairo—are engaging in a musical dialog of call-and-response, bridging the distance between their remote studios via ISDN telephone connection (figs. 6–7). Their performance is reminiscent of the popular practice of "rap battles" in which MCs and their producers would compete to prove their skills, their sessions often recorded on the spot in different locations or released online simultaneously. Featuring TrueMendous and Lady Sanity from Britain and Raptor and Yousef Joker from Egypt, the installation creates a dialog between the musical genres of Grime (with its British African-Caribbean influence) and Mahraganat (with its roots in popular Egyptian Shaabi music) that emerged independently around the same time from the underground of their distinct communities and borne from the social discontent and revolt, which spurred the global upheavals of 2011; the year also mapped in Douglas's photo series *2011 ≠ 1848* (2021) that was commissioned for the Canadian Pavilion at the 2022 Venice Biennale and to which ISDN was conceived in correspondence. (44) Both Grime and Mahraganat have been distributed unofficially before receiving mainstream media attention and produced with accessible technology, making use of FruityLoops, later called FL Studio, a low-cost, easy-to-use and often pirated software for the creation of electronic music. The software facilitated the sharing of knowledge, not only about the making of music but about the social experience expressed through its practice, which is why it "found itself at the core of the conversation across the development of multiple genres and styles all across the world." (45)

What seems like a recorded live session is actually a fictional scenario, meticulously staged in the studio and musically arranged by an algorithm. ISDN (Integrated Services Digital Network), from which the work borrows its title, was introduced as a now superseded international communication standard for the simultaneous digital transmission of voice and video over the public telephone network. Here, however, it is not the actual technology on which the performers' exchange is based but a name for what Erika Balsom,

(40)
James R. Beniger, *The Control Revolution: Technological and Economic Origins of the Information Society* (Cambridge, MA and London: Harvard University Press, 1986), 7. On the history of the telegraph, see especially Roland Wenzlhuemer, *Connecting the Nineteenth-Century World: The Telegraph and Globalization* (New York: Cambridge University Press, 2013).

(41)
The attack is aimed at the cable station of the Portuguese company Rádio Marconi (CPRM) in Sesimbra, Portugal. Two submarine cables were connected to each other at this junction in 1969, linking Sesimbra with Melkbosstrand, South Africa and Goonhilly in Cornwall.

(42)
Jacques Attali, *Noise: The Political Economy of Music*, trans. Brian Massumi (Minneapolis and London: University of Minnesota Press, [1977] 1985), 4. See also Steve Goodman, "1977: A Sense of the Future," in *Sonic Warfare: Sound, Affect, and the Ecology of Fear* (Cambridge, MA and London: MIT Press, 2010), 49–53.

(43)
See Pedro Lapa, *History and Interregnum: Three Works by Stan Douglas* (Berlin and Lisbon: Archive Books and Museu Coleção Berardo, 2015).

(44)
Stan Douglas, *Tunis, 23 January 2011*, 2021; *Vancouver, 15 June 2011*, 2021; *London, 9 August 2011 (Pembury Estate)*, 2017; *New York City, 10 October 2011*, 2021; chromogenic prints on Dibond, from the series *2011 ≠ 1848*, 2021. The four large-scale photographs restage scenes from the Arab Spring in Tunis, the Occupy protests on Brooklyn Bridge in New York, the Hackney riots in London as well as the Stanley Cup riot in Vancouver.

(45)
Declan McGlynn, "How FL Studio Changed Electronic Music Forever," *DJ Mag*, April 20, 2020, https://djmag.com/longreads/how-fl-studio-changed-electronic-music-forever.


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figs. 6–7 Stan Douglas, *ISDN*, 2022, two-channel video installation, color, sound. Courtesy of the artist, Victoria Miro, London and Venice, and David Zwirner, New York, London, Paris, and Hong Kong. © Stan Douglas.

in an essay on the work, has called the "generative fiction" (46) of connecting distant sites on the globe. This connection, figuring as ISDN, is thus not technically given but operates in the realm of the potential. If the *Corrupt Files* and *DCT*s were based on the "infrastructural inversion" of making visible the scripts by which media discretely operate, then here, we have a case of the fictional circumvention of these processes that overwrites these scripts. In fact, the lyrics and the bass line running at 140 bpm (which is the default tempo on FL) (47) were recorded separately, arranged by an algorithm into the permutations of a constantly changing sound pattern that would take more than two weeks to be experienced in full circle. (48) At the end of each loop, the camera rises to reveal the studios' respective locations, opening the view on the vast nocturnal cityscapes of London and Cairo before a new loop, a new sequential iteration or permutation begins with the pressing of the button on the audio codec displayed full screen: "ISDN: Connection."

Infrastructures of media communication have served the interests of imperial power and corporate capitalism as well as they have enabled alternative or even revolutionary forms of participation in the service of the people. Disconnecting, thus, becomes an operation dependent on the networks and cables of the existing power structures it strives to disrupt, with the same compression and transmission technologies applied to revolutionary and counter-revolutionary content. In Stan Douglas's work, however, disconnecting does not amount to a mere technical operation, rather it involves a detachment from habitual ways of connecting and relating that have been prescribed by the standards and formats of media technologies formed in the economic or political interest of building a global world.

In interviews, Stan Douglas has frequently mentioned the impression that Samuel Beckett's 1931 essay "Proust" made on him, referring to the memorable line, in which Beckett characterizes Proust's idea of habit: "Habit is the ballast which chains the dog to its vomit." (49) The deliberate breaking of habit has been a constant aspiration in his work, opening social and political history to other possibilities that were closed down by habitual thought and action. (50) Formats play an important role here, as they belong to an embodied history of media use in which certain ways of experiencing or perceiving may persist even after the technologies that shaped them have become obsolete. In his proposal of a theory of format, Jonathan Sterne has alluded to Panofsky's gesture of lifting the hat to make plausible the "persistence of residual imperatives in custom and sensibility" (51) prevalent in media use today. The gesture of lifting the hat, however, may not only describe the ways in which habits have served to facilitate communication between "civilized men," and the ways in which they have excluded others from this realm of civilization, producing the category of "the Australian bushman." It may also point to the measures by which such "residual imperatives" can be contested or countered—which would be another way of describing Stan Douglas's operational aesthetics of disconnection to envision other possibilities of relating to each other.

(46)
Erika Balsom, "Another Year in the Life of the Crowd," in *2011 ≠ 1848*, published in conjunction with the exhibition at the Venice Biennale, April 23 to November 27, 2022 (Cologne: Walther König, 2022), 118.

(47)
It is likely due to the use of FL that 140 bpm also became the standard speed of Grime.

(48)
See Jason Farago, "At Venice Biennale, Contemporary Art Sinks or Swims," *New York Times*, April 21, 2022, https://www.nytimes.com/2022/04/21/arts/design/venice-biennale.html; David Zwirner, "Stan Douglas 2011 ≠ 1848," https://www.davidzwirner.com/venice-2022/stan-douglas.

(49)
See, e.g., Stan Douglas in an interview with Joe Lloyd, "A Re-enactment Is an Event that Becomes Processed in Memory," *Studio International*, November 17, 2017, https://www.studiointernational.com/index.php/stan-douglas-interview-a-reenactment-is-an-event-that-becomes-processed-in-memory; Stan Douglas in an interview with Ella Huzenis, "Artist Stan Douglas Wants to Take You to Another Earth," *Interview Magazine*, January 31, 2020, https://www.interviewmagazine.com/art/artist-stan-douglas-doppelganger-david-zwirner.

(50)
"I'm trying to reconsider what has been either a discarding of personal habit or a larger cultural one, in as much as cultural forces go through the same process." Douglas in Cooke, "Broadcast Views." See also Scott Watson, "Survey: Against the Habitual," in *Stan Douglas*, ed. Carol J. Clover, Diana Thater, and Scott Watson (London: Phaidon, 1998), 30–67.

(51)
Jonathan Sterne, "Format Theory," in *MP3: The Meaning of a Format* (Durham, NC and London: Duke University Press, 2012), 1–31, here 15. In this passage, Sterne refers to the 128k standard of ISDN, which remained the default in many programs despite the higher bitrates of DSL, and attributes the preference of "university-aged listeners" for this format standard to "familiarity."

Wang Bing's *15 Hours* and the Chimera of Endlessness

Erika Balsom

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"Does the spectator ever succeed in exhausting the objects he contemplates? There is no end to his wanderings."
Siegfried Kracauer, *Theory of Film*, 1960 (1)

The complaint is by now old: major international exhibitions contain more hours of moving-image art than it will be possible for any visitor to watch. Such gripes speak to the temporal anxiety that haunts the display of moving images in a gallery. Unlike a painting, fully and immediately available to the gaze, the moving image is only ever partially there. It withholds. Its past and future states of appearance weigh heavily on the fragmentary glimpse it proffers at any given moment, tugging backward and forward in time, activating faculties of memory and anticipation. A moving-image artwork is always more than it yields in an instant, inhabiting a time of its own that flows with no regard for the viewer. The classical cinematic *dispositif* tamed this quality by imposing scheduled starting times and the hegemony of the feature film, indulging spectatorial fantasies of masterfully apprehending the whole. In the gallery, however, such assurances are not guaranteed.

When short films are installed on loop, one can choose to dwell long enough to see the work begin anew. But what of those installations of extreme length that deliberately deny such comforts? Faced with monumental running times, one option is to bemoan the surfeit of hours. Sometimes, there is good reason to do so: the immense quantity of video on display in an exhibition can be tied to a failure to secure for artworks the perceptual conditions they need to be properly appreciated. But there are also cases when artists mobilize long formats to their own ends, producing works that no viewer is expected to experience in their entirety. Instead of framing overwhelming duration as a problem or failure, what if thinking began from a recognition that the time of the image is intended to exceed the individual gaze? This is one of the things that Wang Bing's *15 Hours* (2017), a fifteen-hour account of a day in a Chinese garment workshop, asks us to consider.

Shot in August 2016, *15 Hours* was filmed in Children's Garment Workshop number 68 on Xisheng Road in Zhili Town, part of Huzhou City in Zhejiang Province (fig. 1). The titular duration is divided into two parts of the same length. *15 Hours* has frequently been described as a "single-shot documentary," whether by documenta, its commissioner, or by the Film Society of Lincoln Center in New York and Eye Filmmuseum in Amsterdam, venerable institutions where it was subsequently exhibited. In fact, filming was interrupted four times, as Wang confronted the technological limitations of digital capture. (2) There is no effort to dissimulate these cuts as, for instance, Alfred Hitchcock did in *Rope* (1948), another "single-shot"

(1)
Siegfried Kracauer, *Theory of Film: The Redemption of Physical Reality* (Princeton, NJ: Princeton University Press, 1960), 165.

(2)
As Marie-Laure Gilles, a director at Galerie Chantal Crousel put it, "Indeed, the shooting has been interrupted 4 times, because of needed to change the battery of the camera (Sony F3). Each break takes less than a minute. Actually, Wang Bing wanted to shoot in a single sequence and thought that handling the battery change would not necessarily stop the camera. But, it was not the case… After the shooting, he bought a new battery that lasts more than 15 hours and the team made a second shoot 3 days later in a single sequence of 16 hours but the result was less better than the first shoot and Wang Bing decided to keep the first shoot as final one." Marie-Laure Gilles, email to the author, June 28, 2019.

film that is nothing of the sort. Digital cameras easily overcome the roughly eleven-minute limit of shots registered on 35 mm, but even these takes cannot last forever; memory cards and batteries can only do so much. Nonetheless, *15 Hours* asserts the continuity of space and time with force, registering the rhythms and repetitions of work, all the microevents of an unexceptional day. Adopting a one to one shooting ratio, the installation effaces any difference between rushes and finished product.

An opening title card relates that Zhili Town "is home to around 18,000 small factories for children's clothing, manned throughout the year by over 200,000 migrant workers. In the 1980s, Zhejiang saw the emergence of a private capital-based garment industry open to any and all operators prepared to invest in flexible business models based on mutual credit or leasing. Today, Zhili accounts for 80% of China's output of children's clothes." Wang began filming at 8 a.m. as workers were arriving, accompanying them throughout the day, until they finished around 11 p.m. Sitting at benches equipped with sewing machines, men and women cut and stitch at a rapid pace, their income directly tied to the number of pieces they can complete in a given amount of time (figs. 2–7). The frame of the handheld camera wavers slightly as it observes them, indexing the director's bodily presence behind it, periodically reframing to articulate spatial relationships and direct attention.(3) It pans and travels to follow the workers when they move or when Wang's point of interest shifts. The camera's movement betrays the presence of an embodied intelligence behind it, yet its unblinking look remains decidedly machinic; the approach is observational without ever claiming objectivity, indexing the cinematographer's corporeal presence. In this regard, it is emphatically distant from the Warholian stare, a fixity that apocryphally allowed the artist to walk away after the camera began to roll. From time to time, a subtitle introduces an individual: "SHUAI Hongzia, 26, from Yatan, Anhui. In Zhili for 10 years." The workers chat, but not that much, largely confining their remarks to issues pertaining to their tasks. The rhythmic buzz of the machines creates a hypnotic intermittence that provides a sonic counterpoint to the flow of the image. Throughout, Wang is unobtrusive. Very occasionally, workers remark upon his presence, as when one woman invites him to join her for lunch. He declines, remaining in the empty workshop with scraps of fabric strewn over the floor and fans whirring overhead.

15 Hours is far from Wang's first long-format work. Over the last two decades, he has achieved international renown for adopting an epic scale to document the history of China and its rapidly changing present, often confronting political subjects that prevent his works from being shown in the country of his birth, instead enjoying a reception primarily in Europe and North America.(4) *Tie Xi Qu: West of the Tracks* (1999–2003), a depiction of the decline of industry in Shenyang, clocks in at 554 minutes; *Dead Souls* (2018), comprised of interviews with individuals who survived a forced labor camp in the Gobi Desert in the 1950s, is 495 minutes. These films are so long that one might deem them better suited to the gallery, but they are so dependent on the accumulating weight of time that they could seem more appropriate for the cinema. Wang has embraced both exhibition contexts, recognizing their differing affordances. Premiering

(3) The cinematography of *15 Hours* is credited to Wang Bing and Liu Xianhui.

(4) In a 2018 interview, Wang said, "None of my films have shown in China except for this year, for the first time, my last film, *Mrs. Fang*, will play at the Shanghai International Film Festival. But otherwise none of my other films have been shown, so I've kind of grown used to it." Wang Bing quoted in Annabel Brady-Brown, "This Grey Zone: Wang Bing Discusses *Dead Souls*," MUBI, Notebook Interview, May 14, 2018, https://mubi.com/de/notebook/posts/this-grey-zone-wang-bing-discusses-dead-souls.

at documenta 14, *15 Hours* was shown four times at the Gloria cinema in Kassel throughout the one hundred days of the exhibition, beginning at 7:40 a.m., but was more widely seen in the portion of the quinquennial that exceptionally took place in Athens, where it was installed at the EMST National Museum of Contemporary Art in a large central room. Minimal seating was provided in the form of four benches, but many visitors viewed the work standing, as they passed through the space. Despite his openness to flexible display conditions, Wang has stated that he makes two kinds of films, those intended for the cinema (even if they sometimes show in galleries) and those made specifically for the gallery.(5) In the first category are works such as *Dead Souls* and *Bitter Money* (2016), a 152-minute feature that, like *15 Hours*, focuses on garment workers in Huzhou but, unlike it, observes their lives at work and during leisure time, within a loose narrative arc. In the second, one finds *Crude Oil* (2008), a fourteen-hour film that premiered as an installation at the International Film Festival Rotterdam, and, of course, *15 Hours*. These are works that imagine their viewers as mobile, not subject to a necessary commitment to teleological spectatorship, freed from the burden of attending to the whole.

15 Hours might seem like a simple gesture. One might dismiss it for its lack of analysis or criticize it for being a "mere" recording, a document that has failed to become a documentary.(6) But this would be too easy. Instead, it is worth considering how the installation's presentation of a protracted duration in all likelihood to be witnessed by no spectator in its totality may be understood in relation to longstanding film theoretical debates concerning realism and the long take, debates which have in recent years been reignited by the unprecedented durational possibilities of digital capture and the emergence of a strong documentary impulse in contemporary art. Situated at the intersection of these discourses, *15 Hours* complicates key assumptions of both, exiting the cinema so as to reaffirm what for Siegfried Kracauer was a crucial capacity of film: "the power of deepening and rendering more intimate 'our relation to this Earth which is our habitat.'"(7)

* * *

Prominent theorizations of the digital cinema have focused on qualities such as hybridity, imagination, and painterliness. Thomas Elsaesser, for instance, has described digital cinema as a "graphic mode" akin to painting in its requirement of "craft and skill," deeming it "expressive" rather than "reproductive," as its photochemical antecedent before it had been.(8) For D. N. Rodowick, following the adoption of digital tools, "The image becomes not only more painterly but also more imaginative. Its powers of documentation are diminished or decentered in relation to the presentation of counterfactually conditional worlds."(9) In place of the miracle of the *acheiropoieton*—the image produced without the intervention of the human hand—the digital image heralds the return of an image all too human, tailored through the intermediary of algorithmic tools.

These assessments are not wrong. Such qualities are widespread, particularly in popular cinema, where workflows have shifted drastically to privilege postproduction as a site of creation. Yet it must

(5) Wang Bing in conversation with the author, Institute of Contemporary Arts, London, April 14, 2019, recording available on YouTube, https://www.youtube.com/watch?v=kBRHZXAU_pY.

(6) In Philip Rosen's words, "If shots as indexical traces of past reality may be treated as documents in the broad sense, documentary can be treated as a conversion from the document. This conversion involves a synthesizing knowledge claim, by virtue of a sequence that sublates an undoubtable referential field of pastness into meaning." See Philip Rosen, *Change Mummified: Cinema, Historicity, Theory* (Minneapolis: University of Minnesota Press), 240.

(7) The quotation in this passage is from Gabriel Marcel. See Kracauer, *Theory of Film*, 304.

(8) Thomas Elsaesser, "The New New Hollywood: Cinema Beyond Distance and Proximity," in *Moving Images, Culture, and the Mind*, ed. Ib Bondebjerg (Luton: University of Luton Press, 2000), 187–204, here 192–93.

(9) D. N. Rodowick, *The Virtual Life of Film* (Cambridge, MA: Harvard University Press, 2007), 105.

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figs. 1–7 Wang Bing, *15 Hours*, 2017, 16:9 film, color, sound – in two parts (7 h 55 min each), 15 h 50 min, edition of 6 + 2 AP. Courtesy of the artist and Galerie Chantal Crousel, Paris. © Wang Bing.

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also be recalled that digital technologies also offer new possibilities of durational recording. As Tiago de Luca and Nuno Barradas Jorge have noted, digital cameras have been a key condition of possibility for the cinemas of slowness that have claimed prominence in recent decades, with the long take as a favored device—something that must be kept in mind when considering how often digital cinema is yoked to notions of acceleration and a fading of reality, and how common it is to see so-called "slow cinema" as nostalgic or technophobic. (10) In the case of *15 Hours*, the affordances of digital technologies are integral to the installation and are deployed to affirm the apparatus's powers of documentation, rather than diminish or decenter them. Wang marshals the capacities of digital capture to preserve a stream of time.

In a very different way, notions of hybridity and imagination have also been central to discussions of the documentary turn in contemporary art. Since at least documenta 11, documentary practices have been a central feature of major international exhibitions and biennials. As Evgenia Giannouri has written, many artists' documentary practices engage in "an aesthetic as well as methodological deconstruction of the genre," often tempering a mimetic relation to reality in favor of formal reflexivity, fictionalization, and artifice. (11) In the critical and curatorial discourse that has taken shape around these practices, the ability to access reality is forever in question. The following statement from Hito Steyerl and Maria Lind is exemplary:

> Documentary modes [in contemporary art] still appeal to institutional modes of power/knowledge and cite their authority, but the effect is rather a perpetual doubt; a blurred and agitated documentary uncertainty, which paradoxically is extremely pertinent as an image of our times. It is precisely the failure of documentary to fulfil its pretense to certainty, which ultimately does justice to an intransparent and dubious contemporary reality. [...] Instead of denying this uncertainty, one should instead acknowledge its productive effects. (12)

Steyerl and Lind accurately assess the strategies put into play by many artists. Mannered stylization, fictionalization, and the foregrounding of subjectivity have become common ways of instilling an awareness of the inevitable gap that separates reality from representation, of grounding documentary practice in a recognition of epistemological crisis.

As I have argued elsewhere, the discourse that took shape around the documentary turn in contemporary art can be understood as a radicalization of the postmodern critique of documentary and its debunking of notions of immediacy, objectivity, and the testimonial power of lens-based capture (even as it continues to depend upon the latter). (13) Moreover, by championing artifice, understood as a locus of human creativity in opposition of the automatism of machinic recording, this discourse assimilates documentary to a traditional model of artistic subjectivity, one bound to individual expressivity. Together, these positions offer a powerful disqualification of the observational mode, a form of filmmaking grounded in the non-interventionist registration of events occurring in front of the lens. (14)

Such positions are widespread in accounts of the documentary turn in contemporary art and provide fair contextualization for many of the heterogeneous practices that fall under that umbrella—but not the work of Wang Bing. Wang is a leading figure in this tendency; although his films often premiere at prestigious festivals such as Cannes, Toronto, and Venice, since 2009 he has been represented by the Paris-based Galerie Chantal Crousel and exhibits widely in gallery and museum contexts, with funding for his projects increasingly stemming from this sphere. His commitment to durational recording and observational blankness, however, puts him at odds with the orthodoxy of documentary uncertainty. His practice is unmarked by doubt; his films demand faith in the reality of what is being shown and do not question the camera's ability to present it to view.

In his lack of fit with the paradigm of documentary uncertainty, Wang is far from alone: against its positioning as a bad object, and departing from the ubiquity of docufiction, renowned artists including Éric Baudelaire, Kevin Jerome Everson, Antje Ehmann / Harun Farocki, and many filmmakers associated with Harvard University's Sensory Ethnography Lab have embraced observational strategies. While these practices encompass an array of concerns and methods, they tend to share an interest in the long take as a compositional unit, emphasizing the qualitative integrity of the profilmic event and according primacy to the set of relations that exist within it over and above whatever capacity the filmmaker might possess to intervene, whether during shooting or at the postproduction stage. In 1993, David MacDougall wrote that "The long take has become the *terra incognita* of the modern documentary film, a blank space in a practice which devotes itself almost entirely to other properties of the shot," noting that this is "contrary to its heritage, for documentary was born in the pleasures of watching such ordinary events as leaves shimmering on a tree or a train arriving at a station." (15) These recent practices are evidence of the significant shift that has taken place since MacDougall's article was published, a shift that might be conceptualized as a dialectical response to, on the one hand, the ubiquity of CGI and intensified continuity and, on the other, the "blurred boundaries" of postmodern documentary. These practices carry forward the extensive history of the long take into a changed historical, technological, and institutional context, summoning its associations not only with realist commitments but also its ties to the formal reflexivity of the 1960s and 1970s avant-garde.

* * *

15 Hours illuminates what is at stake in this tendency by pushing the penchant for the long take to an unprecedented extreme. Although there is no precise agreement as to precisely how long a long take must be in order to be worthy of the name, its shots are surely amongst the lengthiest in the history of cinema, more akin in their duration to the relentless stare of the CCTV camera and yet sharply differentiated from this mode of visuality through the inscription of Wang's somatic presence as he winds his way through the space of the workshop. Much recent scholarship concerning the adoption of protracted temporalities emphasizes the dilation of narrative and the spectator's endurance of the glacial crawl of time, but neither applies here; there is no narrative to slow down and no assumption that the viewer will stay for a defined period, let alone for the entirety of the work.

(10)
Tiago de Luca and Nuno Barradas Jorge, "Introduction: From Slow Cinema to Slow Cinemas," in *Slow Cinema*, ed. Tiago de Luca and Nuno Barradas Jorge (Edinburgh: Edinburgh University Press, 2016), 1–21, here 10–11. For an exemplary instance of the alignment of digital cinema with acceleration and a diagnosis of slow cinema as nostalgic and technophobic, see Steven Shaviro, "Slow Cinema vs. Fast Films," *Pinocchio Theory* (blog), May 12, 2010, http://www.shaviro.com/Blog/?p=891; and *Post-Cinematic Affect* (Winchester: O-Books, 2010).

(11)
Evgenia Giannouri, "No Man's Land, Every Man's Home: Clemens von Wedemeyer's Documentary Aporia," trans. Maria Vlotides, in *Documentary Across Disciplines*, ed. Erika Balsom and Hila Peleg (Cambridge, MA and Berlin: MIT Press and Haus der Kulturen der Welt, 2016), 216–35, here 218.

(12)
Maria Lind and Hito Steyerl, "Introduction: Reconsidering the Documentary and Contemporary Art," in *The Greenroom: Reconsidering the Documentary and Contemporary Art*, ed. Maria Lind and Hito Steyerl (Berlin: Sternberg Press, 2008), 10–25, here 16.

(13)
See Erika Balsom, "To Narrate or Describe?: Experimental Documentary Beyond Docufiction," in *Deep Mediations: Thinking Space in Cinema and Digital Cultures,* ed. Karen Redrobe and Jeff Scheible (Minneapolis: University of Minnesota Press, 2021), 180–96.

(14)
Bill Nichols aligns the observational mode with direct cinema and *cinéma vérité*, characterizing it as stressing the non-intervention of the filmmaker, relying on an impression of real time, the "exhaustive depiction of the everyday," lacking retrospective commentary, and providing the "expectation of transparent access." See Bill Nichols, *Representing Reality: Issues and Concepts in Documentary* (Bloomington: Indiana University Press, 1991), 38–44.

(15)
David MacDougall, "When Less is Less," in *Transcultural Cinema*, ed. Lucien Castaing-Taylor (Princeton, NJ: Princeton University Press, 1998), 209–23, here 209.

How, then, can the temporal strategy of *15 Hours*—an installation that affirms duration to such a point that its viewer is released from the experience of it—be described? In his 1960 book *Theory of Film*, Siegfried Kracauer names endlessness as one of the medium's inherent affinities, alongside the unstaged, the fortuitous, the indeterminate, and the flow of life. All of these are at play in *15 Hours*, but endlessness deserves special attention as a concept that might help to unravel the installation's particular deployment of time and its relation to the viewer.

For Kracauer, endlessness names those instances when it is as if the medium "were animated by the chimerical desire to establish the continuum of existence." (16) Why is this desire "chimerical"? Most obviously, the "desire to establish the continuum of existence" is chimerical in the sense that it names an impossibility: perfect isomorphism between profilmic reality and filmic representation cannot exist. The filmic record will always be partial. Even in *15 Hours*, the continuous registration of the workday is rent by ellipses of roughly one minute of profilmic time each, a span Wang needed to change the battery of his Sony F3 camera. There is, however, also a second, less foreseeable and more literal meaning attached to this word in Kracauer's usage, bound to the mythological fire-breathing creature of the chimera. In his first example of filmic endlessness, one which underlines its bond with the long take, he sketches an experience of horrific monstrosity.

In a subsection entitled "24 consecutive hours," Kracauer discusses Fernand Léger's 1931 text "À propos du cinéma," a four-page essay that concludes with a paragraph in which the author imagines a day-long film. (17) Léger proposes an experiment in mediated observation, dreaming of "new and mysterious apparatuses" that would enable an average couple to be filmed for twenty-four hours without their knowledge, "without letting anything escape: their work, their silence, their private life, their love life." (18) This parable of surveillance might sound like a vision of reality television *avant la lettre* but should not be construed as such: lacking the imposition of a narrative arc, absolutely central to so-called "structured reality" programs made for broadcast, Léger imagines that this film will be presented *tout cru*, without intervention.

Léger's dream of a day-long film predates Cesare Zavattini's better-known 1952 article "Some Ideas on the Cinema," in which the screenwriter holds that cinema has an "original and innate capacity for showing things that we believe are worth showing, as they happen day by day—in what we might called their 'dailiness,' their longest and truest duration." (19) For Zavattini, a film should not show a plane pass overhead once, but twenty times. Notably, even if elsewhere he refers to Italian neorealist films, here Zavattini resorts to a fabricated example, like Léger. It is a gesture found, too, in Bazin's "The Evolution of the Language of Cinema," in which he conjures "a film by Stroheim composed of a single shot as long-lasting and as close-up as you like." (20) Prior to the experiments in duration undertaken by Andy Warhol in the 1960s, it seems that film theorists more readily located extended duration in the realm of conceptual possibility than in practical actuality. They strain beyond the limits of what was viable, what was watchable, what existed, in order to ponder the possibilities of realism. Their fabulations hint at forms of duration more radical than anything in existence at the time, forms that

(16) Kracauer, *Theory of Film*, 63.

(17) Kracauer, *Theory of Film*, 63.

(18) Fernand Léger, "À propos du cinéma," in *L'Intelligence du cinématographe*, ed. Marcel L'Herbier (Paris: Éditions d'aujourd'hui, 1977), 340 (translation mine).

(19) Cesare Zavattini, "Some Ideas on the Cinema," in *Vittorio De Sica: Contemporary Perspectives*, ed. Howard Curle and Stephen Snyder (Toronto: University of Toronto Press, 2000), 50–61, here 53.

(20) André Bazin, "The Evolution of the Language of Cinema," in *What Is Cinema?*, vol. 1, ed. and trans. Hugh Grey (Berkeley, Los Angeles, and London: University of California Press, 1967), 23–40, here 27.

would materialize in practice some decades later. When speculating on the effect of his imaginary twenty-four-hour film on audiences, Léger paints a picture distant from the feelings of humanist solidarity that emanate from Zavattini, writing, "I think that this would be so terrible that the audience would flee horrified, calling for help, as if before a world catastrophe." (21) In line with his earlier mention of "chimerical desire," Kracauer calls Léger's invention a "monster film," swiftly summoning its enormity and enormousness, that is to say, its heinousness and immensity. He concurs with Léger and elaborates: "Such a film would not just portray a sample of everyday life but, in portraying it, dissolve the familiar contours of that life and expose what our conventional notions of it conceal from view—its widely ramified roots in crude existence. We might well shrink, panic-stricken, from these alien patterns which would denote our ties with nature and claim recognition as part of the world we live in and are." (22)

This association of observational realism and panic might strike readers as a surprise, particularly coming from a theorist who wrote passionately of cinema's ability to redeem physical reality in the aftermath of the devastation of World War Two. Negative responses to long duration in cinema tend to involve soporific boredom. Indeed, Zavattini opens by acknowledging that, "No doubt one's first and most superficial reaction to everyday reality is that it is tedious." (23) Notably, the reaction Léger and Kracauer imagine is not a dull lack of interest. Their hypothetical spectators do not leave the cinema out of impatience; they flee in horror. The recent proliferation of extremely slow films provides ample empirical evidence that this frenzied exodus from the cinema does not in fact occur. Nevertheless, recognizing that "À propos du cinéma" is a thought experiment that makes use of hyperbole, Léger's account of the twenty-four-hour film remains a valuable provocation, particularly as elements of its rhetoric recur in other important discussions linking realism and duration. When Bazin imagines Stroheim's interminable film, he writes of the world "lay[ing] bare for you all its cruelty and ugliness"; Gilles Deleuze posits that the eruption of quotidian banality in neorealist cinema yields a "nakedness, crudeness and brutality which make it unbearable." (24) In short, the evocation of cruelty and horror is not Léger's alone, but a recurring trope in the theorization of a commitment to physical reality articulated through durational recording. (25)

Kracauer imagines spectators fleeing, but he does not scorn the twenty-four-hour film. In the crudeness of its continuous flow of time, the viewer confronts an undoing of one of the great myths that much of cinema conveys: that of an ordered universe of causes and effects, where individual agency reigns sovereign and threat of contingency is safely managed. Jeffrey Skoller has proposed that continuous recordings "can be seen as a counter form of documentary narration that disrupts and undermines the mass-media temporalities of journalistic and documentary film exposition, which is always already shaping outcomes while creating the impression of a process that has not yet been determined." (26) The endless "monster film" recalls not only the avant-garde's predilection for difficulty, but also its interest in the reflexive interrogation of perceptual processes and its insistence on reformulating the relationship to meaning and

(21) Léger, "À propos du cinéma," 340.

(22) Kracauer, *Theory of Film*, 64.

(23) Zavattini, "Some Ideas," 50.

(24) Bazin, "Evolution," 27; Gilles Deleuze, *Cinema 2: The Time-Image*, trans. Hugh Tomlinson and Robert Galeta (London: Bloomsbury, 2013), 4.

(25) This bracing, alienating confrontation is a far cry from the more recent assessment of slowness found in the work of Lutz Koepnick, who sees the temporal expansiveness of the long take as an attempt "to make our hearts leap again" with wonder, inciting the positive affects of curiosity and surprise. See Lutz Koepnick, *The Long Take: Art Cinema and the Wondrous* (Minneapolis: University of Minnesota Press, 2017), 18.

(26) Jeffrey Skoller, "iDocument Police: Contingency, Resistance, and the Precarious Present," *World Records* 1 (2018), https://world-recordsjournal.org/idocument-police-contingency-resistance-and-the-precarious-present/.

experience proper to the spectatorship of dominant cinema—something experimental filmmakers in the 1960s and 1970s would take up specifically in relation to duration. For structural filmmaker Malcolm Le Grice, for instance, the experience of duration creates a needed awareness of the materiality of time. (27) When the long take is pushed to new lengths and narrative development is minimized, what had seemed to be a realist device meets modernist ideals of anti-illusionism and estrangement.

The deployment of the long take found in recent experimental documentary practices straddles two traditions, taking up the avant-garde's materialist interest in temporal protraction without relinquishing a realist commitment to referentiality and social content. These practices, to borrow Kracauer's words, "pierce the fabric of conventions," thereby helping us to find "something we did not look for, something tremendously important in its own right—the world that is ours." (28) There is no claim here that cinema delivers over reality itself, fully and transparently; the desire to establish the continuum of existence remains chimerical. The paucity of editing in *15 Hours* must not be understood as an absence of form but as a radical assertion of form. Continuous recording is duplicative yet transformative, something that can crack the carapace of habit—including those habits formed through exposure to the dominant grammars of audiovisual media—such that it "dissolve[s] the familiar contours of [...] life." By pursuing the impossible isomorphism between profilmic and filmic temporalities, film can denature existence and filmic convention alike, effecting an estrangement that paradoxically occurs through mimesis. The desublimated "crudeness" and "ugliness" ascribed to the long take speak to an abandonment of classical ideals of composition and beauty, as the image is pulled down into swampy particularity, such that the spectator can become attuned to what Kracauer deemed the "murmur of existence" *and* to the dynamics of their own encounter with the image. (29)

The subject matter of *15 Hours* differs significantly from that of Léger's monster film. Trading the home for the workplace, Wang foregoes the intrusive exposure of intimacy. Like Kevin Jerome Everson's eight-hour *Park Lanes* (2015), which follows workers at a US factory producing bowling equipment, Wang leaves the hours of leisure and rest afforded to these workers off-screen, capturing life as it is lived in public, at a place of employment, focusing on manual labor in an age when so many speak of knowledge work and cognitive capitalism. But like the twenty-four-hour film, the day of *15 Hours* could be any other. The minutes and hours accumulate with nearly no interruption during this long day, and so it will the next and the next. It is here that Wang's decision to offer subtitles with information concerning how long each worker has been in Zhili takes on special resonance: the film proclaims how much time like this the individual has experienced. The installation's title, too, speaks to the void homogeneity of quantity without quality. Yet simultaneously, the day of *15 Hours* is resolutely one particular day. Preconceptions crumble in the face of concreteness. Whatever minimal structure exists—the start of work, the lunch break, the end of the day—is inundated by an undifferentiated time slight on meaning yet full of detail, presented to the spectator within a nearly uninterrupted block that insists on its presence. The stubbornly persistent images of *15 Hours* keep time in an

(27) Malcolm Le Grice, *Abstract Film and Beyond* (Cambridge, MA: MIT Press, 1977), 121.

(28) Kracauer, *Theory of Film*, 296.

(29) Kracauer, *Theory of Film*, 166.

unfolding now, claiming recognition of the world that is ours, a world of globalized flows of goods and people, outsourced production daily drudgery, and precarious migrant labor—a cruel world that is witnessed in its complexity rather than packaged and explained.

* * *

The workers endure these fifteen hours, and so does Wang, who makes his workday commensurate with theirs. As for the visitor to the installation, they are free to come and go. The claim for duration in *15 Hours* resides firmly on the side of the image and the events registered within it; it does not extend to the viewer, as it would in a cinema. How can the long take instill a sense of endlessness when the viewer is able to roam? Questioning the relevance of Kracauer's analysis of film experience to a media ecology in which the space of the cinema is no longer primary, Miriam Hansen has noted that "the dynamics of self-alienation and self-absorption, the viewer's simultaneous abandonment to the world on screen and to its centrifugal impulses, would seem to belong to a cinema *dispositif* centering on projection in a darkened theater space." (30) In the case of *15 Hours*, the release of the viewer from a durational commitment might be enough to vitiate any encounter with the brutality of a mediated reality or with the materiality of time. In dispensing with the perceptual intensity of the cinema space, one might argue that *15 Hours* lets the viewer off the hook, allowing them to appreciate the idea of the installation without actually experiencing it phenomenologically. In his text "A New Kind of Epic Film," Lars Henrik Gass takes such a view of moving-image installations, sharply criticizing what he describes as "the merely conceptual freedom of all filmic installations which, due to their duration, either turn the audience into desperate consumers or hopeless participatory dilletantes." (31)

There is certainly some validity to this position, in relation to moving-image installations in general and *15 Hours* in particular. At the same time, it is worth questioning why a use of the moving image that makes recourse to conceptualism—an undeniably central orientation within contemporary art—should be deemed an inherent problem. Instead of seeing *15 Hours* as perhaps trying and certainly failing to replicate the temporal experience of the cinema space, it is worth probing the conceptual dimension of the installation to explore how a sense of endlessness might in fact be enhanced by leaving the protocols of the movie theater behind.

Continuous recording is not the only route to endlessness, according to Kracauer. Another is found in those instances when films "caress one single object long enough to make us imagine its unlimited aspects." (32) At stake here is a sense of expansiveness, a conveyance of an inexhaustible complexity, that is suggestive of boundlessness even when real limits are present. If dwelling in the workshop for fifteen hours were not enough, the intimation of such "unlimited aspects" in *15 Hours* is abetted by the fact that the image was already there before the viewer's encounter with it and will remain there after they leave. It partakes in an obstinate *always-there-ness*, an ongoingness that endows the image with the kind of material presence dear to avant-gardists like Le Grice. The installation's title may give a precise running time, but it is one long enough so as to bleed into a

(30) Miriam Hansen, *Cinema and Experience: Siegfried Kracauer, Walter Benjamin, and Theodor W. Adorno* (Berkeley, Los Angeles, and London: University of California Press, 2012), 279.

(31) Lars Henrik Gass, *Film and Art After Cinema*, trans. Laura Walde (Zagreb: Multimedijalni Institut, 2019), 118.

(32) Kracauer, *Theory of Film*, 66.

feeling of perpetuity—particularly given the strong likelihood that the work's duration will exceed the opening hours of most institutions that play host to it. By purposefully eclipsing any single viewer's time and attention, by being always the same and always different, *15 Hours* creates a spectatorial experience that rhymes with the structure of Kracauer's caress: the encounter with a block of extended duration spurs an imagination of an absent whole that remains unverified, elusive, and thus without defined limit. It is longer—more monotonous, more arduous, yet also more replete with life and particularity—than the viewer will know.

15 Hours imagines its spectator as dwarfed by the immensity of the Zhili workday. This viewer is intermittent, partial. They will never exhaust what the image offers. The installation frustrates any pretense to mastery, any possibility of partaking in the arrogant pleasure of grasping hold of the world with certainty through the agency of the gaze—thereby preempting a perennial criticism of the observational mode. Here, the long take becomes so long that filmic time extends beyond the viewer's reasonable capacity for apprehension, dislodging them from any position of sovereignty over the represented scene, presenting the world in a manner that makes one cognizant of its infinite becoming. Attending to the endless murmur of existence, both through uninterrupted durational recording and through its proposal of an ambulatory encounter with an unverified totality, *15 Hours* pushes the long-take tradition beyond its classical iterations so as to reaffirm one of its central tenets: that a devotion to recording can give rise to forms of contact and implication that are able to unsettle and trouble the spectator in meaningful ways. (33)

(33)
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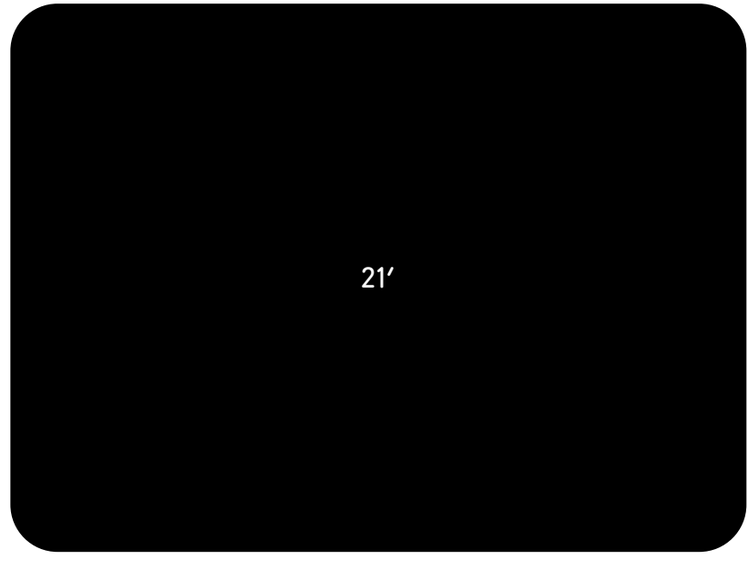
Do You Buy It? Notions of Value in James N. Kienitz Wilkins's *This Action Lies*

Laura Walde



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In 2018, James N. Kienitz Wilkins was commissioned to create an original artwork for Geneva's Biennale de l'Image en Mouvement. In Switzerland—a country without pay transparency and a longstanding tradition of bank secrecy—it is an inexcusable *faux pas* to broach the subject of how (and how much) money is earned or spent. Boston-born Kienitz Wilkins, who now works and lives in costly New York, however, is keen on talking about wages and strategies for economic survival. If one believes the narratorial voice in *This Action Lies* (2018), the film he ended up producing for the biennale, the artist received a lump sum of $10,000 from the two curators responsible for this commission. (1) Throughout the entire thirty-two-minute-long film, all the viewer sees is steam slowly rising from the hot coffee in a medium-sized Styrofoam cup made by the Dart Container Corporation with the model number 14J16. The cup appears to be filmed from three different perspectives (figs. 1–3). However, the only parameter that changes is the angle of the room's only light source; the camera itself remains stationary.

The question of what one can learn when watching something intensely—say, an ordinary disposable coffee cup—is a recurrent theme that features in several of Kienitz Wilkins's films. It is particularly prominent in *This Action Lies*, which explicitly plays with the dual meaning of *observing*: in the sense of noticing (and learning) as well as complying (and not questioning). In a small book about the fringes of cinema—*Ränder des Kinos*— Volker Pantenburg notes how the experimental practices associated with 16 mm film challenge the pre-digital theatrical standard gauge of 35 mm based on their multifaceted affinity to marginalized forms: "Experimental film opposes 'official cinema' and follows the intuition that there is something to explore rather than to narrate in the medium of film." (2) In his practice of exploring through narration, Kienitz Wilkins has it both ways.

Each of the three shots in *This Action Lies* is nine to ten minutes long and was filmed on a single roll of 16 mm stock. The shots are accompanied by voiceover monologues in the first person, second person, and third person, respectively. They are also intercut, resulting in a continuous visual and grammatical shift—giving the film a "schizoid quality" (3)—that draws attention to the friction inherent in the conflation of art and commerce. At the beginning of the film, Kienitz Wilkins, the protagonist and narrator of the voiceover, who identifies himself as "the brand," recounts the dilemma behind producing a commissioned artwork: he mentions how he has spent

(1)
The 2018 Biennale de l'Image en Mouvement was curated by Andrea Lissoni (Tate Modern) and Andrea Bellini (Centre d'Art Contemporain Genève).

(2)
Volker Pantenburg, *Ränder des Kinos: Godard – Wiseman – Benning – Costa* (Cologne: August Verlag, 2010), 16 (translation mine).

(3)
Kienitz Wilkins in an interview with Mary Helena Clark, "James N. Kienitz Wilkins by Mary Helena Clark," August 21, 2019, *Bomb* 149 (Fall 2019), https://bombmagazine.org/articles/james-n-kienitz-wilkins-1.

1

2

figs. 1–3 James N. Kienitz Wilkins, *This Action Lies*, 2018, 16 mm film, b/w, sound, 32 min. © Automatic Moving Co.

3

"every last dime making this movie" and is now faced with figuring out how to turn the resulting artwork back into money to pay rent and for his baby daughter's future college education.

As in previous films, Kienitz Wilkins places the artist—as an economic subject attempting to make a living in a capitalist context—at the center of his reflections. He is one of many contemporary moving-image artists who seems to move effortlessly between the spaces of contemporary art galleries and the international film festival circuit, which have very different, if not opposing, approaches to generating value by managing the public's access to artworks. Whereas the economic foundation of cinema, at least in its more commercial manifestation, is based on multiplication and widespread dissemination, the art market creates value through scarcity and restricted, heavily controlled accessibility. As Erika Balsom notes throughout her study on the distribution models of experimental cinema and moving images in art, the principal locus of value generation is the negotiating field between circulation and restriction, reproducibility and rarity, and the rearticulation of the concept of authenticity concerning the moving image. (4) Rather than addressing the interplay of these, at times, conflicting approaches in the films' practical existence—that is, the practices and policies of their distribution model—Kienitz Wilkins's works conceptually negotiate the continuum between artistic integrity and capitalist commerce by way of a quasi-archaeological use of language and technical formats, which I would like to demonstrate using the example of *This Action Lies*. (5)

The "attitude where the artist is like this magical figure that just delivers, and money makes its way around in these shadowy ways"—a romantic notion that goes back to the times of patronage and philanthropic endowments and is no longer viable for the 21st-century artist—is a recurrent theme thought the director's work. (6) "I'm fascinated in actually just trying to survive. I'm interested in my own day-to-day existence," said Kienitz Wilkins in a conversation about *This Action Lies*. (7) In another interview discussing his so-called *Andre Trilogy*—consisting of *Special Features* (2014), *Tester* (2015), and *B-Roll with Andre* (2015)—the director summarizes the principal tenets of his artistic practice as follows:

> Beyond aesthetics, the more important thing to me is the *political dimension of access* [emphasis mine]. I don't have any money. I make films. What do I do? How do I self-define? [...] So, the pontifications of the characters have direct real-world relationship to the restrictions and challenges and fantasies within my own practice. I'm not saying these characters are me, but to avoid talking about what is directly in front of us—*the image-making vessels, the power structures, relationship to money, delegation of labor, branding* [emphasis mine], construction of impossible fantasies, the things that are overlooked or obnoxious—is not only false, but just boring. And if I ever get rich, I expect to be very boring. (8)

This statement can be generalized to apply to his work as a whole. Kienitz Wilkins's incessant voiceover monologues, conspicuous use of various analog and digital technical formats, and his aesthetic choices construct a quasi-confessional disclosure of thoughts and (in)actions surrounding the self-definition of the artist and his work in the age of commodification, a process which he both takes part in and resists

(4)
Erika Balsom, *After Uniqueness: A History of Film and Video Art in Circulation* (New York: Columbia University Press, 2017).

(5)
The play with formats and questions of representation and valuation links most of Kienitz Wilkins's work. *The Andre Trilogy* uses successively higher resolution digital formats (first BetaSP, then MiniDV, and finally HD) in correlation with the idea of an evolution toward unbiased representation via the highest possible degree of image resolution. In *Indefinite Pitch* (2016), a film consisting only of still images, the film's narrator muses about the power of digital film formats (particularly the theatrical standard that changed from 35 mm to DCP) to produce a temporal dimension via the framerate of 24 frames per second even in the absence of actual motion. His medium-length film *Mediums* (2017), also shot on 16 mm, consists only of medium shots. The nexus of representation (particularly regarding race), cinema, labor, and capitalism is most explicitly addressed in *Common Carrier* (2018). This feature film almost consistently uses the superimposition of different images as a visual trope for anxiety over economic survival and the acknowledgment of artistic value.

(6)
James N. Kienitz Wilkins, "This Action Lies," video interview, *Filmexplorer*, January 9, 2019, 08:32 , https://www.filmexplorer.ch/detail/this-action-lies-james-n-kienitz-wilkins/.

(7)
Kienitz Wilkins, "This Action Lies," 08:46.

(8)
James N. Kienitz Wilkins, "James N. Kienitz Wilkins in Conversation with Herb Shellenberger," *Brooklyn Rail* (March 2016), https://brooklynrail.org/2016/03/film/james-n-kienitz-wilkins-with-herb-shellenberger (emphasis mine).

in equal measure. Writing about artistic *Mehrwert*, (9) Diedrich Diederichsen names the nexus of art's perceived autonomy, desire, and authorship as the most symptomatic creator of surplus value in art. He stipulates that "*Mehrwert* could [...] be understood to engage a type of complexity that cannot be taken in at a glance, the sense that there is more to be known, ultimately an inquisitive sense that something is lacking." (10) *This Action Lies* is very explicitly concerned with questions of value generation in art. Discussing this film in an interview, Kienitz Wilkins said:

> For me, the movie is very much about value and about especially branding and the inescapability of it in our culture and how we're at this peak branding kind of moment where it's very hard to locate the self. Can you even begin to talk about yourself or an individual experience or a taste-based worldview without already being subservient to some sort of category that is marketable or someone else is profiting off of? Can you be free? [laughs] I don't have an answer for that at all, but I find it comes up again and again. (11)

After a brief introduction to some of the discussions surrounding the conceptualization of value in economic and philosophical theory I consider most relevant for Kienitz Wilkins's film, I will trace moments of accounting and (e)valuation in *This Action Lies* by focusing on the forms of representational and discursive framing, on the one hand, and the playful use of technical formatting, on the other.

In 2009, Kienitz Wilkins, then a young aspiring filmmaker, sold a Canon Scoopic 16 mm camera on eBay—incidentally to no other than artist Ben Rivers, who used it to film a piece that would later be exhibited at the Tate in London. (12) Kienitz Wilkins reluctantly parted with this camera, which had great sentimental value for him, to finance his first feature, *Public Hearing* (2012). (13) The term *value* defines both a numerical quantity—the monetary worth of a product or service—and a relative measure regarding a given entity's utility or emotional significance. (14) Its plural—*values*—as "the principles that help you decide what is right and wrong, and how to act in various situations" makes manifest how this concept is lodged firmly in both the discourses of economics as well as moral philosophy (in which value theory is roughly synonymous with axiology). (15) Georg Simmel most prominently theorized about the interdependency of economic valuation, expressed in terms of money, and questions regarding social order and distinction in his seminal treatise *The Philosophy of Money* (1900). Simmel turns an analysis of modern monetary economy into a sociological inquiry—"not a single line of these investigations is meant to be a statement about economics" (16) he writes—asking how money, as exchange value for goods, impacts individuals' attitudes toward processes of valuation and society's stance on questions of value at large:

> The historical phenomenon of money, the idea and structure of which I shall attempt to develop out of feelings of value, out of praxis in relation to things and the reciprocal relationships between people and its presupposition, is studied [...] in its effects upon the inner world—upon the vitality of individuals, upon the linking of their fates, upon culture in general. (17)

I would like to emphasize Simmel's use of the phrase "feelings of value" (*Wertgefühle*), which points to the relative nature of the concepts

(9)
The German expression is retained in the English translation to indicate the double meaning of the German word *Mehrwert*, which signifies both an exceptional type of return on investment and, in the traditional Marxist sense, "surplus value."

(10)
Diedrich Diederichsen, *On (Surplus) Value in Art* (Rotterdam: Witte de With, 2008), 28.

(11)
Kienitz Wilkins, "This Action Lies," 08:54.

(12)
Clark, "James N. Kienitz Wilkins," 149.

(13)
Clark, "James N. Kienitz Wilkins," 149.

(14)
For further reading on value and valuation not directly mentioned in this text, see, for example, André Orléan, *The Empire of Value: A New Foundation for Economics*, trans. M. B. DeBevoise (Cambridge, MA and London: MIT Press, 2014); Isabelle Graw, *High Price: Art Between the Market and Celebrity Culture* (Berlin: Sternberg Press, 2010); and Pierre Bourdieu, *Distinction: A Social Critique of the Judgement of Taste* (London: Routledge, 2010).

(15)
See s.v. "values," *Cambridge Online Dictionary*, https://dictionary.cambridge.org/dictionary/english/values.

(16)
Georg Simmel, *The Philosophy of Money*, ed. David Frisby, trans. Tom Bottomore and David Frisby (London and New York: Routledge, 2004), 53.

(17)
Simmel, *The Philosophy of Money*, 52.

of money or merit in the sense that both the notion of value(s) in itself as well as the term *feelings* carry emotional qualities. In his comprehensive study *Value Theory*, Deshun Li briefly mentions, without providing further bibliographical information, that Karl Marx found the etymological root of the word *value* to lie in the Proto-Indo-European term **wal-* (the German word *Wall* means rampart), which translated as *to be strong* or *to rule* and, by derivation, suggests something highly respected or revered. "The primary meaning of 'value,'" Li writes, "is 'protective, precious, respectable and important.'" (18) The most contentious, unresolved point regarding the concept of value in the history of economic theory concerns the question of whether there is such a thing as objective value that can be measured and expressed in monetary terms or whether the market itself is chiefly responsible for creating a fiction surrounding underlying notions of value that have no measurable correspondence outside of its own evaluative framework.

In highly simplified terms, this question is negotiated in the different approaches to the creation of value propagated by the labor theory of value, on the one hand, and the theory of marginal utility, on the other. In short "while the labor theory of value assumes that value is objectively created through labor and that the worker is therefore also entitled to the acquired value, the theory of marginal utility is market-oriented in that it links the question of price and value to that of supply and demand and thus to questions of subjective evaluation and the perceived scarcity of a given entity." (19) The position of cultural products in this chain of value generation is a highly complex one. In "The Culture Industry: Enlightenment as Mass Deception," Theodor Adorno and Max Horkheimer delineate the transition from use value to exchange value once the work of art is liberated from any ritual or cultic function and fully turns into a commodity in capitalist modernity:

> What might be called use value in the reception of cultural assets is being replaced by exchange value; enjoyment is giving way to being there and being in the know, connoisseurship by enhanced prestige. The consumer becomes the ideology of the amusement industry, whose institutions he or she cannot escape. [...] For consumers the use value of art, its essence, is a fetish, and the fetish—the social valuation which they mistake for the merit of works of art—becomes its only use value, the only quality they enjoy. *In this way the commodity character of art disintegrates just as it is fully realized.* Art becomes a species of commodity, worked up and adapted to industrial production, saleable and exchangeable; but art as the species of commodity which exists in order to be sold yet not for sale becomes something hypocritically unsaleable as soon as the business transaction is no longer merely its intention but its sole principle. (20)

There is an existential antinomy in this definition of the value of modern art, in its status as a commodity in capitalist culture—"the commodity character of art disintegrates just as it is fully realized." In essence, this boils down to the abiding question of the autonomy of art. On the one hand, its fetishist characteristics—Adorno and Horkheimer use Marx's term here—mean that the artwork becomes self-sufficient and autonomous in the sense that its perceived value is wholly detached

(18)
Deshun Li, *Value Theory: A Research into Subjectivity* (Berlin: Springer, 2014), 2.

(19)
Christoph Asmuth, Burkhard Nonnenmacher, and Nele Schneidereit, "Einleitung," in *Texte zur Theorie des Geldes*, ed. Christoph Asmuth, Burkhard Nonnenmacher, and Nele Schneidereit (Stuttgart: Reclam, 2016), 9–16, here 14 (translation mine).

(20)
Theodor W. Adorno and Max Horkheimer, "The Culture Industry: Enlightenment as Mass Deception," in *Dialectic of Enlightenment: Philosophical Fragments,* ed. Gunzelin Schmid Noerr, trans. Edmund Jephcott (Stanford, CA: Stanford University Press, 2002), 94–136, here 128 (emphasis mine).

from any considerations of utility. However, on the other hand, the same motion dismantles the autonomy of art by positing that commodification in high capitalism turns all value, including the value of art, into exchange value, thereby reducing the artwork to a mere commodity like any other without any special status that could enable it to function as a critique of capitalist ideology. (21)

In this interpretation, art becomes a paradigm of a fully developed capitalist culture where exchange value reigns supreme. This contradiction of the fully realized and, at the same time, disintegrating commodity character of the artwork is not resolvable. In the words of Anthony Iles and Marina Vishmidt, this boils down to "a crisis of the reproduction of the capital-labor relationship as established in Western modernity, and thus of the social contract that holds art and labor as separate realms." (22) In an attempt to address this impasse regarding the autonomy of art, Fabian Muniesa, a researcher at the Centre de Sociologie de l'Innovation (CSI) in Paris, consequently shifts his scholarly interest from the static noun *value* to the active verb *valuation*: (23)

> Value can be understood as something that something has by virtue of how people consider it [...], but also as something that something has as a result of its own condition and of its relation to other things (for instance, in relation to work or to money, or to any sort of standard metric). Valuation, in turn, refers to something that happens to something, and this happening can be a matter of consideration or of relation, or both at the same time. In this sense, the idea of valuation may be tackled in the same way in which the notion of signification is elaborated in pragmatism—that is, as an action. (24)

With the redirection from value to valuation comes a new focus on action, on someone doing something at a specific moment in time to create value; on value as the result of a discursive and performative, as well as highly creative, process—valuation as taking action, as taking measures into your own hands. In their introduction to *Cultural Economy*, Paul du Gay and Michael Pryke think along similar lines when they argue that "economic discourse [...] is not simply a matter of beliefs, values and symbols but rather a form of representational and technological (i.e. 'cultural') practice that constitutes the spaces within which economic action is formatted and framed." (25) Kienitz Wilkins seems highly aware of these dynamic processes of discursive framing and technological formatting that feed into valuation as a performative practice of generating symbolic as well as monetary value:

> I am trying to figure out how to deal with being in a world of products but not make something which is itself a product or which can be easily categorized as a product. And I don't think it necessarily entails a complete rejection of the product, just critically rethinking it. That's kind of vague, but I've been thinking a lot lately about the distinction between product and non-product. This seems to me to be a more important battle than some of these other supposed battles we're dealing with in cinema, like fiction versus nonfiction, which seems so beside the point. How to deal with this consumer culture we're in and recognizing what works about it without being its pawn. (26)

(21)
For a discussion of Marx's value theory applied to artworks as a commodity, see Isabelle Graw, "The Value of the Art Commodity: Twelve Theses on Human Labor, Mimetic Desire, and Aliveness," *ARQ*, no. 97 (December 2017): 130–45, http://dx.doi.org/10.4067/S0717-69962017000300130.

(22)
Anthony Iles and Marina Vishmidt, "Arte Futile: The Gift That Is No-One's to Give and Which No-One Wants to Receive," in *The Trouble with Value: Art and Its Modes of Valuation*, ed. Kris Dittel (Eindhoven: Onomatopee, 2020), 18–31, here 27.

(23)
Muniesa bases his deliberations on the seminal early work of John Dewey's *Theory of Valuation* (1939), in which the philosopher and educational reformer undertakes a lengthy etymological exploration of the verbs *valuation*, *prizing*, *appraising*, *estimating*, and *esteeming*. See John Dewey, "Theory of Valuation," in *The Later Works*, vol. 13, *1925–53*, ed. J. A. Boydston (Carbondale: Southern Illinois University Press, 1981), 189–252.

(24)
Fabian Muniesa, "A Flank Movement in the Understanding of Valuation," *Sociological Review* 59, no. 2 (2012): 24–38, here 32, https://doi.org/10.1111/j.1467-954X.2012.02056.x; as part of the monograph series *Measure and Value*, ed. Lisa Adkins and Celia Lury (Malden: Wiley-Blackwell Publishing, 2012).

(25)
Paul du Gay and Michael Pryke, "Cultural Economy: An Introduction," in *Cultural Economy: Cultural Analysis and Commercial Life,* ed. Paul du Gay and Michael Pryke (London: SAGE Publications, 2002), 1–20, here 3.

(26)
Dan Sullivan, "NYFF Interview: James N. Kienitz Wilkins," *Film Comment*, October 6, 2016, https://www.filmcomment.com/blog/nyff-interview-james-n-kienitz-wilkins.

In what Dan Sullivan rightly calls a Duchampian gesture (27)—the cup as the readymade—Kienitz Wilkins's dense voiceover narration echoes the "R. Mutt" signature on the urinal, scrutinizing the artwork's conceptual relation between performance and commodity form. In the film, the narrator explains: "But what really gets me... I mean, annoys the hell out of me... is when people say movies are supposed to *do* something other than just *appearing* to do it. That movies are supposed to *respect* certain *laws*. Yes, laws. I use that word on purpose. Show not tell, right? Observe, right? A bunch of opinions." (28) As mentioned before, here, Kienitz Wilkins plays with the various meanings of the term *to observe*, both as watching carefully as well as adhering to some form of collective understanding or complying with a certain expectation.

At its core, *This Action Lies* is a study of images: how they are produced and consumed—that is, valued—and how they relate to language and knowledge—how they bring forth meaning. However, in the context of this essay, thinking of both valuation and signification as actions, as Muniesa suggests, means that rather than assigning fixed value and meaning to these images, the shots of the coffee cup form the starting point of a process, "a form of mediation, of something that happens in practice." (29) That his film is born out of a self-reflexive gesture is corroborated by the narrator's opening statement: "I'm making an apology." (30) Kienitz Wilkins refers to an apology in the literary sense of the word, namely απολογία (apologia), an autobiographical genre of writing going back to the Platonic Socratic dialogs, outlining the framework or defense of an author's viewpoint. Hence, he begins his film by listing the central tenets of the ideas he wishes to explore in a clever blending of quick-witted apologia and a resourceful gesture of selling himself short as an uncouth, uncultured movie geek whose rambling train of thought is not good value for the money that was invested in this project:

> I'm making an apology. [...] I don't see any other way around it. I've been backed into a corner, really, and it seems I've offended some through my actions. Or my lack of action. I think that's it. Or my lack of commitment... to tradition. Is it a crime to be uncultured? [...] Sorry. *This* is hazy. Off-topic. And I'm doing it again. What I always do. I need to lay a better foundation: who I am and *why* I'm doing what I'm doing. OK. My name is James N. Kienitz Wilkins. It's, like, my brand. I mean, I would never say that for real, that's pretty embarrassing but... it's kind of true. When I was in high school, I wanted to be in a band. Now that I'm grown, I'm stuck in a brand. What I've done most of my life is make movies. And movies are why I'm making this apology. It is a movie. And also, it's an apology... for movies. Cinema. The production and consumption of movies. (31)

An apology for movies ought to outline the director's position toward his medium in a self-reflexive act—"who I am and why I'm doing what I'm doing." As mentioned, I suggest that there are two principal forms of valuation that Kienitz Wilkins uses as points of departure for his rumination on the seventh art, both of which the narrator addresses in this opening statement: Firstly, there is the relation between cinema and the generating of monetary value, which is connected to the film's and the filmmaker's status as a commodity (his brand)

(27)
Sullivan, "NYFF Interview."

(28)
James N. Kienitz Wilkins, original transcript of the voiceover text sent to the author by email, August 18, 2019 (emphasis in the original).

(29)
Muniesa, "Flank Movement," 32.

(30)
Kienitz Wilkins, original voiceover transcript for *This Action Lies*.

(31)
Kienitz Wilkins, original voiceover transcript of *This Action Lies* (emphasis in the original)

and the film's ability to circulate in different formats and institutional settings. Using Marx's terminology, Diederichsen posits that an artist's brand belongs to his or her "constant capital," the fixed asset of educational background, reputation, and success on which new productive output—the artist's "variable capital"—is built. (32) The artist, not merely their artworks, through branding, becomes a commodity, which is especially compelling in the case of conceptual or performance art designed to resist the commodification of art. (33) Secondly, Kienitz Wilkins considers cinema's relation to representation and appearance—with which comes a right to (non)action—in a pragmatist sense, as something that is being done to something else instead of just "being."

In the first minutes of *This Action Lies*, Kienitz Wilkins defines himself as a filmmaker; he does not use the more comprehensive term "artist." As a filmmaker, he has, to date, directed three feature films: *Public Hearing* (2012), *Common Carrier* (2017), and *The Plagiarists* (2019); one overlength film: *The Republic* (2017), with a duration of 215 minutes; one medium-length production: *Mediums* (2017), and seven short films: *Special Features* (2014), *TESTER* (2015), *B-Roll with Andre* (2015), *Occupations* (2015), *Indefinite Pitch* (2016), *The Dynamic Range* (2018, a VR work designed for a dome projection), and *This Action Lies* (2018). I draw attention to his filmography because Kienitz Wilkins's inclination toward films with a non-standard length poses a real challenge to his economic survival. Short films are not only brief in length but also short in value for the simple reason that they are not integrated into a standardized sales structure. Other than winning prize money in a competition awarded by juries at a short film festival, there is hardly any revenue in the exhibition of short films. They are rarely bought by television networks, and if they are, then for an almost negligible sum. The budgets for paying screening fees in out-of-competition strands at international film festivals, even the major ones, are extremely minimal, if they exist at all. From an economic viewpoint, short films manifest contradictory qualities: On the one hand, they are less expensive to create owing to fewer demands on the amount of time it takes to finish them, and the number of people involved in their production. On the other hand, the lack of commercial structures for distributing these works means there is hardly any potential for financial revenue. It is not surprising that both the money invested in *This Action Lies* and the profits that should eventually come from it are tied not to the film industry but the art world. The narrator explains:

> Two European curator guys named Andrea gave me the money. [...] Anyway, the men gave me $10,000 and I spent every last dime making this movie. This apology. Shooting 16 mm film. Now I have nothing. Now I need to figure out how to turn this thing into something else: back into money. Just having it around to look at does me no good. So, confidentially, I'm thinking I'll reach out to the Museum of Modern Art in New York. I'd like to sell them this movie so I can pay for my daughter's college. I have to start thinking about this kind of stuff. I'll email the curators. Is that against the rules? (34)

This seemingly casual train of thought about the everyday challenges of a young father opens a plethora of questions related to valuation

(32) Diedrichsen, *On (Surplus) Value*, 35–37.

(33) On the artistic critique of the commodity form that engenders new forms of commodity itself, see Graw, "The Value of the Art Commodity," 132.

(34) Kienitz Wilkins, original voiceover transcript for *This Action Lies*.

in art, both financially and metaphorically speaking: If the lump sum of $10,000 was used to cover the necessary material (film stock, processing, and transfer), how was the artist's labor taken into consideration? Is it the responsibility of artists to be efficient in their time management and prudent in their choice of working materials to provide financial security for themselves and their families (that is, to balance the proportion of constant capital to variable capital to guarantee a high rate of surplus value)? Does the artwork have any intrinsic value ("just having it around"), or does value only come once it has entered into a relationship with the public sphere? How does the art market create and define the value of an artwork? Must the artist simply observe these unwritten rules, or can they actively influence them? Or would that mean they are selling out?

In the following sequence, Kienitz Wilkins's eponymous narrator changes from speaking in the first person to second person, shifting from a confessional, highly personal tone to a more conspiratorial one. These grammatical shifts point to various unresolvable conflicts regarding the status of the artwork and the artist and valuation as "a process which doesn't add clarity." As the narrator says:

> OK. Here's a secret. What if you found out this movie is more expensive than it looks. Like, a more expensive medium like 35 mm film. [...] What if it was not only shot on 16 mm film, then edited and finished digitally, as most movies are these days, but was additionally transferred to 35 mm, then transferred *back* again to digital. Which is what you see now. Would you be impressed? So this digital movie contains all the history, the process, whatever. But a process that doesn't add clarity, no, to the contrary: what's shot has been shot. [...] Once again, you probably think this is trivial stuff. That's there no real stakes in this setup. But you've gotta look closer, because if a 35 mm print exists, then that's an object to sell. A single, one-of-a-kind version on 35 mm film, finished and complete and integrally connected to all that's come to pass. Yet a version totally unavailable, beyond your grasp, something completely unique and rooted in space and time, and utterly immaterial for the same reasons. It's a stand-in. Or maybe this movie is the stand-in? In any case, *this* movie is not *that* movie, at least according to the grounds of the grain: No, *that* movie might as well be locked somewhere in a room that can only be imagined, to be screened... and fully observed... by a person who is not you. (35)

As Erika Balsom notes, the concept that a "single, one-of-a-kind version on 35 mm" would bring back the artwork as a unique object to be traded was first tested by New York gallerist Julian Levy in the early 1930s, when he tried to sell film prints as art objects. (36) The fact that the final digital movie contains the different actions of its creation process, the traces of its formats, could be said to add a sort of "surplus value." Comparable to this is the way Isabelle Graw assigned value to the strips of Banksy's *Love is in the Bin* (2018), the remaining artifact of the artist's auction house coup in which *Girl With Balloon* (2006) was shredded immediately after it was sold for a record sum at Sotheby's London in 2018. (37) The narrator does not go into the practical details of selling a film to a museum, which

(35) Kienitz Wilkins, original voiceover transcript for *This Action Lies* (emphasis in the original).

(36) Balsom, *After Uniqueness*, 126.

(37) Isabelle Graw, *Three Cases of Value Reflection: Ponge, Whitten, Banksy* (Berlin: Sternberg Press, 2020), 52.

would surely entail discussions about editioning and the question of whether distribution in a rental model outside of the museum's premises would still be allowed. When *This Action Lies* was exhibited at Spike Island in Bristol, two sealed 35 mm film canisters were presented alongside the digital projection of the film, "subtly poking fun at the value and authenticity of analog film as a medium, creating a disconnect between the experience of watching film and its materiality." (38) The narrator's thought experiment is relatively conservative in that it proposes the generation of value in restriction rather than dissemination. In practice, however, Kienitz Wilkins's work gained traction on the international film-festival circuit and through numerous showings at repertory cinemas and in art shows. If his films were to be hidden in the vaults of major institutions such as the MoMA, it is highly debatable whether this would help him secure his day-to-day existence at this point in his career.

The twice-posed question "would you be impressed?" and the narrator's repeated insistence on his lack of cultivation and uncouthness point to a nexus that exists between valuation and knowledge. In the tradition of the court jester, who has a special license for telling unflattering truths even to those in power, Kienitz Wilkins plays the fool without being played for a fool. The close connection between knowledge and monetary power is prominently displayed in the English language by idiomatic phrases such as "buying into something" (believing in it) or "selling yourself short" (underappreciating your qualities). Kienitz Wilkins is a graduate of The Cooper Union's School of Art in New York, so intellectual and artistic awareness are part of his *constant capital* as a highly trained and specialized worker in the field of art production. As consumers of his films, how enlightened are we about the mechanisms of valuation the artist unfolds before our eyes? Do we buy (into) them?

In *This Action Lies*, the use of 16 mm film, which today is associated both with underground filmmaking and the revitalization of an obsolescent film format via the reappropriation by the art world, openly clashes with the highly elaborate light composition, reminiscent of glamorous productions of the classical Hollywood era or studio photography for high-end advertising campaigns. The artist stages a profane, cheap, and disposable object associated with contemporary throw-away society as an artwork worthy of deep contemplation. The spiritual dimension of its auratic quality is visible in the evaporating steam (the only evidence that this is a moving image and not a still photograph). Kienitz Wilkins is a witty conceptualist who mainly uses words and few images, whose changes in format reflect on the connection between infrastructures and monetary value. These shifts from analog to digital film and vice versa serve as a visual trope for exploring topics with an intimate connection to valuation as an act(ion) of measurement, which includes establishing relations between knowledge, representation, and branding; money and consumer culture; and technology and image circulation in digital networks. (39)

Kienitz Wilkins is a rare example of an experimental filmmaker of whom you could say that he distrusts images to be the primary source for getting the action rolling; he regularly deprioritizes images by heavily relying on spoken storytelling. Kienitz Wilkins is thus an accountant in the very polysemic meaning of the word, acutely aware of how discourse shapes our knowledge and evaluation of the world that surrounds us: "Etymologically rich, the term [accounting] simultaneously connotes bookkeeping and narration. Both dimensions entail evaluative judgments, and each implies the other: Accountants prepare storylines according to established formulas, and in the accounts given by a good storyteller we know what counts." (40) Etymology, said Kienitz Wilkins in an interview, is an essential point of reference in his work, a "fun and useful starting point." (41) The origin of the term *account* lies in *aconte*, the Old French word meaning *to reckon*, with its root in the Latin *computō* (to sum up). (42) The verb in the somewhat cryptic title of *This Action Lies* does not refer to the act of deceiving (lying as speaking an untruth) but rather the Old French legalese expression "*c'est action gist*," which can be directly translated into the Anglo-French idiom "this action lies" (the verb stemming from the French *gésir*, meaning to lie, to be located) and which used to denote the principle activity that provided sufficient grounds to proceed in prosecution—that is, to take action. The English term *gist*, meaning the essence or central point of an argument, is derived from this phrase. In his practice, Kienitz Wilkins accounts for words and money, measuring their impact and tracing how they generate value. He is interested in the formalities of how debit and credit relate to an artwork's production and in the exploration and exposition of reasons and motivations behind certain evaluative measures directly related to the artist's subsistence. The title of his film, *This Action Lies*, attests to a desire to think about the film's performative and pragmatist aspects—its aptitude for taking measures.

(38)
Quote from the exhibition text posted on the Spike Island website on occasion of the solo exhibition by James N. Kienitz Wilkins, Spike Island, Bristol, July 6–September 8, 2019, "James N. Kienitz Wilkins: *This Action Lies*," Spike Island, https://www.spikeisland.org.uk/programme/exhibitions/james-n-kienitz-wilkins.

(39)
For a discussion on the use of *format* as a term to analyze the relationship between infrastructures, standards, and economic functions, see, for example, Axel Volmar, "Formats as Media of Cooperation," *Media in Action*, no. 2 (2017): 9–28, https://doi.org/10.25819/ubsi/8172.

(40)
David Stark, *The Sense of Dissonance: Accounts of Worth in Economic Life* (Princeton, NJ and Oxford: Princeton University Press, 2009), 25.

(41)
Clark, "James N. Kienitz Wilkins," 149.

(42)
See s.v. "account," *Merriam-Webster Online Dictionary*, https://www.merriam-webster.com/dictionary/account.

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Simulated Memory and the Wired Brain
The Emerging Superordinate Precariat

Warren Neidich

35′

This essay speculates that we are in the midst of a transition from an information- and knowledge-based economy to one that can be described as neural- or brain-based. Just as the burgeoning industrial economy subsumed craft and agricultural economies, and the information and knowledge economies of the late-20th and early-21st centuries subsumed the industrial economy, this imminent brain-based economy will subsume those that preceded it. The essay will investigate the socio-political, economic, and cultural repercussions of this transformation upon the psyche, especially regarding their effect on subjectivity—most notably the mutation of the cognitariat or mental laborer to the superordinate precariat.

My use of the word "brain" differs somewhat from vernacular usages. The brain is not simply a crystallized, unchanging system of relations residing inside the skull, as many positivist cognitive neuroscientists would suggest. Rather, it is an intra-extracranially situated complex characterized by a rhizomatic structure. Rhizomes construct maps that are "always detachable, connectable, reversible, modifiable, and [have] multiple entryways and exits and [their] own lines of flight [...]. [A rhizome] is an acentered, nonhierarchical, nonsignifying system without a General and without an organizing memory or central automaton, defined solely by a circulation of states." (1) Yes, the brain has an intracranial component consisting of populations of neurons and their complex synaptic array. However, its capacities are also situated, embodied, enacted, extended, and distributed. For example, a mobile performer's/actor's eyes and their attendant physiological capacities are attuned to certain wavelengths of light, and because the axis of each eye in comparison to the other is misaligned by four degrees, they experience depth perception. The brain-gut-microbiome axis, as described by Clair R. Martin and colleagues, for instance, sets up a bidirectional interactive flow between the gut microbiome and the brain:

> Gut microbes communicate to the central nervous system through at least 3 parallel and interacting channels involving nervous, endocrine, and immune signaling mechanisms. The brain can affect the community structure and function of the gut microbiota through the autonomic nervous system, by modulating regional gut motility, intestinal transit and secretion, and gut permeability, and potentially through the luminal secretion of hormones that directly modulate microbial gene expression. (2)

(1)
Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, trans. Brian Massumi (Minneapolis: University of Minnesota Press, 1987), 21.

(2)
Clair R. Martin et al., "The Brain-Gut-Microbiome Axis," *Cellular and Molecular Gastroenterology and Hepatology* 6, no. 2 (April 2018): 133–48.

Furthermore, this intracranial and situated brain becomes rhizomatically entangled with the evolving sociocultural-technological milieu that forms its extracranial counterpart. Together these systems bridge, on the one hand, a predisposed and experientially sculpted array of intracranial, vibrant neural elements, such as the sensorial cortices and their connections, to their respective association areas. On the other hand, they link sensorial technologies without limit that see the heavens and listen to the rumblings of the deep history of the Earth from which animal, plant, mycelial, and human consciousness evolved. Today these relations form interacting data sets used in a myriad of contexts, collectively feeding the Cloud and forming the various platforms of global cosmotechnics. (3)

As we will see shortly, the capacities of these technologies, the unique temporal and spatial dimensions they engage and make available, become materialized in the psychic flows that define the local and global network communication of the intracranial brain—something Bernard Stiegler refers to as "exosomatic organogenesis." (4) At the heart of this text is this concept of exosomatic organogenesis in which technical rather than genetic evolution is at the core of the liberation and perfection of organ systems, especially the brain. I propose that these new neural-based technological ecosystems are radically different from those that preceded them and that these differences have significant consequences for the meaning of the brain and subjectivity. Important in this respect is the intimate relationship these technologies have in directly modulating the brain's capacity for change, its so-called neuroplasticity, in ways never thought possible. This essay concentrates on one of these technologies—the "wired brain"—and describes its potential capacity for healing, rehabilitation, and emancipation, but also surveillance and despotism. As we will see this wired brain in the expanded sense is an important force in the mutation of the cognitariat to the superordinate precariat.

Central to my argument is that we are in the midst of a transformation from cognitive capitalism, in which the brain and mind are the new factories of the 20th century to that of neural capitalism. In cognitive capitalism, especially its early phase, the subject is subjected to psychopower gladly giving up their rights to privacy to be able to take part in the digital economy, whereas in neural capitalism they are subject to neuropower in which the brain's neural plasticity is the new site of neoliberal exploitation. We are no longer proletariats working on assembly lines and making objects and things, but rather cognitariats working in front of screens, searching the web, and liking posts on Facebook and Instagram. This condition intensified during the pandemic in which digitality has overwhelmed our lives and the simulated world overwhelms our attentional capacities. Furthermore, immanent neural technologies like brain-computer-interface linked to the Internet, VR, and AR promoted by companies like Neuralink, Facebook, and Synchron, advance media technologies already in use (such as cinema and gaze-directed virtual platforms), which had played a role in the society of the spectacle. As we will see these new technologies intercede between the intracranial brain and the extracranial brain, bringing about the transformation of the cognitariat to the superordinate precariat. They are a response to the new advanced contingencies of digitality that require new speeds of mental laboring and levels of attention to produce increases in the surplus value of intellectual labor. As Elon Musk has said about the merger of biological and digital intelligence, "It's mostly about the bandwidth, the speed of the connection between your brain and the digital version of yourself, particularly output." (5) Facebook's Building 8 "moon shot" division is also involved in the telepathy race with its new thought-to-text technologies, which will be at least five times as fast as typing on a mobile phone and will not interfere with driving (or so Facebook claims). As reported in *Scientific American*:

> As if Facebook wasn't already pervasive enough in everyday life, the company's newly formed Building 8 "moon shot" factory is working on a device they say would let people type out words via a brain-computer interface (BCI). If all goes according to plan—and that's a big if—Building 8's neural prosthetic would strap onto a person's head, use an optical technique to decode intended speech and then type those thoughts on a computer or smartphone at up to 100 words per minute. This would be an order-of-magnitude faster than today's state-of-the-art speech decoders. (6)

The complexity of our present condition requires an equally complex argument to unpack the vagaries of this prescient moment and its effects upon labor and subjectivity, which is the basis for the mutation of the cognitariat to the superordinate precariat. In that regard, I have structured this essay accordingly in eight sections, which I hope will enlighten the reader as to the process and characteristics that describe this transformation: (1) The Brain Without Organs and the Intra-Extracranial Situated Complex, (2) From the Cognitariat to the Superordinate Precariat, (3) Neural Technics, (4) Suturing, (5) Epiphylogenesis, Multiple Superimpositional Exteriorization, and Organogenesis, (6) Neural Epiphylogenesis: Technicity and Selective Stabilization, (7) Three Orders of Simulation: Formatting Authentic, Prosthetic, and Irreal Memory, and (8) Telepathy.

The Brain Without Organs and the Intracranial-Extracranial Situated Complex

"The brain without organs" is a phrase based upon the idea of the body without organs originating in the writings of Antonin Artaud and paraphrased by Gilles Deleuze and Félix Guattari in *A Thousand Plateaus* (*Mille plateaux*, 1980). Artaud wrote, "The body is the body/ it stands alone/ it has no need of organs/ the body is never an organism/ organisms are the enemies of bodies." (7) According to Deleuze and Guattari, the problem of the organism is to make an alternative body without organs, which is permeated and unleashes its unformed "unstable matters, by flows in all directions, by free intensities, or nomadic singularities, by mad or transitory particles." (8) Like the body without organs, the brain without organs must also create an alternative brain without organs with which to free itself from the imprisoning intensities of the material arrangements created by the genetic code, on the one hand, and the politicized sociotechnological milieu (today represented by the plethora of machine learning and wired brain technologies), on the other. Founded as it was to combat the dehumanizing effects of Fordist labor and the structures that constitute psychodynamic paradigms such as the Oedipus Complex, under cognitive capitalism, the radicalizing effects of the body without organs are diminished as a form of resistance

(3) See Yuk Hui, "Writing and Cosmotechnics," *Derrida Today* 13, no. 1 (2020): 17–32.

(4) Bernard Stiegler, *Nanjing Lectures 2016–2019*, ed. and trans. Daniel Ross (London: Open Humanities Press, 2020), 301.

(5) Arjun Kharpal, "Elon Musk: Humans must merge with machines or become irrelevant in the AI age," *CNBC*, February 13, 2017, https://www.cnbc.com/2017/02/13/elon-musk-humans-merge-machines-cyborg-artificial-intelligence-robots.html.

(6) Larry Greenemeier, "Facebook Launches 'Moon Shot' Effort to Decode Speech Direct from the Brain," *Scientific American*, April 27, 2017, https://www.scientificamerican.com/article/facebook-launches-moon-shot-effort-to-decode-speech-direct-from-the-brain/.

(7) Artaud quoted in Deleuze and Guattari, *A Thousand Plateaus*, 158.

(8) Deleuze and Guattari, *A Thousand Plateaus*, 40.

and no longer up to the task. The transition of the proletariat to the cognitariat requires new techniques emanating from a radicalized theoretical framework to manage cognitive labor and the psychopharmaceutical regimens required to treat its psychopathologies. The brain without organs is such a structure.

In the transition from early cognitive capitalism to its later (neural) stage, the focus changes from the fixed capital of the assembly line to the circulatory capital of the brain's assemblages of psychically infused neural networks in living action. The Canadian neuropsychologist Donald O. Hebb was the first to postulate that when two neurons fire together, their shared synapse changes. Hebbian theory, often paraphrased as "Neurons that fire together wire together," understands that nervous activity can leave a trace that can be modified and transformed. (9) Long-term memory storage, the result of long-term potentiation at the synapse, together with short-term memories put in play by internalized selective attention represents the new archive—the internalized "Mnemosyne Atlas," or the "Bilderatlas Mnemosyne," as it was originally referred to by Aby Warburg—in cognitive capitalism. Neurons, neural networks, and their fiber connections participate in local and global networks, linking, for instance, the visual cortex in the posterior, or caudal, part of the brain to the actions of the frontal eye fields located in the frontal lobes in its rostral pole. These connections provide visual short-term memories, activated from long-term memory, providing the raw material for internal narrative constructions referred to as "scenario visualizations." (10) The mind's eye was in the past the expression that referred to this site of this mental reenactment. Today it is delineated by the combined system of long- and short-term memory and internal selective attention. The archive—as described by Michel Foucault in *The Archaeology of Knowledge* (*L'archéologie du savoir,* 1969), as an analytic concept, an institution of register and collection and a place of aesthetic productions or heterotopias—has been recently also appreciated as a place regulated and imbued with power. The exposure of the use and manipulation of the archive by the KGB and Stasi and the recent assault on truth in our age of electronic surveillance has put these concerns front and center. In cognitive capitalism the site of archivalization and its susceptibility to control has shifted to the mind's eye. Working memory as an a priori phenomenological techne has become entangled with real, material institutions of collection and register. In cognitive capitalism, new technologies at hand and soon to be available, will expand the jurisdiction of the digital dominion to include the archive of memories and their internal performance in ways never before possible—this is, in fact, the real meaning of endo-colonization. The internal narratologies that constitute the capacity for self-reflexivity and contemplation, will be normalized, when brain waves, aided by brain-computer interfaces (BCIs) linked to the net, instead of mouse clicks become tracked and datafied. This form of governmentalization marks the transition from biopower to neuropower, in which populations of brains (rather than bodies) become the subject of a new sovereignty's jurisdiction. As discussed later, internal attention and working memory are subject to the whims of the wired brain. The wired brain may one day help mold the connections of the imagination and the short- and long-term memories used to concoct it.

(9) Donald O. Hebb, *The Organization of Behavior: A Neuropsychological Theory* (New York and London: Wiley and Sons, 1949).

(10) Shani Offen et al., "Differential roles for frontal eye fields (FEFs) and intraparietal sulcus (IPS) in visual working memory and visual attention," *Journal of Vision* 10, no. 11 (September 2010): 1–28, here 28, https://doi.org/10.1167/10.11.28.

As we will see in the following, there is a close relationship between exosomatic organogenesis and working memory and the mind's eye. In his introduction to Stiegler's *The Neganthropocene*, Daniel Ross states that from 2014 onwards, Stiegler less frequently spoke about the process of exteriorization, a principle borrowed from André Leroi-Gourhan in which germinal evolution caused by alterations in the gene, or endosomatic organogenesis, is subsumed by what is referred to as exosomatic organogenesis, or the technical evolution of exterior artificial organs which become internalized through epiphylogenesis. (11) Exosomatic organogenesis has been essential to the process of hominization over the past two million years which is still continuing today.

> Hominization is the continuation of organogenesis but in an exosomatic way. As with many organs, the brain has always organologically "augmented" and transformed itself: this self-transformation is precisely what characterizes human life inasmuch as it is also and immediately technical life, that is, a form of life that realizes its dreams. (12)

The brain without organs is a form of resistance to late-stage cognitive capitalism in which the material brain and its connections become the focus of power. Organogenesis is dependent upon repetition, patterning, synchronization of input, omnipresence, excess accumulation, and negentropy. By contrast, the brain without organs is dependent on variation, entropy, chance, alterity, otherness, contingency, and emergence. As we will see in the section on telepathy this process of exosomatic organogenesis is essential.

(11) Daniel Ross, introduction to Bernard Stiegler, *The Neganthropocene*, trans. and ed. Daniel Ross (London: Open Humanities Press, 2018), 7–32, here 26.

(12) Stiegler, *Nanjing Lectures*, 242.

From the Cognitariat to the Superordinate Precariat

This essay investigates an assortment of neural technologies in various stages of development that have had (and will have) important political, economic, and social consequences for our mental and intellectual livelihoods. These are part of an assortment of technics focused on privatizing the neural commons of the cognitariat or the cognitive-digital worker. (13) They join Big Pharma, artificial intelligence and machine learning, neural consumerism and economics, parametric architecture, and Big Data to produce what I am calling neoliberal neural capitalism. Together, they form an ensemble of technologies that may have the capacity to cause mutations in subjectivity itself as the cognitariat of early cognitive or semio-capitalism is transformed into the superordinate precariat of late cognitive or neural capitalism.

The term "precariat" was originally used to describe a subset of the general working class that emerged during the Thatcher-Reagan years consisting of people who engaged in unstable labor, such as itinerant, short-term workers with zero-hour contracts, whose safety was at best perilous because they relied on wages without non-wage benefits. The term "precarious" was adopted by post-operaismo Italian scholars to describe one of the characteristics of digital laborers, or the cognitariat. The term "superordinate precariat," a compound phrase used here to distinguish it from earlier forms, describes a subjectivity in which the exaggerated conditions of isolation and 24/7 digitality (exemplified during the Covid-19 pandemic) accentuate already ongoing trends within digital interaction. As a result of this intense interaction with digitality, this subcategory, first

(13) By "neural commons," I mean the commonwealth of the material brain, its material variable components, such as neurons, dendrites, and synapses, and processes such as binding, in which individual features of objects are tethered together or segregated through the synchronized and desynchronized activity of different neurons in the cortex of the brain. Synchronization is vital for neural diversity and plasticity. See Wolf Singer, "The Role of Synchrony in Neocortical Processing and Synaptic Plasticity," in *Models of Neural Networks: Temporal Aspects of Coding and Information Processing in Biological Systems*, ed. Eytan Domany, J. Leo van Hemmen, and Klaus Schulten (Berlin: Springer, 1994), 141–73.

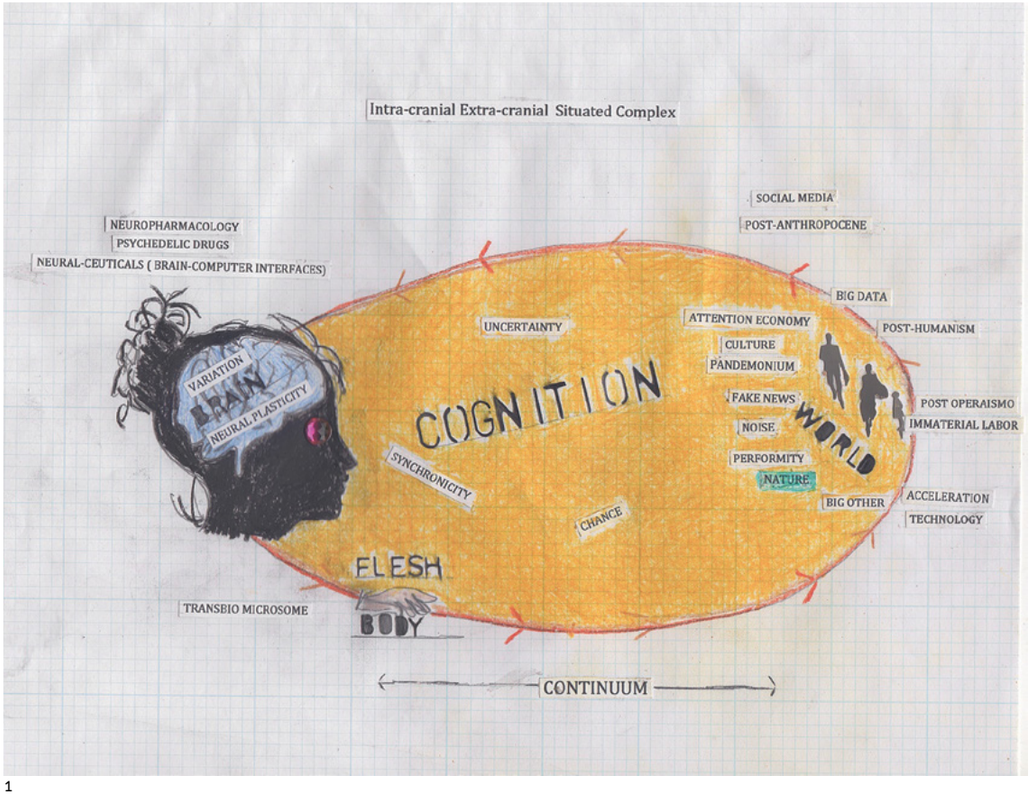

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fig. 1 Warren Neidich, *Intracranial-Extracranial Situated Complex*, 2021, pencil on paper, 8.5 × 11 inches, Gallery Priska Pasquer, Cologne, 2020.

fig. 2 Warren Neidich, *Telepathy Drawing*, 2020, pencil on paper, 30 x 40 inches, artist studio, Berlin.

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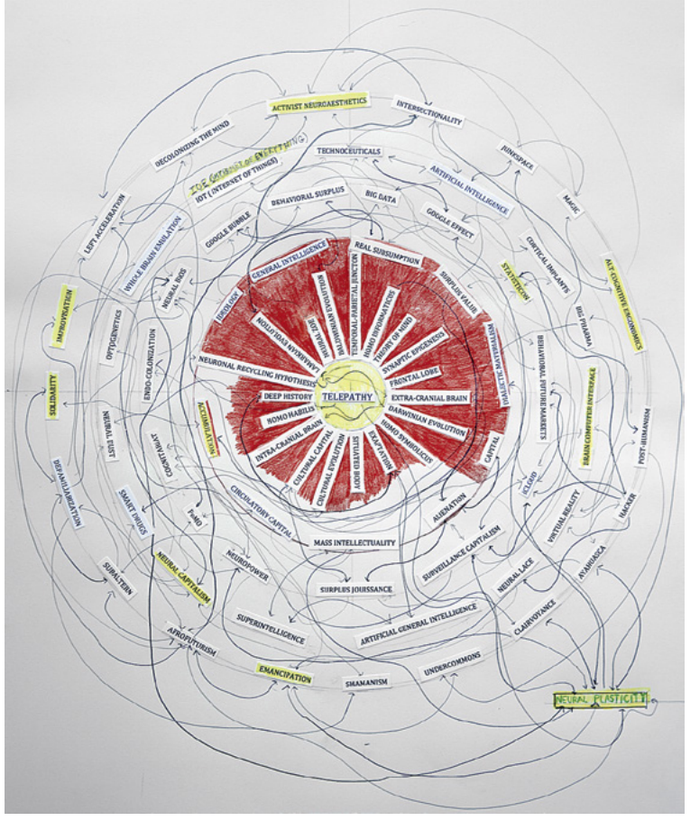

used to describe an aspect of the cognitariat, hypertrophies to become a subject designation of its own. It describes a form of subjectivity yet to come, in which we are all linked in a network command system called the "wired brain," as described by Slavoj Žižek in his book *Hegel in a Wired Brain* (2020): "'Wired brain' refers to a direct link between our mental processes and a digital machine, a link which, while it enables me to directly trigger events in reality with a mere thought [...] also enables the digital machine to control my thoughts." (14) The wired brain is the latest technic that, in the future, will overwhelm and subsume all other technics and, through its accumulation, to instigate a novel exosomatic organogenesis in which our telepathic capacities will become accentuated. (15)

I am speculating that beyond the precarity normally experienced by the cognitariat—such as extreme insecurity in employment caused by short-term contracts, working alone, experiencing dissolidarity from other workers, and disassociation from care networks—an assortment of new distinguishing characteristics will emerge. Among these are neural subsumption, irreal memory and telepathy. These will induce new forms of insecurity, uncertainty, and self-doubt, and with them, contemporary psychopathological conditions linked to alienation, which I refer to as "memory disconnection syndrome" in which competing forms of memory, in this case real, prosthetic and simulated or irreal compete for predominance in the theater of the mind's eye and consciousness. As Georges Canguilhem states in his book *The Normal and the Pathological (Le Normal et le pathologique*, 1966), "humankind is characterized by the fact that it produces its own milieu, its own living environment, and this self-production constantly confronts an infidelity to itself that it structurally secretes throughout the exosomatic organogenesis in which the irresistible concretization of its technicity consists." (16) Each epoch creates its own socio-cultural technological pattern, which confronts the inadequacies of its former self-realization, and the exosomatic organogenesis it was sculpted by must be deterritorialized to be formed anew.

(14)
Slavoj Žižek, *Hegel in a Wired Brain* (London: Bloomsbury, 2020), 19.

(15)
See Stiegler, *The Neganthropocene*.

(16)
Georges Canguilhem, *The Normal and the Pathological*, trans. Carolyn R. Fawcett (New York: Zone Books, 1989), 64.

(a) Neural Subsumption

Neural subsumption, a part of what Antonio Negri calls "total subsumption," designates the new imminent form of subsumption that is an inflation of the term "real subsumption," in which the entirety of life itself becomes work. Echoing Mario Tronti's idea of the social factory, Negri argues that labor is no longer restricted to the location of the factory, but that capital reaches down into the molecular structures of our bodies to extract surplus value. (17) In late-stage cognitive capitalism, that molecular entity is the neural synaptic junction—the site of long-term potentiation or long-term memory. Long-term memories are crucial for the practice of scenario visualization. Working memory extracts and mobilizes short-term memories from long-term memory to construct future narratives in the mind's eye. In late-stage cognitive capitalism, the mind's eye has replaced the distribution of the sensible or "le partage du sensible," as first described by Jacques Rancière in *The Politics of Aesthetics* (*Le Partage du sensible*, 2000), as the site of subjectivation. (18) Instead of the laws governing the sensible order and the external attention networks it constitutes thus establishing modes of perception and forms of participation in a common world, a shift has occurred toward an endocolonization

(17)
Antonio Negri, "Twenty Theses on Marx, Interpretation of the Class Situation Today," in *Marxism Beyond Marxism*, ed. Saree Makdisi, Cesare Casarino, and Rebecca Karl (London: Routledge, 1996), 149–80.

(18)
Jacques Rancière, *The Politics of Aesthetics*, trans. Gabriel Rockhill (London: Continuum, 2004), 85.

of the image of thought(s) that constitutes cognition and the vernacular of the theater of the mind's eye. As we will see shortly, power is now primarily directed at normalizing the brain's neural diversity and policing the mind's eye in producing a homogenized population of people who are easy to govern. The new technologies of neural capitalism, especially those of the wired brain, constitute the conditions for neural subsumption in which our thoughts, both conscious and unconscious, are made legible and digitally alive. Consequently, the transparent workings of the mind will become opaque and subject to the sovereignty of Big Data and what Shoshana Zuboff calls the "Big Other." New software like Pegasus spyware, which covertly takes over a mobile phone, will be developed to surreptitiously take over virtual BCI systems embedded in the Internet of Everything. This, then, will become the new organologic milieu:

> It is a ubiquitous networked institutional regime that records, modifies, and commodifies everyday experience from toasters to bodies, communication to thought, all with a view to establishing new pathways to monetization and profit. [...] Each one of us may follow a distinct path, but that path is already shaped by the financial and, or, ideological interests that imbue Big Other and invade every aspect of "one's own" life. False consciousness is no longer produced by the hidden facts of class and their relation to production, but rather by the hidden facts of commoditized behavior modification. (19)

What happens when experience is replaced by mere thought and work is performed at the speed of thought? If brain waves generated by a subject can be used to manipulate a cursor on a computer screen to direct a robotic arm or move a wheelchair. Using convolutional neural networks, Haiguang Wen and his team were able to reliably decode and interpret electrical signals recorded from the visual cortex and related areas of subjects watching movies. (20) It is not such a radical jump to consider the possibility of the opposite happening. Artificial neural networks driven by machinic intelligence may soon generate patterns of electrical potential that can enter the intracranial brain and directly modulate its local and global activity. Additionally powerful patterns could activate neural synaptic junctions responsible for neural plasticity itself especially in young and teenage subjects during what are called critical or sensitive periods of neural development affecting the brain's neural architecture. I will suggest that through the actions of the brain without organs acting on the brain's neural plasticity in the context of an overwhelming future telematic environment a dedicated module for telepathy will arise as a form of evolutionary resistance.

(19)
See Shoshana Zuboff, "Big Other: Surveillance Capitalism and the Prospects of an Information Civilization," *Journal of Information Technology* 30 (2015): 75–89, https://doi.org/10.1057.

(20)
See Haiguang Wen et al., "Neural Encoding and Decoding with Deep Learning for Dynamic Natural Vision," *Cerebral Cortex* 28, no. 12 (December 2018): 4136–60.

(b) Irreal Memory

Irreal memory joins neural subsumption as the second key component producing the superordinate precariat class in the 21st century. As described later, it is produced by an entity that is "not unreal, but a simulacrum never again exchanging for what is real, but exchanging in itself, in an uninterrupted circuit without reference or circumference. [...] It is a short-circuit of reality and a reduplication by signs." (21) Irreal memory is a state of absolute manipulation! It is the product of technological acceleration applied to the situated

(21)
Jean Baudrillard, *Simulations* (New York: Semiotext(e), 1983), 4.

intra-extracranial complex brain of the cognitariat, whose attention, captured inside a hall of mirrors, can no longer differentiate between the real, the imaginary, and the virtual. As a result of the entangled, ideologically contested mediarchal milieu, the cognitariat's nervous system, consisting of long-term memories and their neural substrate, is pruned.

As I will describe later in more detail, there are three orders of the simulacrum, each linked to a different form of memory. The first order is based on the counterfeit of an original. Paintings and drawings made with the hand constitute this first level of simulation. The second order liquifies reality and absorbs appearance. It is based on the commercial law of mechanical reproduction in the age of industrialization. There are two stages of this form of simulacrum: although made with a mechanical device like a film or movie camera, the early stage is still linked to an authentic element. When we watch a movie or look at a photograph, we are viewing a de-auratized object, yet one that is still linked to something genuine and original—like human actors speaking in a living room or watching surfers ride the waves on a beach. In the later stage of this second-order simulacrum, the authentic element has been substituted with a mass-marketed image generated from advertising or film—for instance, in the works of the Pictures Generation or Richard Prince's Marlboro Man. The memory they produce is referred to as prosthetic memory.

The third order of simulation is one in which all the elements share relational significance only between themselves as functioning inside the framework of the model. Fake news and the post-truth society are responses to this third order of simulation. Importantly, the disciplinary society characterizes the first- and second-order simulations, while the society of control characterizes the third order, formed through codification and modulation. In the future the wired brain might be linked up to other wired brains or transactionally to a computational intelligence, so-called Google effect, which constitutes a new form of mediated experience and the source of irreal memory.

I want to suggest that the main differences between these new and future neural technical systems, like BCIs linked to the Internet and those systems that preceded it, are their dependency or lack of dependency upon direct sensual experience. That is to say that telemetric and telepathic media may be delinked from direct sensory experiences that typically conjure episodic memory—those long-term memories that are formed through direct personal experience with the real. Therefore, the memories registered and retrievable in the context of a wired brain may be unearthly, preternatural, and superphysical. I speculate that telemetric and telepathic machinic systems will directly connect to the material brain via implanted electrodes or wearable headsets, leapfrogging sensuality. They will function as the central node in a complex intelligence system or assemblage of relations that consists of the Internet of Everything, virtual reality (VR), and the World Wide Web. In time, this assemblage will become ever-more abundant and necessary as the sophistication and usability of wired brain systems expand, eventually overwhelming all other natural and media systems for access to the material brain and, in the process, making them predominant. I am speculating that telemetric systems will form memories very different from those generated by sensibility and make it possible to experience and

remember multiple fictive pasts and simultaneous existences. Subjectivity will no longer be formed by individual experience in a variable world but by the effects of machinic automaticity tethered to a BCI's and other telemetric devices. Completing a trend that was initiated with photography, cinema, and VR, the mnemotechnic repository—the complete repository of memory stored consciously or unconsciously in the networks of the neural connectome—will be lorded over by an externalized and remote machinic memory of a synthetic connectome. (22) The neural connectome consists of all the connections in the material brain while the synthetic connectome is the entire system of connections created and coded for an artificial brain.

(22) The connectome is the data set describing the connection matrix of the nervous system. It represents the network of anatomical connections linking neural elements across the brain. The synthetic connectome is an artificial construction of the brain's connections used for study.

Speculating upon the political implications of such a technological becoming, I want to suggest that this artificial connectome represents an intersectional relay station between world and brain. They are neither intracranial nor extracranial but compose an intermediate form of situatedness with very different modulating effects. In fact, they will play a role in sculpting the brain's neural plasticity—much like a computer directs a computer numerical controlled (CNC) router or how a 3D printer creates a physical object from a digital model, typically laying down many thin layers of material in succession—except that the template used will be beyond human comprehension and directed by codes and mediated memories alien to humanity. An example of this condition of sublime intelligence became apparent in Google's AI machine AlphaGo, which was able to beat master Go champion Lee Sedol:

> The Google machine repeatedly made rather unorthodox moves that the commentators could quite understand [...] AlphaGo continues its education by playing game after game after game *against itself*. It learns from a vast trove of moves that it generates on its own—not just from human moves. That means it sometimes makes moves no human would. This is what allows it to beat a top human like Lee Sedol. But over the course of an individual game, it can also leave humans scratching their heads. (23)

(23) Cade Metz, "Google's AI Wins Fifth and Final Game Against Go Genius Lee Sedol," *Wired*, March 15, 2016, https://www.wired.com/2016/03/googles-ai-wins-fifth-final-game-go-genius-lee-sedol/.

What are the implications of the above statement for the production of subjectivity and superintelligence? I believe that with neural technologies, a new type of memory based on the hyperreal will emerge—a form of memory that has no direct link to the real and does not follow its rules or regulations; a mediated memory and ostensibly irrational machine mnemotechny alien to human thought and therefore incomprehensible and which leads to a condition that makes self-reflection and contemplation as we now know it impossible. This distinguishes the cognitariat from the superordinate precariat. As we all witnessed in the last US presidential administration, a dependence on the hyperreal, whether it manifests itself as conspiracy theories or fake news, can be devastating to the health of a nation. Superordinate precariats do not know what to believe and don't know that it's a problem.

Neural Technics

According to market research reported by the website Grand View Research, the global BCI market will increase in value from $806.8 million in 2015 to $1.72 billion in 2022, and it is speculated to grow to $6.18 billion by 2030. This increase is the result of applications in

the neuroprosthetic market, which is especially important in facilitating communication and movement in paralytic patients as well as recent applications in virtual gaming, home control systems, and military equipment operations markets. (24) By enlarging the category of the wired brain beyond its telepathic capacities to include a whole bevy of technoceuticals, including BCIs, cortical implants, neural lace, and neural dust, I speculate that this assemblage of technologies will one day constitute a situated machinic interface that oversees the organic cerebral cortex, acting as a relay station interceding with our relation to sensuality. I want to suggest that there is a potential for abuse when information streaming in from an exteriorized intelligent machine overwhelms the information streaming in through one's normal sensory channels, leading to a competitive parallel long-term memory archive. While technoceuticals constitute a category of technological devices that interact directly with the body, neuro-technoceuticals interact directly with the brain's gray matter or the complex communicative system of relays called white matter. For the sake of this essay, I want to concentrate on those new categories of devices that have telepathic possibilities.

Telepathy is defined in the *Cambridge Dictionary* as "the ability to know what is in someone else's mind, or to communicate with someone mentally, without using words or other physical signals" (25); therefore, it can be said to typically involve a receiver and a transmitter of information. It is related to such words and concepts as precognition, psychokinetic, sixth sense, premonition, augury, precognition, telekinesis, and telesthesia. An assortment of new technologies with telepathic potential are already in use, including BCIs—also known as synthetic telepathy interfaces (STIs)—cortical implants, bio-neuro-headsets, and the telepathic smart dust of networked sensor motes. In 2017, Elon Musk announced his latest venture called Neuralink. According to the article "Brain-Computer Interfaces are Coming: 'Consensual Telepathy,' Anyone?" in the *Washington Post*, Musk stated that the main obstacle to optimum human-machine interaction is communication bandwidth. (26) In other words, touchscreens and keyboards are a slow and inefficient means of interacting with a computer, but a faster way would require higher bandwidth. Using neural lace and neural dust, Musk hopes to make consensual telepathy possible for everyone and move the technology of BCIs from their sole use as a medical prosthesis for people with paraplegia to a technology accessible to everyone. Ultimately, this will be the result of a long list of technological nudges aimed at making the cognitariat and, later, the superordinate precariat more efficient laborers in the hope of increasing cognitive surplus value. The superordinate precariat's dominant form of communication, dependent on telepathic devices, will be non-linguistic.

Facebook has also become involved in the telepathy race with its new thought-to-text technologies, which promise to be at least five times as fast as typing on a cell phone and not to interfere with driving. Emotiv is a company producing software that allows users to visualize brain-wave activity in 3D and control drones, robots, and video games. Recently, BCIs have entered the realm of ubiquitous computing and have started to be implemented in military operations in the field. As early as 2010, in an article entitled "Brain-Computer Interfaces: Military, Neurosurgical and Ethical Perspective," Ivan S.

(24) "Brain Computer Interface Market Worth $6.18 Billion By 2030," *Grand View Research*, April 2022, https://www.grandviewresearch.com/press-release/global-brain-computers-interface-market.

(25) See s.v. "telepathy," *Cambridge Online Dictionary*, https://dictionary.cambridge.org/dictionary/english/telepathy.

(26) Edd Gent, "Brain-Computer Interfaces are Coming: 'Consensual Telepathy,' Anyone?," *Washington Post*, June 11, 2017, https://www.washingtonpost.com/national/health-science/brain-computer-interfaces-are-coming-consensual-telepathy-anyone/2017/06/09/9345c682-46ef-11e7-98cd-af64b4fe2dfc_story.html.

Kotchetkov waxed poetic about the applications of BCIs on the battlefield:

> The DARPA division is currently involved in a program called "Silent Talk" that aims to develop user-to-user communication on the battlefield through EEG signals of "intended speech," thereby eliminating the need for any vocalizations or body gestures. Such capabilities will be of particular benefit in reconnaissance and special operation settings, and successful applications of silent speech interfaces have already been reported. (27)

Also of interest for this essay is the recently proposed Smart Living Environmental Auto-Adjustment Control System suggested by Chin-Teng Lin and colleagues in their article "Brain Computer Interface-Based Smart Living Environmental Auto-Adjustment Control System in UPnP Home Networking." (28) Using a modified system akin to BCIs, they were able to make environmental adjustments in a controlled environment demo room by controlled changes in a user's cognitive state.

BCI technologies are sprouting up everywhere, and as they become omnipresent and necessary, their power to transform the material brain will be realized. I have argued elsewhere that this accumulation of telepathic and telemetric devices and their increased uses may follow in the footsteps of reading and writing 5,000 years ago in first colonizing and activating designated neural cognit for telepathy. (29) Stanislas Dehaene refers to this as the "neuronal recycling hypothesis" in describing how cultural initiatives can alter and inhabit cortical maps. (30) Of interest here is the part the brain's neural plasticity and the process of epigenesis play in this evolution of the material brain and their close association with concepts propagated by Stiegler (such as epiphylogenesis, exteriorization, and organogenesis), which I will discuss shortly.

Suturing

> This representational memory [...] disappears with simulation whose operation is nuclear and genetic, and no longer specular and discursive. With it goes all of metaphysics. No more mirror of being and appearances, of the real and its concept. No more imaginary coextensivity: rather, genetic miniaturization is the dimension of simulation. The real is produced from miniaturized units, from matrices, memory banks and command models—and with these it can be reproduced an indefinite number of times. It no longer has to be rational, since it is no longer measured against some ideal or negative instance. It is nothing more than operational. (31)

I wish to posit that the effect of third-order simulation (as described by Jean Baudrillard) produced by this alienated condition of the wired-brain memory bank, which is no longer rational in the human sense and can be reproduced infinitely, produces a very different form of mediation than mediums that predate it, such as cinema and VR. Ontogenetically speaking, the evolution of technology is one of a *progressive* paratactic, a suturing and tuning of the subject to a medium—where each new medium constitutes a stage in an ontogenetic reckoning of an ever more seamless immersion. Successive suturings (according to the logic of the ontogeny of media) create ever more perfectly regis-

(27) Ivan S. Kotchetkov et al., "Brain-Computer Interfaces: Military, Neurosurgical and Ethical Perspective," *Neurosurgical Focus* 28, no. 5 (May 2010): E25, https://doi.org/10.3171/2010.2.FOCUS1027.

(28) Chin-Teng Lin et al., "Brain Computer Interface-Based Smart Living Environmental Auto-Adjustment Control System in UPnP Home Networking," *IEEE Systems Journal* 8, no. 2 (June 2014): 363–70, https://doi.org/10.1109/JSYST.2012.2192756.

(29) Warren Neidich, "Epilogue: Telepathic Exaptation in Late Cognitive Capitalism: A Speculative Approach to the Effects of Digitality," in *Big Data: A New Medium*, ed. Natasha Lushetich (London: Routledge, 2021), 206–21.

(30) Stanislas Dehaene, "Cultural Recycling of Cortical Maps," *Neuron* 56, no. 2 (October 25, 2007): s384–98; Stanislas Dehaene, "Evolution of Cortical Circuits for Reading and Arithmetic: The Neuronal Recycling Hypothesis," in *From Monkey Brain to Human Brain*, ed. Stanislas Dehaene et al. (Cambridge, MA and London: MIT Press, 2015), 134.

(31) Baudrillard, *Simulations*, 9.

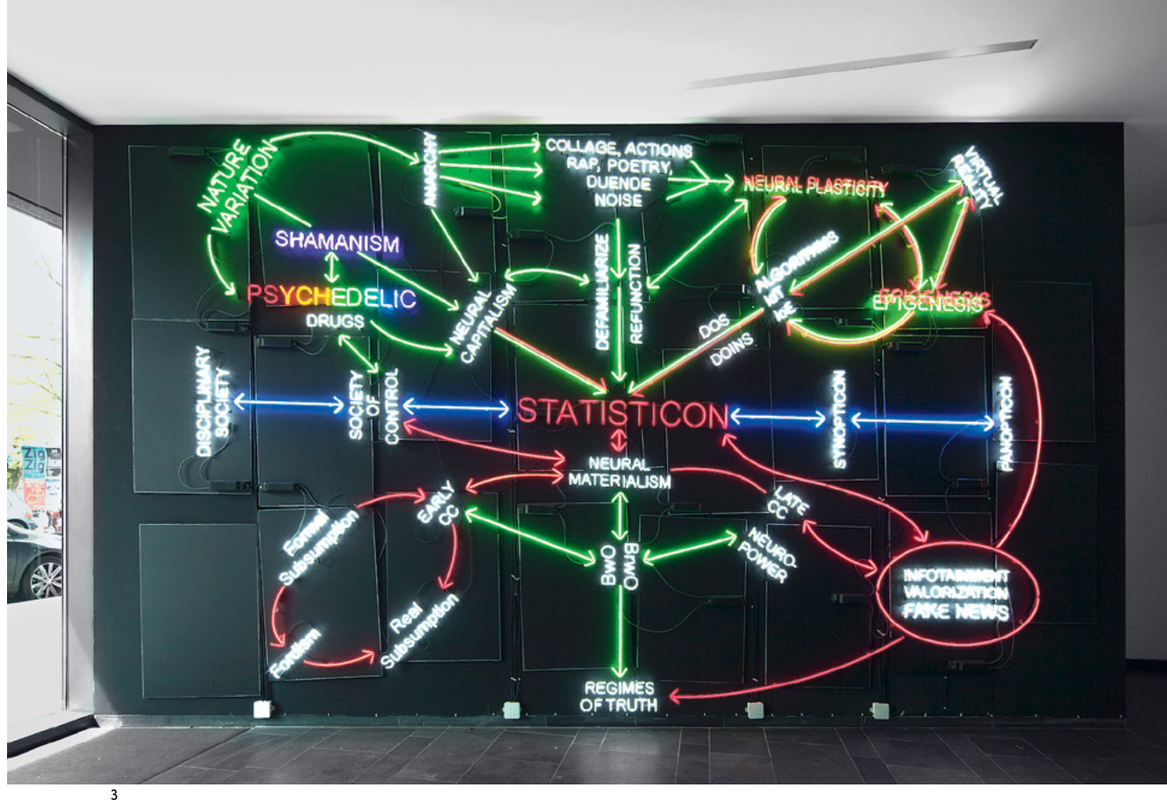

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fig. 3 Warren Neidich, *The Statisticon Neon*, 2017, neon lights on painted wooden boards, 3.5×3 m, Kunstverein Rosa-Luxemburg Platz, Berlin, 2017.

tered systems of maieutics, or mirroring, which I have called cognitive ergonomics. (32)

In his essay "Notes on Suture," Stephen Heath, building on Jean-Pierre Oudart, describes the importance of the subject as a site of absence that passively articulates the relations of the signifying chain of images that comprise the cinematic event. This subjective lack constitutes the ideological significance of the sequence of images and its discursive agency (in a system of relations that join together and constitute the multiplicity of filmic sensibilities) that exist not only in what is obviously available but also in its optical unconscious, especially its imaginary. "Cinema as discourse is the production of the subject and the subject is the point of that production." (33) As such, cinema follows photography and continues its legacy in augmented and VR. The advent of neural-linked media represents the most current form of this mediated immersive suturing, except that the image archive it adjudicates and the image stream it concocts are not things that have been directly witnessed. It is totally transparent, and its production is silent. The subject is unaware it is even happening—almost imperceptibly, it leaves traces of another machinic countenance.

(32) Warren Neidich, *Blow-up: Photography, Cinema and the Brain* (New York: Distributed Art Publishers, 2003).

(33) Stephen Heath, "Dossier Suture: Notes on Suture," *Screen* 18, no. 4 (Winter 1977): 48–76, here 48–47.

Epiphylogenesis, Multiple Superimpositional Exteriorization, and Organogenesis

The formation of the superordinate precariat's subjectivity is a consequence of an internalized mnemotechny constructed through epiphylogenesis, as Bernard Stiegler has described it, in accordance with a third-order simulacrum fabricated in the machine-brain entanglement constituted by BCIs. In *Technics and Time, 1: The Fault of Epimetheus* (*La Technique et le temps, 1: La faute d'Épiméthée*, 1994), Stiegler defines epiphylogenesis as "conservation, accumulation, and sedimentation of successive epigeneses, mutually articulated." (34) Epiphylogenesis is the process through which the phylogeny of the technical species—or the evolution of technical apparatuses over time—is transmitted. Through multiple exteriorizations, human matter becomes entangled with technics or organized inorganic matter.

In his essay on Stiegler and the "industrialization of memory," Ben Roberts describes this "new process of exteriorization whereby the 'interior' of the living being becomes inextricably bound up with an 'exterior' realm of tools." (35) Therefore, the history of the human is no longer in the realm of genetic evolution but in that of technical evolution (or the evolution of "organized inorganic beings"), in which it is impossible to separate the living being from its external prosthetic technical support. Stiegler distinguishes this technical evolution from biological evolution (phylogenesis) by calling it epiphylogenesis. In recent texts such as the *Nanjing Lectures,* Stiegler uses the term "exosomatic organogenesis" to distinguish the concept from endosomatic organogenesis, the result of natural selection on the genome. (36)

(34) Bernard Stiegler, *Technics and Time,* vol. 1, *The Fault of Epimetheus* (Stanford: Stanford University Press, 1998), 140.

(35) Ben Roberts, "Cinema as Mnemotechnics: Bernard Stiegler and the 'Industrialization of Memory,'" *Angelaki* 11, no. 1 (2006): 55–63, here 56.

(36) Stiegler, *Nanjing Lectures*, 301.

Neural Epiphylogenesis: Technicity and Selective Stabilization

There is no better place to understand the effects of this process of epiphylogenesis than in the brain. I want to digress somewhat to explain how the multiplicity of synaptic events occurring throughout the variable nervous system can open a doorway to understanding the ways and means by which technics participate in changing the brain's architecture. Epigenesis is a term that leaps from its original understanding in the realm of genetics to describe the unveiling of latent chunks of DNA through demethylation and histone displacement as a response to environmental conditions. One example is the sequence of events that constitute the process of carcinogenesis, which occurs when a carcinogenic agent or radiation induces a change in the DNA of a single cell, leading to an enhanced reproductive cascade of mutated cells and tumor formation. Important for us here is its other definition emanating from the field of neurobiology, where is linked to what Jean-Francois Changeux refers to as "epigenetic synaptogenesis"—a process through which labile or unstable synapses are pruned. (37)

According to Peter Huttenlocher in "Morphometric Study of Human Cerebral Cortex Development," the process of synapse formation, or synaptogenesis, begins to flourish in the embryo at around twenty-three weeks of gestation and peaks in the early postnatal period. (38) Although this continues throughout life, there are critical periods characterized by massive overproduction or transient exuberance throughout the cerebral cortex. However, the production is asymmetric, appearing early in the sensory cortices such as the visual cortex, where it occurs between four to eight months, and peaking in the frontal gyrus around twelve to fifteen months. As a result of the pruning of synapses understimulated by the environment, the adult brain contains 40 percent fewer synapses than the infant cortex. Many of these synapses are labile, their function unspecified, and they are electrically silent as they have yet to be incorporated into networks or cognits. According to Changeux, regularly occurring, pervasive, and powerfully stimulating environmental inputs transform these synapses into functioning units. He states that "the epigenetic selection of synapses represents learning in the network as the organism is shaped to fit its environment. In this sense, learning can be considered as a Darwinian process, because it depends on elimination of the 'unfit' synapses." (39) Furthermore, according to Marc Jeannerod, "If a synapse belongs to a circuit in frequent use, it tends to grow in volume, its permeability increases and its efficacy increases. Inversely, little used synapses tend to become less efficacious" (40) and are pruned or die off. Thus, stimulated synapses are selected, while those that are not are eliminated. Over time, the result is a finely tuned neural architecture in sync with the socio-cultural-technologically induced environment.

Populations of neural synaptic junctions are molded by the pressure imposed by the conditions of technicity, especially their formatting of the distributions of sensibility—which includes the power of new kinds of images and how these images affect the gaze and gather attention. Drawing on André Leroi-Gourhan, Stiegler considers this connection between tool and brain development in his discussion of exteriorization in *Technics and Time, 1: The Fault of Epimetheus*. (41) Stiegler introduces the link between the material culture of tool evolution and the material evolution of the brain's gray matter when speaking about the evolution of Zinjanthropus to Neanderthal:

> We submit that between these two ruptures, cortex and equipment are differentiated together, in one and the same movement. The issue is that of a singular process of structural coupling in exteriorization that we are calling an

(37) Jean-François Changeux, "Selective Stabilization of Developing Synapses as a Mechanism for the Specification of Neuronal Networks," *Nature* 264 (December 1976): 705–12.

(38) Peter Huttenlocher, "Morphometric Study of Human Cerebral Cortex Development," *Neuropsychologia* 28, no. 6 (1990): 517–27.

(39) Jean-Pierre Changeux, "Synaptic Epigenesis and the Evolution of Higher Brain Functions," in *Epigenetics, Brain and Behavior: Research and Perspectives in Neurosciences*, ed. Paolo Sassone-Corsi and Yves Christen (Berlin and Heidelberg: Springer, 2012), 11–22, here 12.

(40) Marc Jeannerod, foreword to Catherine Malabou, *What Should We Do with Our Brain?*, trans. Sebastian Rand (New York: Fordham University Press, 2008), xi–xiv, here xii.

(41) Stiegler, *Technics and Time*, vol. 1, 142.

> instrumental maieutics, a "mirror proto-stage" in the course of which the differentiation of the cortex is determined by the tool just as much as that of the tool by the cortex: a mirror effect whereby one, looking at itself in the other, is both deformed and formed in the process [*l'un se regardant dans l'autre qui le déforme s'y forme*]. (42)

(42) Stiegler, *Technics and Time*, vol. 1, 158.

My point is that this process continues today with the acceleration of digitality, especially the coming saturation of the digital field with telemetric devices that constitute the wired brain. Will these new technics constitute the future cortical architecture of the brain and lead to its further evolution and expansion, as did technological advances in the past? Are these technologies inducing changes between Internet natives and immigrants or between the cognitariat and the superordinate precariat that we qualitatively recognize? Recent research in neurobiology has pointed to the effects of BCIs in stimulating neural plasticity. In their article "Immediate Brain Plasticity After One Hour of Brain-Computer Interface," Till Nierhaus and colleagues found "rapid and spatially specific signs of brain plasticity measured with functional and structural MRI after only 1 h of purely mental BCI training in BCI-naive subjects." (43) Could this be the beginning of other alternative uses of BCIs beyond telepathy, of sculpting the neural architecture through its neural plasticity? Imagine, then, the scenario of an AI-directed algorithmic entity in charge of this process.

(43) Till Nierhaus et al., "Immediate Brain Plasticity After One Hour of Brain-Computer Interface," *Journal of Physiology* 599, no. 9 (May 2021): 2435–51, here 2435.

Three Orders of Simulation: Formatting Authentic, Prosthetic, and Irreal Memory

I now want to sketch three forms of media-induced memory based on Baudrillard's schema of the simulacrum. (44) I am proposing that the mutation of the cognitariat to the superordinate precariat is based on their relationship to technics generating simulacra and the character of memory thus induced. These categories are (1) Authentic, (2) Prosthetic: Cinematic-Virtual, and (3) Simulated.

(44) Jean Baudrillard, *Simulacra and Simulation*, trans. Sheila Faria Glaser (Ann Arbor: University of Michigan Press, 1994).

In *Simulacra and Simulation* (*Simulacres et Simulation*, 1981), Baudrillard identifies three orders of simulacra. The first-order simulacrum is unmistakably a copy of the original or a forgery. The representation is clearly a handcrafted placeholder for a real item, and the resulting memory is thus referred to as authentic. There is no difficulty distinguishing the two; both can be easily and separately called up by working memory in the mind's eye, where they remain discernable in what Deleuze calls the "image of thought." (45) The second order is associated with the Industrial Revolution and marks the moment the relationship between reality and representation begins to break down owing to the mass production of copies and their subsequent commodification. This process of commodification threatens the authority of the original as the image/copy becomes an equal or even better placeholder for the real. While the first-order simulacrum focuses on "real" counterfeits, the second order is associated with production and prosthetic memory not derived from the person's real experience. The third order is a product of late capitalism or postmodernism as the distinction between reality and representation disappears. The sign pretends to be a faithful copy but does not actually refer to an original.

(45) See Deleuze and Guattari, *A Thousand Plateaus*.

I am speculating that each order of simulation is delineated with a specific form of memory. The degree of simulation expands as we move from its initiation in the Renaissance through its further enunciation in industrial capitalism to its expression in early- and late-stage cognitive capitalism; it mirrors its degree of immersion mentioned previously. In late-stage cognitive capitalism, the material brain becomes the site of commodification and privatization. That is, the "real" of authentic memory constituted by the image of nature transferred to paper or canvas is substituted by the dynamic images in movement and time of cinema and VR—images that lack an aura. These are characteristic of industrial capitalism and produce prosthetic memories. According to Alison Landsberg in her book *Prosthetic Memory: The Transformation of American Remembrance in the Age of Mass Culture* (2004), prosthetic memories "are not strictly derived from a person's lived experience [...] but are derived from engagement with a mediated representation." Furthermore, they "circulate publicly, and although they are not organically based, they are nevertheless experiences with a person's body as a result of an engagement with a wide range of cultural technologies all vying for limited memory space." (46) Prosthetic memories are phatic, generated from the word "emphatic." As Paul Virilio states,

> The phatic image—a targeted image which forces you to look and holds your attention—is not only a pure product of photographic and cinematic focusing. More importantly it is the result of an ever-brighter illumination, of the intensity of its definition, singling out only specific areas, the context mostly disappearing into a blur. (47)

(46) Alison Landsberg, *Prosthetic Memory: The Transformation of American Remembrance in the Age of Mass Culture* (New York: Columbia University Press, 2004), 33.

(47) Paul Virilio, *The Vision Machine* (Bloomington: Indiana University Press, 1994), 14.

Thus, these artificially contrived images compete more effectively for neural space than their natural or organic counterparts and build sets of neural relationships or neural networks that are, in a sense, artificial. In an article in *MIT News* entitled "Study: On Twitter, false news travels faster than true stories," Sinan Aral, a professor at the MIT Sloan School of Management and co-author of a new paper detailing the findings states, "we found that falsehood diffuses significantly farther, faster, deeper, and more broadly than the truth, in all categories of information, and in many cases by an order of magnitude. [...] These findings shed new light on fundamental aspects of our online communication ecosystem." (48)

(48) Sinan Aral quoted in Peter Dizikes, "Study: On Twitter, False News Travels Faster than True Stories," *MIT News*, March 8, 2018, https://news.mit.edu/ 2018/study-twitter-false-news-travels-faster-true-stories-0308.

In other words, the second-order simulacrum and the kind of memory it enlists through cinema and VR generate short- and long-term memories in the brain, which become essential to producing the image of thought in the mind's eye and working memory. There are qualitative differences between the prosthetic memory created by cinema and that created by VR. Since cinema is normally watched from a theater chair, the memories created are more related to receptive perception and are gestalt heavy, whereas those of VR are more haptic and, therefore, more affordance heavy. They are both very engaging and therefore easily remembered, but they are only captured during the apportioned time of the passive cinematic experience or the interactive time immersed in the virtual environment. Therefore, they only make up a small fraction of the long-term memory store. They share the internal memory landscape with authentic memories. In scenario visualization, in which working memory calls up memories from the brain's memory archive to generate a story or pre-visualize a scene, both authentic memories and prosthetic memories are intertwined and vie for inner attention or salience.

In late-stage cognitive capitalism, working memory has become the focus of new forms of political power and mentalité. The alienation of the Fordist subject is the result of the bricolage of these different concoctions of hybrid memory, and their schism, their incapacity to be clearly superimposed, results in the psychotic breakdown of the photographer Thomas (played by David Hemmings) at the end of Michelangelo Antonioni's 1966 film *Blow-Up*. His mental disintegration is a result of the irresolution of two competing memory systems, one real and the other photographically produced, simultaneously vying for attention and consciousness, neither of which can win the day.

Third-order simulacra are a product of postmodernism and late capitalism and are identifiable by their capacity to precede the original, blurring the distinction between reality and representation. The third-order simulacrum is composed of a network of signifiers divorced from reality. The sign pretends to be an accurate copy but, in fact, does not refer to an original. Here the simulacrum precedes the real in an act of pretension. In *Simulacra and Simulation*, Baudrillard states, "Simulation is no longer that of a territory, a referential being, or a substance. It is the generation by models of a real without origin or reality: a hyperreal. The territory no longer precedes the map, nor does it survive it. It is nevertheless the map that precedes the territory." (49)

We live in an environment of counterfeit production of both static and dynamic images generated by mass media in the form of advertisements appearing in designed spaces and on the World Wide Web. In cognitive capitalism, this hyperreality primarily operates upon the performative imagination, and the artificial signs that compose it owe their allegiance only to each other, released as they are from the truth and circulating together in an atmosphere of the irrational. Irreal memory is constituted by this third-order simulation and, like prosthetic memory, colonizes the memory archive with non-experiential fabricated memories generated by what we would consider to be a machinic intelligence coded by machines with no human intervention. However, in this case, there are no authentic memories with which to compete as there was in prosthetic memory, and the phatic memories of virtual memory subsume all other forms of memory in the neurobiological archive. Even though the hybrid memories of the Fordist and post-Fordist subject can cause a schism and rupture of the psyche, there is still a connection to the real signified. This connection disappears in irreal memory. It constitutes a total disconnection. There is a direct link between the mediated memory of the computational power of the BCI and the intracranial brain's archive. The two are hyperlinked.

(49) Baudrillard, *Simulacra and Simulation*, 1.

Telepathy

The final characteristic of the superordinate precariat is the acquisition of the capacity for non-assisted telepathy through the development of a dedicated module resulting from the superabundance and accumulation of machine-assisted technically mediated telemetry over time. I have suggested in my essay "Epilogue: Telepathic Exception in Late Cognitive Capitalism" that, in a process like the one formulated by Dehaene in 2015—referred to as the neuronal recycling hypothesis, which suggested the means through which a dedicated module for reading and writing emerged in the ventral occipitotemporal cortex in macaques—a dedicated module for telepathy might develop in an, as yet, unknown area of the cerebral cortex. (50) The macaque's ventral occipitotemporal cortex has neurons that contain an elementary stock of shapes and forms necessary for coding objects. Some neurons in this area even respond to line junctions resembling our letter shapes. In humans, this area is now called the visual word form area (VWFA) of the temporal lobe. According to Dehaene, it emerged due to the repurposing of this area in the fusiform gyrus. (51) This repurposing resulted from an abundance and accumulation of written materials and the selective pressures they imposed on the neuroplastic material brain in the years following the invention of cuneiform writing. In *The Symbolic Species* (1998), Terrence Deacon describes this accumulation in the following way, "once symbolic communication became even slightly elaborated in early hominid societies, its unique representation functions and open-ended flexibility would have led to its use for innumerable purposes with equally powerful reproductive consequences." (52) I am speculating that, like writing and reading, telepathy will manifest as a dominant technology, changing the world and the human brain. The brain's evolution continues to change as it did two million years ago. Here, we must return to Stiegler's concept of a coupling in one and the same movement or an instrumental maieutics. I am suggesting that the pressures of this telepathic and telematic environment will induce two ruptures, one in the cortex and the other in equipment and that the two are differentiated together in the same spiraling movement. Incremental changes in one induce changes in the other and vice versa ad infinitum. This process is what Stiegler calls "instrumental maieutics," in which tool differentiation is entangled with cortical differentiation of the brain. A process of forming and deforming occurs along the continuum of the intracranial-extracranial complex or continuum. I want to suggest that the process of exosomatic organogenesis at play is a form of resistance to the stultifying effects of the normalizing digital dominion, creating a way out. For me, this is the freedom and power that defines the indeterminate becoming brain.

(50) Warren Neidich, "Epilogue: Telepathic Exception in Late Cognitive Capitalism," in *Big Data: A New Medium*, ed. Natasha Lushetich (London: Routledge, 2020), 208.

(51) Dehaene, "Cultural Recycling of Cortical Maps," 384–98.

(52) Terrence Deacon, *The Symbolic Species: The Co-Evolution of Language and the Brain* (New York: W. W. Norton & Company, 1998), 349.

Conclusion

In late cognitive capitalism, a further eruption will occur that does not require the sensuous body at all and, in fact, bypasses sensibility altogether. It will depend on the new technologies of neural capitalism, especially advanced versions, such as telepathic and telemetric devices, like BCIs. The media of the BCI will create a third-order simulacrum of the *whatever-whenever* in the material brain. The screen will disappear, and instead of clicks and typing, interacting atmospheres of collective and synchronous neural oscillations will register the precariat's mental choices as data with an embedded systemic machinic processor existing as a platform on the World Wide Web. Conversely, a battery of codes based on patterns thus registered and collated will be fed back, modulating streams of consciousness. A new kind of "Google bubble" will be created, leading to neural subsumption. This condition represents a crisis of the imagination, which is described (following Nelson Goodman) by the idea of irreality. (53) The irreal is a digital and fractalized imagination operating as a pure simulation of the transcendental and empirical. It is the whatever and

(53) Nelson Goodman, *Ways of Worldmaking* (Indianapolis, IN: Hackett, 1978).

whenever of advanced simulation technologies and creates immersive irreal memories. The political consequence of the irreal is the full-blown collapse of the freedom of choice for an already debilitated and proletarianized superordinate precariat a condition I am calling "memory disconnection syndrome." On the other hand, the brain and mind possess forms of resistance because of the variation that forms the basis of its neural plastic potential. In the midst of this precarity new modules of mental proficiency, like telepathy with capacity for poetic dissonance, counter the power arising in the face of new technologically induced forms of despotism.

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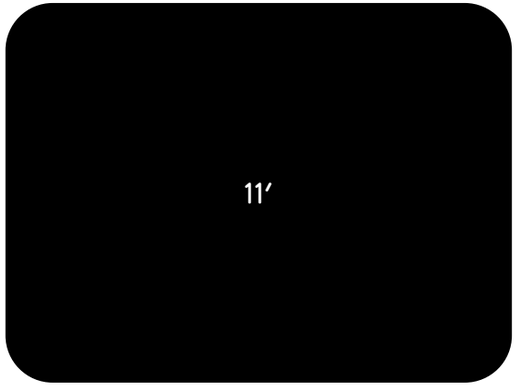


Strange Machines
Some Things between Art and Biology

Hannes Rickli

As a visual artist, I am interested in processes on the margins of what can be perceived and represented—and also in the things that are capable of directing these processes invisibly and yet effectively. In the course of comprehensive digitalization, the invisibility of such things is constantly increasing, making technical operations necessary in order to bring their modes of action into the range of the aesthetic. Posing questions about the quality and materiality of the relations between human and non-human actors seems all the more urgent as these interactions increasingly dissipate into machines and black boxes. The nascent presence of immaterial communication technologies like the online videotext service Minitel in the early 1980s prompted philosopher Jean-François Lyotard to fundamentally rethink the modern conception of materiality. (1) The immaterial or "immaterials" (*les immatériaux*), as he called the new substances, and the way they interact with other things, would constitute the materials of the postmodern age. (2) To handle such materialities (aesthetically), he explicitly addressed the arts. Art, according to Lyotard, "consists in exploring things unsayable and things invisible. Strange machines are assembled, where what we didn't have the idea of saying or the matter to feel can make itself heard and experienced." (3)

The things which I have encountered in laboratories of the life sciences would presumably be designated by the philosopher Michel Serres as "quasi-objects." In experimental systems they order and direct the relations between humans, animals, media, and apparatus, which work together to produce knowledge or come into conflict with each other, while they also structure the spatial, temporal, and social dimensions of research processes. Serres describes their condition as changeable and not always clearly recognizable: "There are objects to do so, quasi-objects, quasi-subjects; we don't know whether they are beings or relations, tatters of beings or end of relations." (4) A quasi-object, he continues, is "there only to be circulated. It is rigorously the transubstantiation of being into relation." (5) The quasi-object "makes" the collective, it brings it forth and organizes it. Yet it is "blank" and "tends toward zero, tends toward absence, in a black collective." (6)

In the context of biological experimental systems, science historian Hans-Jörg Rheinberger distinguishes between "epistemic things" and "technical objects," which contribute equally to driving the process of research. While the "epistemic thing" is the substrate of the desire for scientific insight, "technical objects" are there to make

(1)
In the context of the exhibition *Les Immatériaux* at the Centre Georges Pompidou in 1985, curated by Jean-François Lyotard with Thierry Chaput.

(2)
See on this topic, Yuk Hui, "Einige Fragen, das Verhältnis von Materie und Relation betreffend," *Zeitschrift für Medienwissenschaft* 7, no. 1 (2015): 165–70, https://doi.org/10.25969/mediarep/1495; and *30 Years after "Les Immatériaux": Art, Science, and Theory*, ed. Yuk Hui and Andreas Broeckmann (Lüneburg: meson press, 2015), https://doi.org/10.14619/002.

(3)
Jean-François Lyotard, "Philosophy and Painting in the Age of Their Experimentation: Contribution to an Idea of Postmodernity," in: *The Lyotard Reader*, ed. Andrew E. Benjamin (Oxford: Blackwell, 1989), 181–95, here 190.

(4)
Michel Serres, "Theory of the Quasi-Object," in *The Parasite*, trans. Lawrence R. Schehr (Baltimore, MD: Johns Hopkins University Press, 1982), 224–34, here 227.

(5)
Serres, "Theory of the Quasi-Object," 228.

(6)
Serres, "Theory of the Quasi-Object," 234.

the phenomena at focus measurable. (7) Rheinberger describes this change in cognitive interest as the shift from the "epistemic thing" to the "technical objects," in which infrastructure and its surroundings become the object of study. In this process interests swing back and forth like a pendulum between the one thing and the other, with infrastructures binding the bulk of the resources for undertaking research.

In the context of my artistic laboratory studies, I use the term "infrastructure" for these special instruments of organization, to point out that technical ensembles outside of the laboratories are just as pervasive in our everyday lives. Infrastructure normally lies below our perception threshold and "is considered to be a hidden substrate—the binding medium or current between objects of positive consequence, shape, and law," as the architect and city planner Keller Easterling elaborates. (8) They become visible only when they break down, and then, departing from their intended operating modes, they reveal chaotic dynamics. (9)

The object of my aesthetic research is the use of electronic media and infrastructures for the generation and circulation of data within three biological working groups that investigate the behavior of fish and insects. To observe the data work of the biologists, for more than ten years, my team has been developing its own "strange machines" and translating the results into audiovisual art installations. (10) The spatial artistic installations are conceptualized to make perceivable how not only scientific, but also artistic experimentation is pervaded by and characterized by the standards and norms of electricity, the computer industry, and by the Internet and its global transmission structures.

The five sections of the essay follow the tracks of technical and cultural imprinting by presenting examples from my artistic confrontation with media infrastructures: The Line, Paris 1893; The Virtual Environment, Zurich 2006/08; The Submarine Cable, Spitsbergen 2012–21; The Pipeline, Texas 2014; The 19-Inch Rack, Zurich 2020.

The Line, Paris 1893

Around 1890, Étienne-Jules Marey had a series of animals pass by a camera in his Paris institute *Station physiologique* in order to study their gait. The passages took place from left to right in front of a wall about ten-meters long, which appears in the photograph as neutral gray; white-and-black strips in the foreground mark one-meter intervals. His series of three experiments was entitled *Âne, Marche* (Walk, Donkey) and dated to the year 1893 (fig. 1). In the first sequence, composed of twenty-six individual images, a donkey on a loose line is led by an assistant through the elongated image format. The second round portrays the donkey trotting. For the third sequence, the donkey was supposed to gallop. For this a clock with a second hand was installed in front of the wall, which was activated as soon as recording started. This time the test animal balks; after a strong tug on the line by the assistant, it breaks out toward the camera. The assistant struggles to steer the animal past the camera. Whether the animal's lack of motivation was triggered by a disturbance in its surroundings or simply conformed to the proverbial character of the donkey cannot be determined from the photographic record.

The recordings appear to be the distant echo of a setting that has hardly any similarity to contemporary, technology-based, and

(7)
"It is through [technical objects] that the objects of investigation become entrenched and articulate themselves in a wider field of epistemic practices and material cultures, including instruments, inscription devices, model organisms, and the floating theorems or boundary concepts attached to them. It is through these technical conditions that the institutional context passes down to the bench work in terms of local measuring facilities, supply of materials, laboratory animals, research traditions, and accumulated skills carried on by long-term technical personnel. [...] The experimental conditions 'contain' the scientific objects in the double sense of this expression: they embed them, and through that very embracement, they restrict and constrain them." Hans-Jörg Rheinberger, *Toward a History of Epistemic Things: Synthesizing Proteins in the Test Tube* (Stanford, CA: Stanford University Press, 1997), 29.

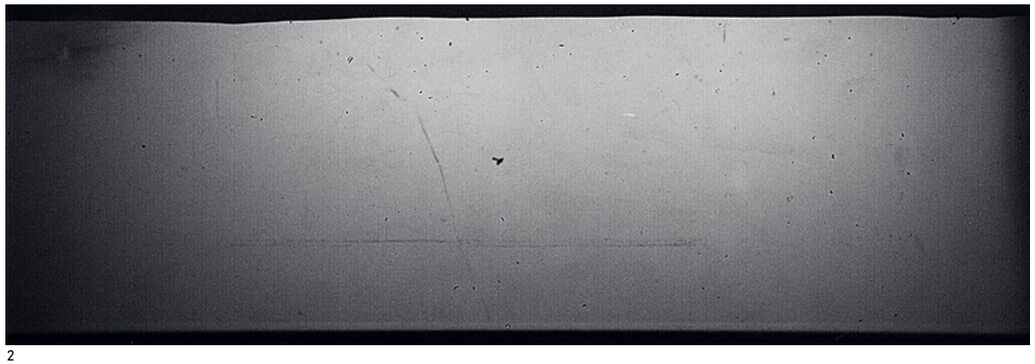
(8)
Keller Easterling, *Extrastatecraft: The Power of Infrastructure Space* (London: Verso, 2014), 11.

(9)
See Jane Bennett, "The Blackout," in *Vibrant Matter: A Political Ecology of Things* (London and Durham, NC: Duke University Press, 2010), 24–28.

(10)
Staff: Valentina Vuksic, computer artist and programmer (audio); Christoph Stähli, artist (3D displays); Birk Weiberg, art historian (video).

1

fig. 1 Etienne-Jules Marey and Georges Demenÿ, "Âne, Marche," 1893, Station physiologique, Paris.



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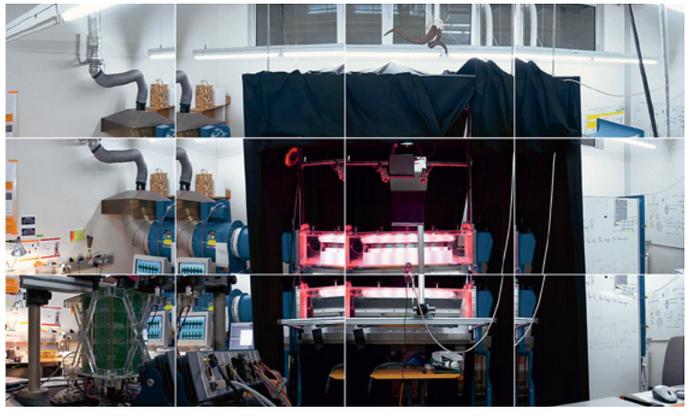


3

fig. 2 Drosophila in a wind tunnel, high-speed recording, 2006. Bitmap image: Steven N. Fry.

fig. 3 Wind channel, experimental system by Steven N. Fry at the Institute of Neuroinformatics at University of Zurich / ETH, 2008. Video stills from the three-channel video installation "Labscan #1, Schwarzbäuchige Fruchtfliege," Roland Keller / Hannes Rickli.

data-driven research. In their raw, elementary state, they do, however, contain essential elements and patterns upon which certain forms of animal observation and measurement are still based today. The series of images demonstrate an experimental system that consists of a batch of human and non-human components in spatiotemporal arrangements. The arena, the animal, the assistant, the line, the measuring scale, the clock, the camera, and finally, the tracks of the experimental actions recorded on the photographic plates, are all motifs that have become differentiated over the course of time. The line in Marey's experiment points to a fundamental principle of technologically based behavioral research, which consists in constant reconciliation—a mutual adaptation and reconfiguration of the actors—in order to register behavior as "natural" as possible under laboratory conditions. (11) In my laboratory examples around the turn of the millennium, the donkey's line is refined and dematerialized into the form of a virtual environment in which the experimental animals orient themselves.

The Virtual Environment, Zurich 2006/08

Over a century after Marey's recordings, in 2006 Steven N. Fry recorded images of fruit flies flying freely at the Institute of Neuroinformatics, University of Zurich and ETH (fig. 2). The experimental design and the interest in biomechanics were similar to the experiments in Paris, but the line used to guide the animals and the assistant was replaced by a virtual environment controlled by the flies themselves. Moving from left to right, a Drosophila crosses the visual space in a widescreen format. The lateral high-speed recordings (1,000 fps) were made in the wind channel shown here (fig. 3).(12) They come from the preliminary phase of the experiment during the calibration of the recording system. The experiment investigated how the fruit fly correlates the neurons in its motor system and optical system during flight maneuvers. To simulate the start of flight, images of the wing positions and changes in the body axis were evaluated in the few milliseconds when the animal accelerated like a helicopter. For this Fry used what is called the "preferred flight speed," (13) a property with which the fly visually orients itself to its environment during flight. Once the experimental animal, lured by the smell of vinegar, flew into the flight space on its own, a 3D tracking system recorded its position. A graphical pattern projected onto the side walls of the wind tunnel was presented at flexible speeds in order to direct the fly to the center of the image. Once it reached this point, the pattern suddenly accelerated, causing the fly to execute the planned maneuver.

During the experiment, an algorithm translated detailed images of the wings and the bodies from thousands of insect flights into numeric values, and simultaneously deleted the image data to prevent any transmission delays caused by the saving of the voluminous visual data during the projection of the visual pattern on the channel walls. Far down in Fry's data storage there is thus a subfolder labeled "first test 2006," which contains just a few film images of the "queen of genetics" controlled by an invisible force. (14)

The Submarine Cable, Spitsbergen 2012–21

Since summer 2012 the underwater observatory *RemOs1* (Remote Optical System) has been photographing the end of a broken pier on the

(11) On this, see also Christoph Hoffmann, "Beings with Lifeworlds of their Own in Scientific Experiments," in *Videograms: The Pictorial Worlds of Biological Experimentation as an Object of Art and Theory*, ed. Hannes Rickli (Zurich: Scheidegger & Spiess, 2011), 17–22, https://doi.org/10.5281/zenodo.5639385.

(12) The art project developed its own recording system for the 360 degree images. A video camera rotated horizontally around its own axis every 5 minutes. The images recorded on 3 levels were synchronized afterward. See also Rickli, *Videograms*.

(13) See, e.g., Steven N. Fry et al., "Visual Control of Flight Speed in *Drosophila melanogaster*," *Journal of Experimental Biology* 212, no. 8 (2009): 1120–30, here 1121, https://doi.org/10.1242/jeb.020768.

(14) On representing the Drosophila as a film star, see Vinzenz Hediger, "Data Trash to Art: A Note on Hannes Rickli's Installation *Drosophila Melanogaster* (2008) and Tacit Cinematic Knowledge," https://www.journals.uchicago.edu/doi/suppl/10.1086/714823/suppl_file/AppendixS2.pdf, supplementary essay to Anja Sattelmacher, Mario Schulze, and Sarine Waltenspül, "Introduction: Reusing Research Film and the Institute for Scientific Film," *Isis* 112, no. 2 (June 2021): 291–98, https://doi.org/10.1086/714823.

coast of Ny-Ålesund, Spitsbergen, Norway. Built as a landing place for coal transport ships, the pier has been derelict since its coal mine was closed after serious mining accidents in 1963 and was demolished in 2011. The newly created structure is used by the working group led by Philipp Fischer (15) to investigate the impact of ocean warming as a result of climate change. Water temperatures at the North Pole are rising around ten times faster than at the equator (+ 0.1°/year) and are influencing the ecology of habitats. The population of the substrate is changing as organisms that previously lived in warmer ocean regions are displacing original pioneers.

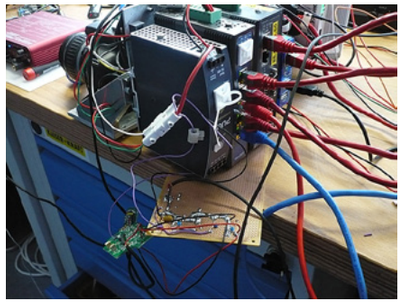
The *RemOs1* automatically takes a pair of stereometric images with two slightly offset horizontal cameras every half hour, even during the polar night in winter. From these images, the researchers use a program to deduce the species and the number and size of the specimens and process the calculated values in diagrams. The observatory is controlled remotely via the blue cable connected to an electrical socket permanently mounted on the ocean floor (fig. 7). It supplies electricity to the device, while simultaneously transmitting the collected data to Helgoland, Germany and to Zurich via submarine and terrestrial cables.

To observe the processes taking place inside the *RemOs1* and its immediate vicinity, the art project implanted small audio pickups into the station in the form of induction coils and contact microphones: effectively, parasites that "stalk" the system's electronic and mechanical activities. This allows us to "listen" to the biological data work from the devices' perspective—the power supply, the cameras, and the on-board computer while they are idle, during the moments when the photographs are taken, and as they compress the image data for transmission over the Internet (figs. 4–5).(16)

Art reverses the direction of the scientific work: while biologists isolate their phenomena from the complexity of the environment and translate them into stable sequences of numbers in order to make them easier to transport, art makes perceptible the unheard noise caused by the electronic data work and its devices, and also the vibrations to which the measurement apparatus is subjected in the current, in heavy seas, storms, or collisions with icebergs. The work of cleansing and abstracting in science is countered in art by reinserting the contaminated materials and the chaotic conditions in the environment where they are produced. These aspects become visible in the archive of data from Spitsbergen, which by now contains circa 300,000 stereometric raw images, before processing by scientists. In exhibitions we install the entirety of the images in this collection in the art space, even the lost frames and data gaps (fig. 6). In these visual traces we can detect the interactions of the measurement device with the various forces in its environment that contribute to the research: bioactivity (the increasingly green tint to the images as ever more algae settle on the viewing window of the research device) (figs. 8–9), electricity (black series of images due to short circuits caused by corrosion, collisions with icebergs or bioactivity), as well as the current weather conditions (the stronger seas and the current swirl up *marine snow* made up of organic particles and microplastic, the brighter the images) (fig. 10).

(15)
"Coastal Observing System for Northern and Arctic Seas," Biological Institute Helgoland, Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung, https://www.awi.de/en/expedition/observatories/water-cosyna.html.

(16)
Audio samples available on the research project's website "RemOs1, Spitsbergen (since 2012)," *Computer Signals: Art and Biology in the Age of Digital Experimentation*, https://computersignale.zhdk.ch/en/data/remos1.



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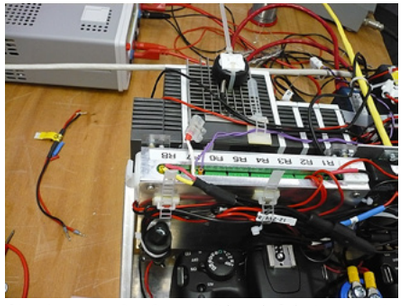

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fig. 4 RemOs1, circuit board of electromagnetic sensor of power consumption, with preamplifier, March 12, 2012. Photo: Hannes Rickli.
fig. 5 RemOs1, electromagnetic sensor of on-board computer (fixed with cable ties to the housing above the center of the picture), March 13, 2012. Photo: Hannes Rickli.

fig. 6 Sketch for an exhibition project at Kunsthalle Bremerhaven, Germany, 2022, wall installation "Archiv RemOs1, Stereometriebilder 2012–20," LED display, audio: livestream of electromagnetic signals of power supply, camera and on-board computer, October 2019. Visualization: Roli Deluxe.

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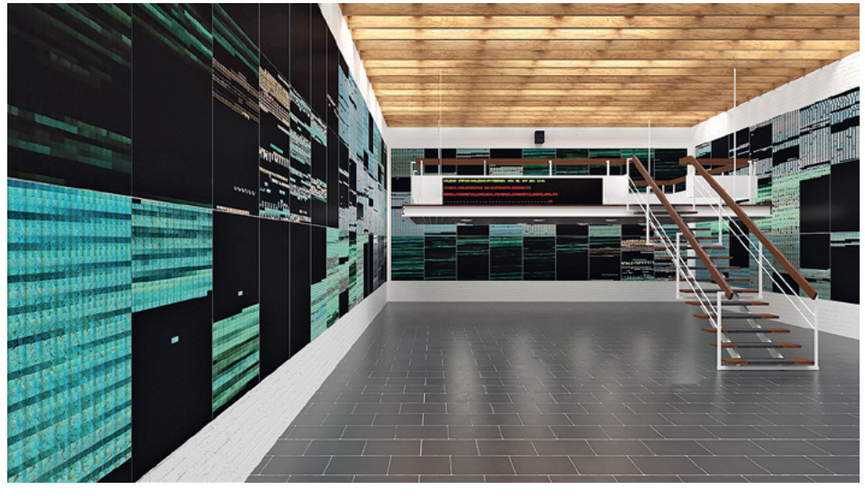

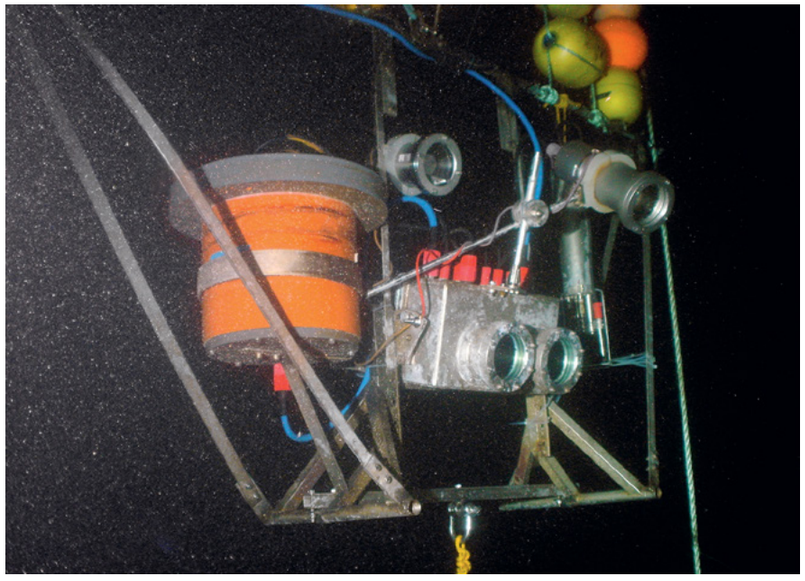

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fig. 7 RemOs1, Kongsfjorden, Ny-Ålesund, Spitsbergen, Norway, March 9, 2013. Photo: Philipp Fischer.
fig. 8 RemOs1, viewing windows of stereometric cameras, June 25, 2013. Photo: Philipp Fischer.

9

8

fig. 9 RemOs1, Kongsfjorden, Ny-Ålesund, Spitsbergen, Norway, June 24, 2013. Photo: Philipp Fischer.
fig. 10 RemOs1, plugs of electrical and data cables, plus bristle worm tubes on the main housing of the observatory, June 25, 2013. Photo: Philipp Fischer.

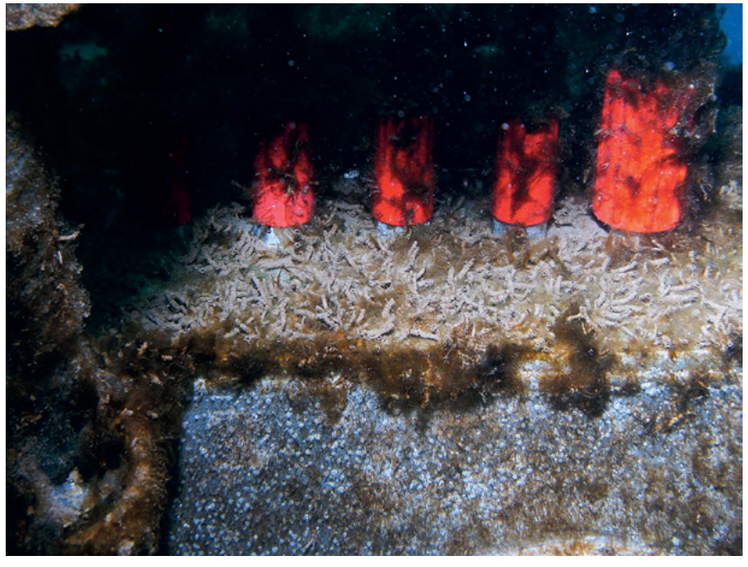

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fig. 11 Rig 641, University Street, Crane County (Odessa), Texas, August 21, 2014. Video still: Birk Weiberg.

The Pipeline, Texas 2014

At the University of Texas in Austin, Hans Hofmann investigates the genetic evolution of social behavior in African cichlids. (17) Similar to Philipp Fischer's long-term *remote sensing* project in the Arctic Ocean, Hofmann's research takes place under extreme climatic conditions: while Fischer has to adapt his "technical things" to saltwater and to the rough weather in the cold, in the heat of Texas extensive efforts are required to keep them cool (the annual average temperature is around 22 °C). The digital processes of the deployed equipment like DNA/RNA scanners, the supercomputer, and servers for temporary storage of the raw data, operate at around 14 °C. On the campus of the university there are six *chilling stations*, cooling units in the form of six-story architectures that work around the clock to produce water cooled to 6 °C, and to distribute this water to the users through a ten-kilometer network of cooling pipes. The electricity for operating the machines is generated on campus in a heating plant independent from the public power grid, and the fossil fuels are supplied (in part) by fracking on the university-owned oil fields in Crane County near Odessa, Texas, which is then transported 600 kilometers to Austin by pipeline (fig. 11).

On August 21, 2014, the art project spent twenty-four hours "listening" and "watching" the machines and infrastructures of this research at eight stations simultaneously. To synchronize the audio and video recordings, we built a network of Raspberry Pi minicomputers connected via the Internet, which spanned the large distances between the recording stations. (18) In 2020, the panorama *Cichlid #3, Soundscape Texas* was shown in Zurich as an audiovisual installation (figs. 12–13). For the presentation of the electromagnetic and piezoelectric sounds, the art project adapted an existing speaker to the specific sounds of the cichlid infrastructure. The TX speaker uses ultrasound to divert directional audio signals around the walls of the exhibition space so that the sounds are perceived differently from each position in the room, and each visitor can compose their own audio work of art in their head (fig. 14). The exhibition space is thus portrayed in its function as an (auditory) infrastructure of art. (19)

The Nineteen-Inch Rack, Zurich 2020

The architect Gottfried Semper, who built the main building of today's ETH Zurich and the nearby Semper Observatory in the mid-19th century, was inspired by the ideals of classical antiquity and the Renaissance. These brought forth, among other things, the golden ratio as a harmonious design rule that would be applied in many arts for centuries.

For the "Wired Nation—Landscape, Architecture, Infrastructure" (20) exhibition on data centers in the historic Semper Observatory, I created the installation *Kaltgang* (Cool Housing) in the fall of 2020 (figs. 15–16). The walk-in art object, executed by a Swiss company specializing in server racks in data centers, is a classic readymade. It is based on the nineteen-inch (48.26 cm) standard that emerged for generic computer hardware enclosures starting in the 1950s. Such tech cages, encased in honeycomb mesh, house our disembodied data that move through the air in so-called "clouds" and are the core of the high-security tracts of solid steel and concrete distributed around the world. The architecture of cool housing is a serially

(17) See The Hoffmann Lab: Mechanisms and Evolution of Social Decision Making, University of Texas at Austin, https://cichlid.biosci.utexas.edu.

(18) For a documentation of the 8 recording situations of "Cichlid #3, Soundscape Texas," see "Cichlid #3, Soundscape Texas (Aug. 21, 2014)," *Computer Signals: Art and Biology in the Age of Digital Experimentation*, https://computersignale.zhdk.ch/en/data/cichlid/panorama.

(19) On the documentation of the exhibition at Kunstraum Walcheturm, Zurich, February 14 until March 11, 2020, and on the TX speaker, see further "African Cichlid #3, Soundscape Texas. Kunstraum Walcheturm, Zurich 2020 (with Valentina Vuksic, Birk Weiberg, Christoph Stähli) (SE)," *Computer Signals: Art and Biology in the Age of Digital Experimentation*, https://computersignale.zhdk.ch/en/about/exhibitions/african-cichlid-3.

(20) The "Wired Nation—Landschaft, Architektur, Infrastruktur" exhibition (https://www.wirednation.ethz.ch/) was developed and curated by myself in collaboration with Monika Dommann, professor for modern history at the University of Zurich, and Hilar Stadler, director of the Museum im Bellpark Kriens, during my fellowship at Collegium Helveticum (ETH, UZH, ZHdK) from 2016 to 2020.

12

13

fig.12 “Cichlid #3, Soundscape Texas,” exhibition view of video installation, Kunstraum Walcheturm, Zurich. Photo: Marc Latzel.
fig.13 “Cichlid #3, Soundscape Texas,” exhibition view of audio installation, Kunstraum Walcheturm, Zurich. Photo: Marc Latzel.
fig.14 TX-Speaker by Christoph Stähli, detail, Kunstraum Walcheturm, Zurich. Photo: Marc Latzel.

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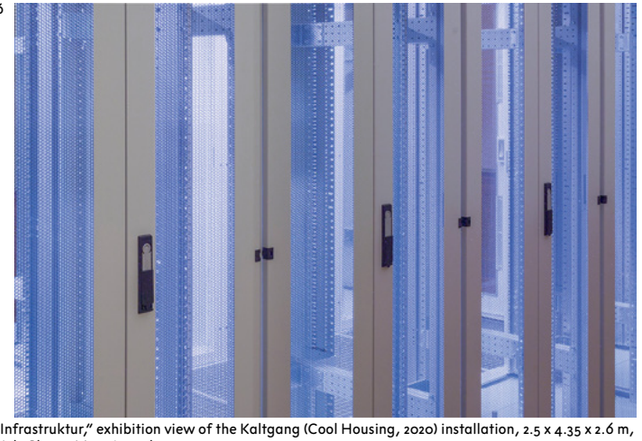

fig.15 “Wired Nation—Landschaft, Architektur, Infrastruktur,” exhibition view of the Kaltgang (Cool Housing, 2020) installation, 2.5 x 4.35 x 2.6 m, 2,250 kg, Semper Observatory at ETH Zurich. Photo: Marc Latzel.
fig.16 “Wired Nation—Landschaft, Architektur, Infrastruktur,” exhibition view of Kaltgang (Cool Housing, 2020) installation, detail, Semper Observatory at ETH Zurich. Photo: Marc Latzel.

expandable container for servers that I call the "Acropolis" of the digital age. It is oriented toward the irreducible nineteen-inch format in which digital hardware currently manifests itself physically.

Conclusion

The more advanced and complexed media technologies become, the less their processes can be perceived by the human senses. At the same time, the infrastructures upon which they are based are increasing in physical mass and spatial scale. The simple bundle consisting of a leading line and an assistant, which organized the relation between animal and human at the end of the 19th century, has expanded into global structures like submarine cables, pipelines, the Internet, et cetera. Nature as the bearer of these networks is thus becoming the "ultimate infrastructure" of its own observation. (21)

My art, too, uses these infrastructures to materialize what is not heard or seen. With this I would like to bring the material conditions of the digital age into a societal negotiation. If this succeeds, the actual product of our efforts would be an (immaterial) conversation. (22) (23)

(21)
Nicole Starosielski, "Fixed Flow: Undersea Cables as Media Infrastructures," in *Signal Traffic: Critical Studies of Media Infrastructures*, ed. Lisa Parks and Nicole Starosielski (Champaign: University of Illinois Press, 2015), 53–70, here 54, https://doi.org/10.5406/illinois/9780252039362.003.0002.

(22)
In the research cooperation *Computer Signals*, which arose in the context of my artistic projects, we practiced this conversation among the participants from the various disciplines as a form of work again and again over the years. In fall 2016 we recorded one of these conversations on the Rigi in Central Switzerland: Philipp Fischer, Gabriele Gramelsberger, Christoph Hoffmann, Hans Hofmann, Hans-Jörg, Rheinberger, and Hannes Rickli, *Natures of Data: A Discussion between Biology, History and Philosophy of Science and Art* (Zurich: diaphanes, 2020), https://doi.org/10.5281/zenodo.5119460; poster online in 2019 as, "Rigi Discussion," *Computer Signals: Art and Biology in the Age of Digital Experimentation*, https://computersignale.zhdk.ch/en/rigi.

(23)
This essay is an expanded version of Hannes Rickli, "Der unsichtbare Faden: Zu Materialität und Infrastrukturen digitaler Tierbeobachtung," *ZKM Zeitschrift für Medien- und Kulturforschung* 7, no. 2 (2016): 137–54, https://doi.org/10.25969/mediarep/18646.

DOI: 10.53788/TAME0115

17′

Measuring, Statistics, and Eugenics Zionism and Modernity in *White City* by Dani Gal

Burcu Dogramaci

The film *White City* (2018) by the Berlin-based artist Dani Gal begins with a postcard (fig. 1) showing a housing colony, defamed by the political Right and labeled "Arab." On the street in front of the white cubes of the buildings are cloaked people of color, while on the ground traders hawk their wares and a camel and a lion are viewable on the right. Then the original postcard appears, showing the previously mentioned motif without any manipulative interventions. It depicts the Weissenhof Estate (Weissenhofsiedlung), built in Stuttgart, Germany in 1927, considered the model housing development of the New Building movement. Among those involved were such architects of the modern movement as Le Corbusier and Walter Gropius. The postcard is viewed by Arthur Ruppin, a German Zionist, shown walking through the Weissenhof Estate over the next few minutes.

Gal conflates several different storylines and places: the creation of the Weissenhof Estate as a project of the modern movement and the White City of Tel Aviv, which is also considered a Bauhaus-related housing development.(1) Ruppin, regarded as a pioneer and one of the founders of Tel Aviv, was a Zionist interested in eugenics who met with the National Socialist racial ideologist Hans F. K. Günther. All the storylines, locations, and times are linked by the theme of measuring or, to be more specific, the taking of measurements for ideological reasons. Moreover, the title *White City* links white modernism with white racism, which is also assigned to the exclusionary logic of Zionism.

White City is the final film in Gal's trilogy *An Elaborate Gesture of Pastness*, which also includes the videos *Night and Fog* (2011) and *As from Afar* (2013).(2) *Night and Fog* brings together two antagonists of history: Adolf Eichmann, one of those responsible for the "final solution" to the Jewish Question, who is sentenced to death in Israel and subsequently cremated. His ashes are to be scattered in the sea off the coast of Jaffa directly after the cremation. This task is undertaken by a small group of policemen, including Michael Goldman-Gilad, a Holocaust survivor. Based on an interview with Goldman-Gilad and his memories, Gal's film provides insight into the night of May 31 to June 1, 1962. *As from Afar* tells the story of the friendship between the publicist and architect Simon Wiesenthal, who devoted his work to the conviction of Nazi criminals, and the chief architect of the "Third Reich," Albert Speer, who, as a National Socialist perpetrator, served a lengthy prison sentence. Based on letters and memories, the film fictionally re-enacts the two protagonists

(1)
See, e.g., Nahoum Cohen, *Bauhaus Tel Aviv: An Architectural Guide* (London: Batsford, 2003); Yigal Gawze, *Form and Light: From Bauhaus to Tel Aviv* (Munich: Hirmer, 2018).

(2)
See Dani Gal and Mika Hayashi Ebbesen, eds., *An Elaborate Gesture of Pastness: Three Films by Dani Gal* (Berlin and Lausanne: Motto Books, 2021).

conversing while walking together. Gal's trilogy reflects historiography as being constructed from oral and written traditions; visual, acoustic, and textual memory; media recordings; and the interpretation of the record. Gal brings to light the little-noticed or deliberately repressed; moreover, he adds the fictional to the factual to bring awareness to the unwitnessed. In this way, he creates the possibility of many other untold episodes. (3) A largely ignored constellation between two antagonists in 1933 is also the subject of the third film in the trilogy, *White City*, which will be discussed in the following. (4)

Ruppin Meets Günther: National Socialist Racial Ideology and Zionist Eugenics

In an excerpt from Gal's film *White City*, we see the first of two flashbacks drawn from Ruppin's memory on his walk through Weissenhof: First we see Ruppin at an earlier stage of his life at work as he measures and photographs a man (figs. 2–3). Next, he tries to persuade him to leave and settle down in Palestine. Finally, Ruppin pays the man some money, and the latter leaves the office. The fictional scene is presumably set in the late 1920s and shows how Ruppin took photos for his publications.

In an essay published in the periodical *Der Jude* in 1918/19, Ruppin demands racial hygiene and the "selection of human material" as a condition for the establishment of a Jewish state in Palestine: "The objective of immigration policy must be to maximize the percentage of elements which in terms of profession, health and character are suitable for the Jewish community in Palestine, and to minimize the percentage of unsuitable elements." (5) The ideal immigrant—who, once selected, would receive an "approval certificate" granting them access to credit, medical care, and insurance—had to meet ideal physical and mental prerequisites: he had to be physically strong, no more than thirty years old, and preferably married to a woman who also wanted to help with farm work. Those who were unable to work, people with epilepsy or mental illness, and those with asocial or criminal tendencies would be excluded so that only "'racial Jews' would come to Palestine." (6)

Since his first trip to Palestine in the summer of 1907, Ruppin had been one of the leading figures in efforts to develop a "national Jewish homeland in Palestine," was head of the Zionist institution known as the Eretz Israel Office, and was thus substantially involved in the "pioneering and development phase of pre-state Israel." (7) Before his first trip to Palestine, Ruppin became director of the newly established Bureau for Jewish Statistics and Demography in Berlin. His work there and his commitment to Zionism and the Jewish State of Palestine culminated in the two-volume book *Soziologie der Juden*, published by the Jüdischer Verlag Berlin in 1930/31 (fig. 4). The first volume begins with an analysis of the status quo, detailing the origin, number, urban-rural distribution, marriages, births, and economic situation of the Jews. In contrast, the second volume is devoted to the future of the Jews and primarily addresses their struggles for rights, equality, and the accomplishment of Zionist goals, such as the return to Palestine. Volume one primarily consists of a plethora of data, population statistics, birth rates, and frequencies of marriages. Besides these figures, however, Ruppin also addresses the "racial position of the Jews," as he calls it, and describes "Jewish

(3)
For extended reflections on this point, see Burcu Dogramaci, "History in Motion and the Presence of the Untold," in Gal and Hayashi Ebbesen, *An Elaborate Gesture of Pastness*, 81–106.

(4)
See also Dani Gal and Burcu Dogramaci, "Zionism and Modernity in *White City*," (conversation, presented at the video symposium "Taking Measures: Usages of Formats in Film and Video Art," 2020), https://takingmeasures.ch/videos/white-city/.

(5)
Arthur Ruppin, "Die Auslese des Menschenmaterials," *Der Jude* 3, no. 8/9 (1918/19): 373–83. This contribution was also published in Arthur Ruppin, *Dreissig Jahre Aufbau in Palästina: Reden und Schriften* (Berlin: Schocken Verlag, 1937), 90–105. (This and all subsequent translations, unless otherwise cited, are by Ilze Mueller.)

(6)
Ruppin, "Die Auslese des Menschenmaterials," 381. For more details, see Ita Heinze-Greenberg, *Europa in Palästina: Die Architekten des zionistischen Projekts 1902–1923* (Zurich: gta Verlag, 2011), 84; see also Etan Bloom, "The 'Administrative Knight': Arthur Ruppin and the Rise of Zionist Statistics," in *Tel Aviver Jahrbuch für deutsche Geschichte* XXXV (2007): *Demographie – Demokratie – Geschichte: Deutschland und Israel*, ed. José Brunner (Göttingen: Wallstein, 2007), 183–203, here especially 199–200.

(7)
For all aspects, see Heinze-Greenberg, *Europa in Palästina*, 84.

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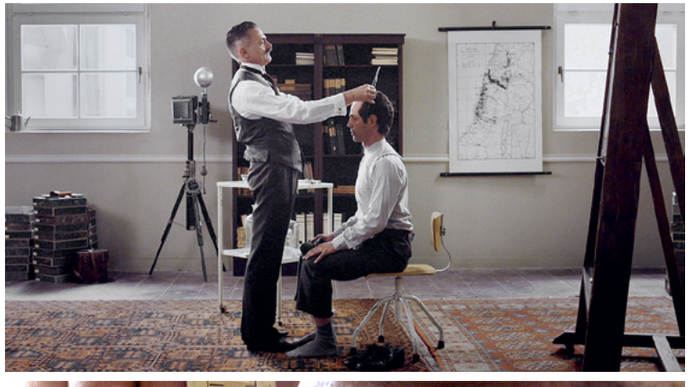
figs. 1–3 Dani Gal, *White City*, 2018, HD video, 25 min, camera: Itay Marom, production: Dani Gal, Pong Film. © Dani Gal.



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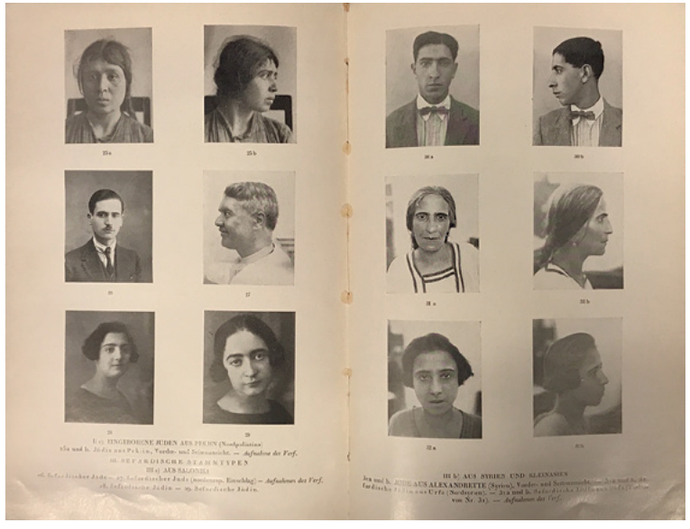

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fig. 4 Arthur Ruppin, *Soziologie der Juden*, vol. 2 (Berlin: Jüdischer Verlag, 1931), book cover, Institut für die Geschichte der deutschen Juden, Hamburg.

fig. 5 Arthur Ruppin, *Soziologie der Juden*, vol. 1 (Berlin: Jüdischer Verlag, 1930), pages from image section, Institut für die Geschichte der deutschen Juden, Hamburg.

tribal types" and the "regeneration of Jewish types." (8) Ruppin assembles Ashkenazi, Sephardi, and Babylonian "tribal types"; Yemeni "special types"; and "alien types" (fig. 5). And he operates with racial concepts such as "inbreeding," "selection," and "blood" (stating, for instance, that "the blood of the non-Jewish population seeps into the Jews in legitimate and illegitimate ways"). (9) Ruppin must have been struck by the parallels to National Socialist racial ideology. A passage written in his diary in Jerusalem dated January 31, 1930, supports this idea:

> Last week, in a Tel Aviv bookshop, I found a recently published book by Hans F. K. Günther: *Rassenkunde des jüdischen Volkes*. It contains some ideas [paths of thought] and photographs of antique pictures that I would like to include in my book. Fortunately, the race question will take up only a small amount of space in my book. (10)

A few years later, in 1933, there was a meeting between the National Socialist ideologist Günther, who had published his book *Rassenkunde des deutschen Volkes* in 1922, and the Zionist Ruppin. In Prague, on March 16, 1933, Ruppin commented on a two-week visit to Germany, during which he promoted his plan "to solve the Jewish question in Germany through the emigration of 250,000 Jews to Palestine, the US, and other countries." (11) Ruppin presented himself to the Foreign Office in Berlin, where he successfully negotiated about the currency and goods Jewish immigrants to Palestine would be allowed to take with them and informed leading members of the Jewish community, including Leo Baeck, Fritz Rathenau, and Ludwig Tietz, of his plans. In this context, he also visited Günther. Ruppin writes:

> Through Dr. Georg Landauer, I travelled to Jena on 11 August to meet Professor Hans F. K. Günther, the founder of National Socialist race theory. The conversation lasted two hours. Günther was most congenial but refused to accept credit for coining the Aryan-concept and agreed with me that the Jews are not inferior but different, and that the Jewish Question has to be regulated properly. (12)

In Gal's video, this short entry becomes a central scene of the film (fig. 6). We see the meeting of two men with diametrically opposed convictions: one is an anti-Semite, the other a Zionist Jew. At the same time, their methods and biological, or rather biopolitical, convictions are so closely related that we get a paradoxical situation: the two men agree that ethnic and religious origins can be physiognomically quantified. Here, Gal touches on a sensitive point: racial ideology cannot only be assigned to the racist Günther but is also represented by the Zionist Ruppin. (13) Günther's racial ideology was mainly aimed at creating the outline of a "Nordic race," as he synoptically linked physical and mental characteristics (which he called the "racial soul"), qualities such as "sagacity, truthfulness and energy." (14) Awareness of racial characteristics, specifically those of the "Nordic race," would also entail awareness of the dangers of the miscegenation and "degeneration of the Nordic race" ("Entnordung"). At the same time, Günther also regarded the Jews as a threat to the purity he aimed for—the goal was the "restoration of the Nordic race" ("Wiedervernordung"). (15) It was from this perspective on the Jews that Günther formulated the book mentioned by Ruppin, *Rassenkunde des jüdischen Volkes*: Günther also distinguishes between different

(8) Arthur Ruppin, *Soziologie der Juden*, vol. 1 of 2 (Berlin: Jüdischer Verlag, 1930/31), table of contents.

(9) Ruppin, *Soziologie der Juden*, vol. 1, 36. Nevertheless, at the core of his work, Ruppin was not a racist who devalued other ethnicities or cultures. Ita Heinze-Greenberg speaks of racial doctrine, but not of racism in Heinze-Greenberg, *Europa in Palästina*, 96.

(10) Arthur Ruppin, *Tagebücher, Briefe, Erinnerungen*, eine Veröffentlichung des Leo Baeck Instituts, ed. Schlomo Krolik (Königstein im Taunus: Jüdischer Verlag Athenäum, 1985), 422.

(11) Ruppin, *Tagebücher*, 446.

(12) Ruppin, *Tagebücher*, 466, translated from German by Dani Gal.

(13) Günther's book *Rassenkunde des deutschen Volkes* appeared in a 9th expanded edition as early as 1926, in which he defines race as "a group of people who due to the combination of physical characteristics and psychological qualities they possess differ from every other group of people and consistently procreate only offspring like themselves." Hans Friedrich Karl Günther, *Rassenkunde des deutschen Volkes*, 1926, 9th ed. (Munich: Lehmann, 1938), 14.

(14) See Peter Emil Becker, *Sozialdarwinismus, Rassismus, Antisemitismus und Völkischer Gedanke: Wege ins Dritte Reich*, vol. 2 (Stuttgart and New York: Georg Thieme Verlag, 1990), 237.

(15) Becker, *Sozialdarwinismus*, 246.

"types of Jews, calling some ungainly, and others (the Sephardi Jews) more distinguished and noble."(16) Günther rejects the symbiosi of Jews and Germans and compares Zionism to the "Nordic Idea," concluding that the two are equivalent.(17) Gal stages the meeting as an intimate dialog between two antipodes developing certain similarities and sympathies.(18)

Incidentally, both used photographs to support their arguments. Günther employed racist visual imagery (fig. 7) and a "visual text" to convince his readership.(19) He followed the basic pattern of repetition to argue concisely and construct homogenous types. For this purpose, he did not take his own photographs but used photos from museums, private collections, and research institutions.(20) As far as possible, he chose standardized compositions regarding the distance between camera and model, lighting, and perspective. Double pages show either several different models or one model in profile and frontally. The objective is always to emphasize similarities and differences (which are to be traced back to cases of miscegenation).

In his book *Soziologie der Juden*, Ruppin also used photographs, most of which he had taken himself.(21) His photographs have similar characteristics: the subjects were photographed close up and emphatically lit. The ample color plate section is a collection of portrait photographs organized as an archive of Jewish typology; the juxtaposition of the images facilitates comparison and contrast. Thanks to the frequently repeated frontal and profile views of the models, physiognomic details, such as facial proportions, can be distinguished, thereby providing a way of identifying allegedly uniquely ethnic or racial characteristics of hair, forehead, nose, and chin. While many of those portrayed are anonymous, notable contemporary figures, such as the physicist Albert Einstein, who is alleged to have a "Mediterranean element," are also included.(22)

Photos on Ruppin's desk in Gal's film *White City* refer to his presumed practice of using photography as a tool to collect data and illustrate his writings, such as *Soziologie der Juden*. Among the photographs is one showing a drawing made by Richard Kauffmann (fig. 8), a reference to Ruppin's function as the head of the Palästina-Amt as part of the Jewish Agency for Palestine and thus responsible for the Jewish settlement of Palestine. In this capacity, Ruppin appointed Kauffmann head architect of the Palestine Land Development Company at the end of 1920. Subsequently, Kauffmann developed almost 150 moshavim, kibbutzim, and garden city-like estates in Palestine, which would later become Israel—Kauffmann thus made himself "a name in Israel as the first and foremost estate planner in the country [...]. Some regarded him as 'The City Planner' of the Old New Land par excellence."(23) There is thus a link between the Zionist Ruppin and modernist architecture in Palestine—Kauffmann also designed buildings for the White City of Tel Aviv.

Tel Aviv and Weissenhof: The Dream of Standards

The film's title, *White City*, refers to the White City of Tel Aviv, which has gone down in architectural history as the city of the New Building style in exile. The name refers to the white outer shell of many of the buildings, some of which hark back to plans designed by former Bauhaus students who emigrated from Germany or at least follow the parameters of Weimar Republic–era modern architecture.

(16)
Becker, *Sozialdarwinismus*, 264.

(17)
Becker points out that here Günther overlooked (or rather wanted to overlook) the fact that Zionism had come into existence as a reaction to anti-Semitism. Becker, *Sozialdarwinismus*, 268. However, it is precisely the supposed proximity between the ideas of Zionism and National Socialist eugenics regarding the motivation of Jews from Germany (and other states) to return to Palestine that frames the meeting between Günther and Ruppin.

(18)
For those who know about the Shoah, which was ideologically based on racial theories, this scene is very difficult to bear. The architectural historian Ita Heintze-Greenberg also describes the meeting on August 11, 1933 as "a two-hour scholarly exchange between two professors that we find disconcerting today." Heinze-Greenberg, *Europa in Palästina*, 94.

(19)
Amos Morris-Reich, *Race and Photography: Racial Photography as Scientific Evidence, 1876–1880* (Chicago and London: University of Chicago Press, 2016), 118.

(20)
Morris-Reich, *Race and Photography*, 119–20.

(21)
This can be determined at least for the German edition. In the Hebrew edition of *Sociology of the Jews* (Tel Aviv: Steibel, 1933), Ruppin uses a different layout and photographs from various sources. See Morris-Reich, *Race and Photography*, 192–94.

(22)
Ruppin, *Soziologie der Juden*, vol. 1, image section.

(23)
Heinze-Greenberg, *Europa in Palästina*, 182. Both Ruppin, as the ideological father of the Israel / Palestine project, and Kauffmann, as the country's architect or city builder, can be called *the architects of Palestine*.

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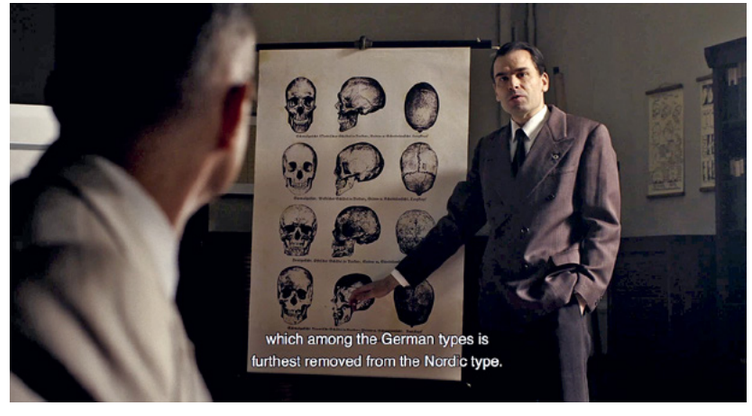

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figs. 6–8 Dani Gal, *White City*, 2018, HD video, 25 min, camera: Itay Marom, production: Dani Gal, Pong Film. © Dani Gal.

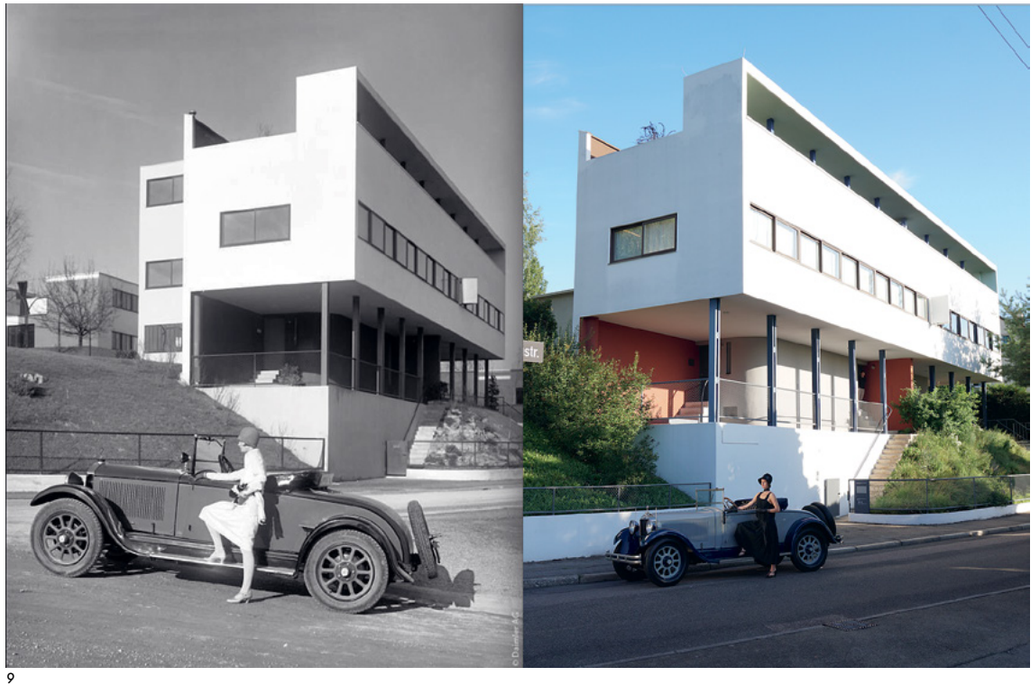

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fig. 9 Left: New Woman (Elsbeth Böklen) with a car at the Weissenhof Estate, 1928. Right: Dani Gal, *White City*, 2018, HD video, 25 min, camera: Itay Marom, production: Dani Gal, Pong Film. © Dani Gal.

However, *White City* also refers to the Weissenhof Estate on the Killesberg Hill in Stuttgart, which opened in July 1927. The Weissenhof Estate was part of the Werkbund exhibition "Die Wohnung" (The Dwelling) and was intended as a model for industrially oriented, modern residential building. Seventeen architects from Germany, the Netherlands, Austria, and Switzerland designed residential buildings that followed the paradigm of functionality and practicality.

Le Corbusier's building in particular was considered a symbol of progress and a new start. It was even featured in an iconic, widely distributed commercial photograph for the automobile company Daimler in which the New Woman (Elsbeth Böklen) poses with a car in front of the structure (1928).(24) Gal embedded a reference to this photo in his film (fig. 9). Connections between the Zionist Ruppin and the Weissenhof Estate, through which he strolls, lost in thought, can be made on several levels. On the one hand, Ruppin directs attention to the debate already taking place in the 1920s around the future of German Jews outside Germany and in Palestine, which ended in the mass emigration after 1933. Thus, the exile of protagonists (not only to Palestine) and the emigration of the basic aesthetic principles of New Building were already inscribed in the architecture of the Weissenhof Estate.(25)

Still, Arthur Ruppin was not only a Zionist but also a number-oriented statistician and eugenicist. For instance, as early as 1907, he tried to conduct a census in Jerusalem during his first Palestine trip.(26) Moreover, Ruppin was the publisher of the *Zeitschrift für Demographie und Statistik der Juden*. He represented a Zionism that legitimized itself through facts and figures.(27) Figures were the basis of his argumentation, while the dimensions of physiognomies were the basis of his understanding of a diaspora Jewry, which manifested itself in numerous quantifiable variants in a wide variety of geographic areas. Ruppin's ideas of measurability and quantifiability have an equivalent in the Weissenhof Estate's standardized buildings, which were sometimes constructed of industrially prefabricated components.

The housing estate, built using lightweight concrete, dry construction, and skeleton construction methods, could thus be erected within just twenty-one weeks.(28) However, this presupposed that the architectural structures had to be planned and manufactured as standardized units. A good example is the two houses Walter Gropius built in the Weissenhof Estate: their ground plans were designed on a square grid with a steel framework forming their primary structures. These and other industrially prefabricated buildings had to be constructed with a basic assumption of an ideal measurement.

This concept is reflected not least of all in Le Corbusier's architectural theory of the Modulor (figs. 10–11). The Modulor is a system of proportions that organizes architecture based on human dimensions. The German edition of the eponymous book *Der Modulor* has the subtitle "Darstellung eines in Architektur und Technik allgemein anwendbaren harmonischen Maszes im menschlichen Maszstab," referring to a range of harmonious measurements to suit the human scale, universally applicable to architecture and mechanical things. The system is based on a standard human size; for Le Corbusier, as shown by a sketch from 1946, this was a male (presumably Western European) body measuring 1.75 meters from head to toe.(29)

(24)
The photo by Daimler is published in a column by Karin Berkemann, "Auto vor Haus," *Moderne Regional*, September 9, 2019, https://www.moderne-regional.de/auto-vor-haus/stuttgart-weissenhofsiedlung-bild-historabbildung/.

(25)
It is important to emphasize that the building materials for the White City of Tel Aviv and other Jewish settlements came from Nazi Germany as per an agreement between Zionist organizations and the Reich Ministry of Economics. One can thus also speak of migrated materials. See Ines Sonder and Joachim Trezib, "Baumaterial aus Nazi-Deutschland in Tel Aviv," *Bauwelt* 26 (2019): 58–59, https://www.bauwelt.de/dl/1519728/Baumaterial_aus_Nazi-Deutschland_in_Tel_Aviv.pdf.

(26)
Heinze-Greenberg, *Europa in Palästina*, 85.

(27)
This meant that his cause also gained acceptance among the financially powerful assimilated Jewish upper class in the US—he justified the establishment of a Jewish Palestine, not so much ideologically but as a sustainable investment. Bloom, "The 'Administrative Knight,'" 194.

(28)
"Weissenhof Estate: A Built Manifesto of Modern Housing," *IBA'27*, https://www.iba27.de/en/knowledge/the-iba27/100-years-weissenhof/.

(29)
On Le Corbusier's Modulor, see Jean-Louis Cohen, "Le Corbusier's Modulor and the Debate on Proportion in France," *Architectural Histories* 2, no. 1 (2014), http://doi.org/10.5334/ah.by. Since Le Corbusier used the principle of the Modulor for housing units such as Unité d'Habitation à Marseille, which housed many residents from the North African colonies, one can ask to what extent deviating body sizes of people of Algerian or Moroccan origin, for example, were taken into account.

The standardized thinking of the New Building movement is also formulated in Ernst Neufert's foundational work *Bauentwurfslehre*. In 1919, Neufert was part of the first generation of students at the Weimar Bauhaus, and he also worked in Walter Gropius's private office. In 1938, under the National Socialist architect Albert Speer, Neufert began working as a commissioner for type standardization, standardization, and rationalization in Berlin housing construction. (30) Neufert's *Bauentwurfslehre*, first published as early as 1936, codified the dimensions and scale of architecture for generations and continues to do so. As a resource for students, architects, and building owners, the book provides information about standards, dimensions, setback areas, and the ergonomics of the human environment. (31)

Not only norms such as those found in Neufert's reference book and Le Corbusier's work but also those articulated in the plans for the Weissenhof Estate were only possible because deviations were perceived as the exception. In other words, standardized architectural structures assume there is an intended client whose size, needs, and wants are presupposed. Thus, we are dealing with an ideology that does not function in a differentiated manner but a homogenizing one. This means that New Building formalism does not react to needs or minorities in a differentiated way. Thus, even on an aesthetic level, the White City is exclusionary and doctrinaire. Therefore, transferred to the White City of Tel Aviv, *whiteness* can thus definitely be read as political.

(30)
See Michael Kasiske, "Der andere Neufert: Ausstellung in Dessau," *Bauwelt* 40 (2013): 2–3, https://www.bauwelt.de/dl/747155/bw_2013_40_0002-0003.1928281.pdf.

(31)
Ernst Neufert, *Bauentwurfslehre: Handbuch für rationelles Bauen* (Berlin: Bauwelt Verlag, 1936). In 2021, the 43rd edition of *Bauentwurfslehre* was published by Springer; the book was translated into 18 languages.

White Modernity, White People: Racism and Zionism

In his book *White City, Black City* (2015), architect and author Sharon Rotbard refers to the construction of the myth of the White City of Tel Aviv, which he also interprets as a history of violence. Rotbard does more than deconstruct the term "Bauhaus City" as false and to unmask it as a Eurocentric attribution to a "white" Israel with roots in Europe. (32) For my deliberations, I would like to take up another line of argument from *White City, Black City*: In Rotbard's book, the "Black City" is the diametric opposite or the repressed "Other" of the "White City." Among other places, such as Jaffa, the Black City refers to the Arabic quarter of Menashiya, which was destroyed in 1948 and whose inhabitants were driven out. As Rotbard writes, the "Black City" of Jaffa was also "cleansed" of Arab Palestinians and "Hebraicised," as Arabic inscriptions were eliminated from daily life during the War of Independence in 1948. (33) Rotbard argues that "black" refers to the dark skin color of Palestinian Arabs in contrast to the "whiteness" of European Jews who settled in Palestine in the early 20th century and created a "White City" in Tel Aviv in keeping with the color of their skin. Although this dichotomous argument about skin color could be discussed critically in the context of Palestine/Israel and immigration to Israel, Rotbard's book may open a new challenging perspective on the connotations of "white" architecture.

In the last scene of Gal's *White City*, the film's protagonist Ruppin strolls through the Weissenhof Estate while the housing colony is transformed into the very same scene depicted on the de famatory postcard: it turns into an "Arab housing colony" out of which its inhabitants are driven on a military truck (figs. 12–13).

(32)
Sharon Rotbard, *White City, Black City: Architecture and War in Tel Aviv and Jaffa* (London: Pluto Press, 2015), 24–32.

(33)
Rotbard, *White City, Black City*, 107–14.

In the Weissenhof Estate, Ruppin encounters a problem that continually preoccupied him in his diary entries: the conflict between Arabs and Jews. There are repeated reports about assassinations, attacks, and riots with fatalities. Vehemently, Ruppin stands up for the rights of the Jewish immigrants, describes their role in the economic upturn, and argues against Arab fears of becoming a minority in their own country. Ruppin writes:

> At the time we talked [in 1908], there were around 80,000 Jews in Palestine, roughly 11 percent of the population. Today, there are around 400,000 Jews, that is, 40 percent of the population. The economic situation of the non-Jewish population has in no way become worse as a result of the influx of Jews. On the contrary, their living standard has noticeably risen—a fact that strikes every visitor to Palestine. (34)

At the core of Ruppin's understanding of Zionism is the "Arab question," in other words, the treatment of Arabs in Palestine. Alex Bein comments on this as follows: "From his [Ruppin's] first book to his last, in his speeches at Zionist congresses, in memoranda and countless letters, he keeps coming back to this question. He saw it as a fundamental problem on whose solution the prospects of establishing a Zionist state largely depend in the first place." (35)

At the beginning of his Zionist activities around 1900, Ruppin still had the firm conviction that the coexistence of Jews and Arabs was possible since the economic successes of the returned Jews would also contribute to the prosperity of the Arab population; Ruppin underestimated the rise of a political Arab movement. (36) In his speeches during the 1920s, he supported a two-state solution; after the bloody riots in Hebron in 1929, however, a disenchanted Ruppin realized that peaceful coexistence was not yet possible. In 1931, Ruppin also formulated this in the second volume of his book *Soziologie der Juden*:

> However, such an *economic peace* can hardly be achieved as long as the Arabs simultaneously perceive the immigration and economic activity of the Jews as a *political* threat. [...] It is very likely that in the present situation of extreme tension between both peoples, the Arabs will reject the principle of binationalism and insist that Palestine is an Arab state in which Jews should have only minority rights. But even then, the Jews must remain committed to the principle of binationalism. This is necessary not only regarding a settlement with the Arabs but also in order to make it perfectly clear to the League of Nations that the Jews do not intend to attach their nationality to another nationality. If the Arabs reject the principle of binationalism, the Jews have no choice but to continue their work in Palestine based on the provisions of the mandate and await a later time to reach an understanding with the Arabs. (37)

Nevertheless, he continued to support the settlement of Palestine, which would involve immigration, the purchasing of land, and settlement rights. (38)

Gal's *White City* ends with images of deportation: with their luggage, the Arab inhabitants of the city walk toward trucks waiting to transport them out of the city. (39) With these images, Gal refers to photographs of the Nakba, the flight and expulsion of roughly 750,000 Arab inhabitants of Palestine between 1947 and 1949. In 1947,

(34)
Arthur Ruppin, diary entry dated June 1, 1936, in Ruppin, *Tagebücher*, 472.

(35)
Alex Bein, "Nachwort: Arthur Ruppin, der Mensch und sein Werk," in Ruppin, *Tagebücher*, 547–84, here 579.

(36)
Bein, "Nachwort," 579.

(37)
Ruppin, *Soziologie der Juden*, vol. 2, 296–97.

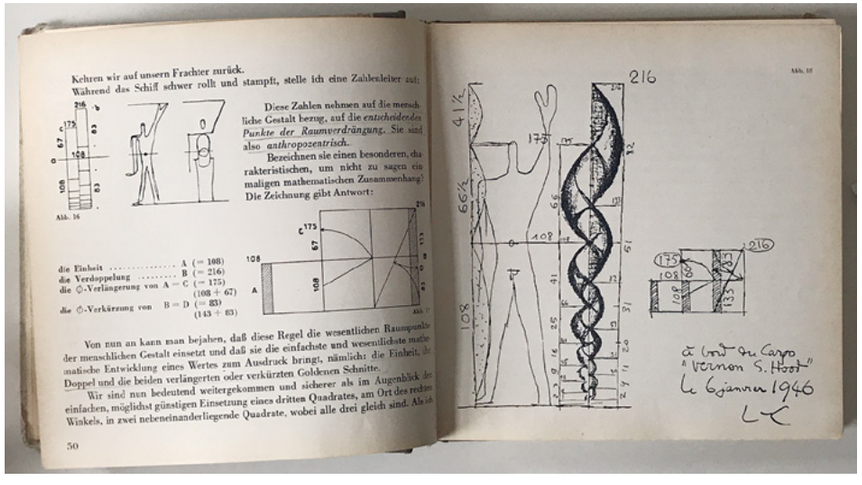
(38)
Bein, "Nachwort," 581.

(39)
See Sa'ed Atshan, "White City: Spectre of the Palestinians," in Gal and Hayashi Ebbesen, *An Elaborate Gesture of Pastness*, 111–21, here 117–18.

10

figs. 10–11 Le Corbusier, *Der Modulor: Darstellung eines in Architektur und Technik allgemein anwendbaren harmonischen Maszes im menschlichen Maszstab* (2nd edition 1956; reprint Stuttgart: DVA, 1978), half title and 50–51, Staats- und Universitätsbibliothek Hamburg, Carl von Ossietzky.

11



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13

14

figs. 12–14 Dani Gal, *White City*, 2018, HD video, 25 min, camera: Itay Marom, production: Dani Gal, Pong Film. © Dani Gal.

a UN resolution was reached that called for the division of Palestine—under British mandate since the break-up of the Ottoman Empire—into two states. The Arab Palestinians rejected this solution (a point Ruppin also raises), as it violated the sovereignty and self-determination of the non-Jewish population of Palestine. This resulted in a war between Jewish and Arab Palestinians and Israel's declaration of independence.

In Gal's film, the Nakba, as an Arab trauma, is an expulsion from the "White City."(40) Although Ruppin died long before the years of the Nakba, his ideas, figures, measurements, and distinctions between people and ethnicities continued to spread ominously. In Gal's *White City*, separate events in history and architectural history intersect and commingle: modernist architecture, the racist doctrine of National Socialism, Zionism, exile, and the Nakba. Even the first image of the film contains these confusing memes: in the defamatory postcard depicting the Weissenhof Colony, the *Arabic* architecture is an apparent model of modernity and its dark side.

The postcard is one of many forms of media used in Gal's work: As a medium in the literal sense of the word, that is, as a mediator between the sender and recipient, the postcard is a historical document and indicative of the pervasiveness of stereotypes. *White City* is a digitally produced film that looks at analog techniques of reproduction and recording. First and foremost, it examines analog photography—for instance, when a man's data are recorded and his measurements taken or in scenes dealing with photographs that support classification and attempts to arrange facial features in proper order. Gal's digital camera observes the analog camera during production (fig. 14). Other films by Gal touch on different analog media, such as recordings as storage for political speeches, audiotapes, voice recordings, and imagined or staged television interviews.(41) Characteristic of the media Gal thematizes or uses is that they never fulfill only one media-related function. Rather, they are media for recording and propaganda, documents of contemporary history, and points of departure for changing appropriations or fictionalized memories. In *White City*, the filmed postcards make the blurred lines between the documented and the fictionalized obvious: historical postcards of the Weissenhof Estate from 1927 were manipulated to depict an Arab village for political reasons to denunciate the modern movement as exotic and strange.(42) Gal adapts both variations—the *original* and the *manipulated*—in *White City*, which is itself a fictionalized film based on original documents.

When the video focuses on historical documents, such as the Weissenhof Estate postcard or the photographs of the Nakba, as references, history is brought to life from a present-day perspective. Conversely, the shadows of the past follow present events. The history and ongoing presence of conflicts in and around Israel, the Arab world's unwillingness to reconcile with the State of Israel, and the treatment of Palestinians have a prehistory—including a media prehistory—and are at the same time closely linked to Western European architectural history and political history.

(40)
On the Nakba, see Katharina Kretzschmar, *Identitäten im Konflikt: Palästinensische Erinnerung an die Nakba 1948 und deren Wirkung auf die dritte Generation* (Bielefeld: transcript, 2019); Marlène Schnieper, *Nakba – die offene Wunde: Die Vertreibung der Palästinenser 1948 und die Folgen* (Zurich: Rotpunktverlag, 2012).

(41)
See Dani Gal's works such as *Historical Records* (2005–), *Krapp's Last Tape, By Samuel Beckett* (2013), and *Fields of Neutrality* (2019).

(42)
See Noit Banai, "Hallucinatory Cinema and the Dialogical Politics of Framing," in Gal and Hayashi Ebbesen, *An Elaborate Gesture of Pastness*, 18–23; see also Thomas Elsaesser, "The Architectural Postcard: Photography, Cinema, and Modernist Mass Media," *Grey Room* 70 (2018): 80–101, here 97.

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Forensis as Critical Practice

Ursula Frohne in conversation
with Eyal Weizman

URSULA FROHNE To start, I think it would be good to hear your perspective on how the term *forensis* is programmatic for the investigative work of the project of Forensic Architecture. Could you elaborate on the meaning and emergence of this notion in the context of your critical practice?

EYAL WEIZMAN Thank you for this question because I think the formation of the project of Forensic Architecture hangs on that word *forensis*. There are multiple ways to explain that. Of course, the word derived from *forensis*—*forensics*—is now undergoing or has, over time, undergone a kind of a meaning drift. So, what we associate today with the scientific expertise used by different state agents, such as the police, the secret services, and perhaps the military, to restore control and order of a society through the criminal justice system had a much wider meaning in the past, in the Classical Age. It is in this classical sense of the term *forensics* that we try to mine and, to a certain extent, rescue from this telescoping of meaning, which has reduced it to this extent. We do so primarily because we do not see ourselves as belonging to the history of forensic practices. The genealogy of our practice is derived from somewhere else. That is to say: we are not the continuation of the "Bertillons" of the world—those who started the police archive, physiognomy, fingerprints, etc. Rather, we come from a tradition of contestation, a tradition of militant truth, and a tradition by which the very frameworks within which truth is allowed to be spoken need to be contested. So, *forensis*, in its original meaning, in the way I understand it as it was used by the great orators of the first century, is really the presentation of things in the forum. *Forensis* is that which belongs to the forum, and the forum is the public space. It is a space of exchange of ideas and goods; it is a space of the polis. The forum also has a certain imperial flavor, but that is not the meaning it had in imperial Rome, of course. *Forensis* is making evidence public and the presentation of ideas, facts, and things within the public domain to promote a certain idea, a certain politics, to make a point, not only about what has happened in the past but what should happen in the future. The expansion of the term is really important: *forensis* is not what belongs to the court; it is what belongs to the forum. Taking the evidence from the privilege of the court and the legal system into the chaotic, conflictual, and to a certain extent, the civil war we are experiencing right now and placing it in the public domain as a militant claim is much more

Mare Clausum
The Sea-Watch vs Libyan Coast Guard Case
An Investigation by Forensic Oceanography and Forensic Architecture

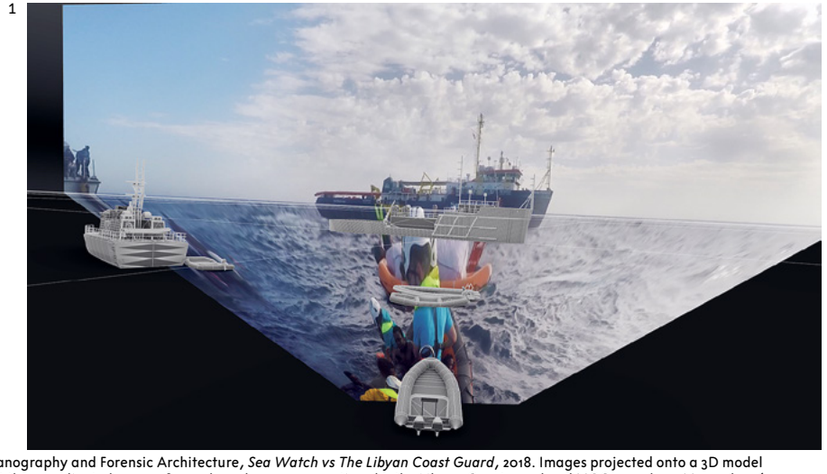
"On the night of November 5 to 6, 2017, a rubber boat left Tripoli, carrying between 130 and 150 people. That night, the vessel of the rescue NGO Sea-Watch was patrolling off the Libyan coast, just outside of Libya's contiguous zone, waiting for the next boat to rescue. At around 3 a.m., the crew on duty saw the returns of two large ships on its radar screen. As these were not accounted for by AAS vessel tracking data, which most civilian ships are required to emit, the Sea-Watch crew believed them to be military: either part of EUNAVFOR MED, the EU's anti-smuggling operation, or of Italy's Mare Sicuro operation, which has provided support to the Libyan coast guard and navy in combating illicit traffic. Both these operations are part of a policy that aims to prevent migrants from crossing the sea by outsourcing border policing to Libya.

As the migrants advanced, the sea became rougher, and their boat began taking in water. The passengers contacted the Italian coast guard for help via satellite phone. At 5:53 and 6:01 a.m., Sea-Watch received a distress signalization from the Italian coast guard indicating no specific position but that the vessel had departed from Tripoli. Sea-Watch adapted its course immediately. The Italian coast guard also informed their Libyan counterparts, who had a vessel on patrol off the coast of Tripoli and, according to a Libyan official we interviewed, requested their intervention.

On August, 10 2017, the Libyan authorities had unilaterally declared the search and rescue zone within which they claimed the responsibility to coordinate rescue and repeatedly threatened NGOs entering it. Through the satellite phone provider, the Italian coast guard was soon able to determine the boat's location at 6:00 a.m.—the only georeferenced position we possess for the migrants' trajectory prior to rescue—and passed it on to Sea-Watch at 6:31 a.m. The Italian coast guard also warned Sea-Watch that the Libyan coast guard was present within a nine nautical-mile radius from the migrants' boat and that Sea-Watch should proceed with caution.

Sea-Watch's vessel is equipped with seven wide-angle cameras mounted on the mast and deck that are constantly recording; two of these capture crucial video evidence for our investigation. Two additional GoPro cameras mounted on Sea-Watch's rigid-hulled inflatable boats, or RHIBs, provide close-up perspectives. Triangulating visual data from these cameras as well as from another located on the Libyan coast guard vessel allowed us to generate a dynamic model of the scene. Navigating the model between different camera perspectives and cross-referencing this evidence with testimony and locational data allowed us to reconstruct the entire rescue operation and its dire consequences as they unfolded." (1)

(1)
Title credits and voiceover transcription of an excerpt from *Mare Clausum: Sea Watch vs The Libyan Coast Guard* (2018), video and further information accessible on Forensic Architecture's website, "Sea Watch vs The Libyan Coastguard," April 4, 2018, https://forensic-architecture.org/investigation/seawatch-vs-the-libyan-coastguard.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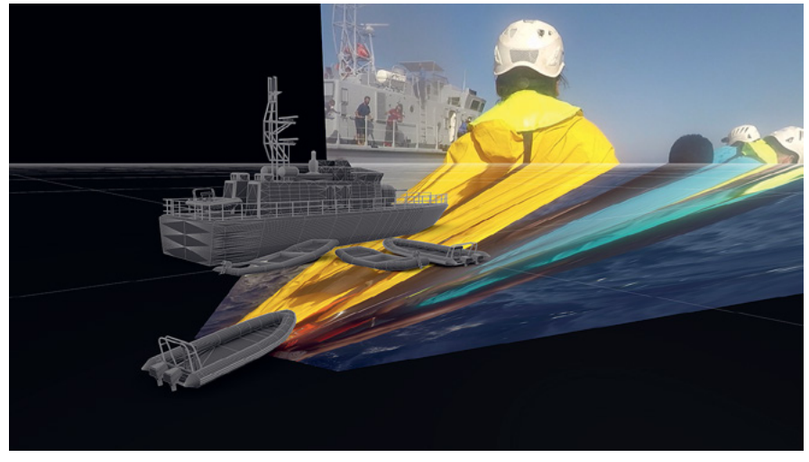
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figs. 1–2 Forensic Oceanography and Forensic Architecture, *Sea Watch vs The Libyan Coast Guard*, 2018. Images projected onto a 3D model to reconstruct the complicated scene of search-and-rescue operations by the Libyan Coastguard and NGO vessels on November 6, 2017.

important to us. Counter-forensics is an aspect of *forensis* that contests the modes, means, spaces, and institutions in which society has established where in the state's buttress facts can and should be uttered and by whom and in what manner. We want to break all these and find new fora, new places, and new ways to address our audience. We want to present our work not only in courts but also on the street, in truth commissions, in art and cultural spaces, in the media, and wherever we can so that we can make facts public in the way they should be and have been, I believe, at some point.

UF Thank you very much for elaborating on the depth of the term *forensis*, which has been narrowed by modernity to these criminological or psychological discourses that are indeed very problematic. In your practice, it apparently refers to a deeper historical context, which could be aligned with Bruno Latour's notion of "making things public," a forum to engage in debates about contested issues. Accordingly, Forensic Architecture is taking measures of human-rights crimes and political controversies by investigations on behalf of civil society. With this kind of critical practice, it becomes apparent that the finding of truth is a matter of public concern and a profoundly political process. How is this approach related to specific formats of mediation, for example, when a project is presented in a semi-public contemporary art context compared to the open access of Forensic Architecture's website?

EW When we present our work or evidence in art and cultural spaces, we often face art and cultural critics saying that this is evidence, not art. Art needs to be freer. Art does not carry the same burden of truth that we seek to carry. Indeed, there is a debate within the field of art about whether our practice belongs there or not. Is it a positive practice, or does it sometimes even have a corrupting influence? When we have shown our work in court, the defence, which is the team that we usually face, says, "Hold on! You are artists. You are not evidence producers. You have shown at the Tate, Whitney, documenta, Venice Biennale, etc. This is not evidence—this is art." I think this shows that, in whatever forum we present, we do not perfectly belong, or we have a certain antagonistic, alienated relation to it.

The gaps could be closed in two ways: on the one hand, as we have seen, through the art world opening up to a certain extent to include our practice as a creative, aesthetic, and critical practice within the domain of media, art, film, and documentary art and, on the other, through the court, which has increasingly started accepting and admitting our evidence as legitimate and admissible in cases. But sometimes, there are frictions and problems, and those are very productive for us. We believe that all institutions in every forum that we address—whether we choose to show our work in *Der Spiegel*, *Neue Zürcher Zeitung*, *The New York Times*, or *The Guardian*—are imperfect platforms with their own biases, histories, and editorial agendas, which we sometimes do not agree with. But we also believe that placing something that does not fit within one forum allows that forum to change—that is our critical practice. We do not think that the art world is the answer to the problems in the legal system regarding the way the law is weaponized and manipulated against the weak. We think the art world has its own institutional and financial problems and biases, which we also address in some of our work. But we do try to offset the limitations in one forum by presenting our evidence in another.

You referred to our website, which is important to note because part of the work is to make public where it has been shown, the response it has garnered, and the influence it may have had. The way we present the work is not simply in the form of a video. We tell you exactly in which forum it has been presented. In the forum section of each case, you usually see a completely schizophrenic collection, including, for example, a human-rights watch report, a European human-rights case at the European Court of Human Rights, in this gallery, that museum, and that newspaper. This shows the non-belonging, the alienation, and the somewhat itinerant way we take the same piece of evidence and put it in different forums. In each one, it does different work because it does not fit. This misfit is also what the kind of system requires in order for it to be digested and understood, it needs to transform.

UF Could you give us an example in this context? I have, for example, been intrigued by the reconstruction of the NSU murder in Kassel, where you worked with a YouTube video in which Andreas Temme, the undercover agent, reenacted his movements through the Internet café for the police with a variety of other information that was collected. The video is apparently based on digital and analog modeling to reconstruct the crime scene and also to correlate the spatial coordinates with the temporal course of the shooting. The footage of this investigative reconstruction was not only presented and framed by public discussions at the documenta 14 in 2017, but I think it was also used as evidence at the trial of the NSU murders at court in Munich. Could you comment on the effects and the precise impact this work had for example in the truth finding in the juridical negotiation of this criminal case?

EW It has indeed cast a shadow on the legal process in Munich. It was invited, then contested, and ultimately it was not presented in Munich. But it was referred to by the lawyers continuously. In her closing speech, the lawyer for the Yozgat family—every victim has had their own legal representation—accused the court of not showing that film in court and, thus, of limiting the judicial question to the guilt or innocence of Beate Zschäpe rather than looking at the wider NSU Complex, as it is called by a group of activists, namely the state and institutional support that the NSU and other neo-Nazi groups in Germany have received. However, when it was presented at documenta, delegations from the Green Party, the Social Democratic Party (SPD), and the Left visited documenta to study the film and invited it to be presented in the so-called *Untersuchungskommission* (investigation committee) in Wiesbaden, the capital of Hesse, where the political aspects of this murder were debated. This decision was contested by the Christian Democratic Union (CDU), which, at the time, was the ruling party and in charge of the *Verfassungsschutz* (German domestic intelligence services) and wanted to deny its presentation before the *Untersuchungskommission*. However, they were not successful, and Andreas Temme himself had to watch it in the *Untersuchungskommission*, which was a very interesting situation:

you have the perpetrator watching his own image, making slights and stupid jokes about it, saying things like, "I'm the main actor. I should get royalties. I should go to Hollywood." So, it has made its political appearance in at least parliamentary inquiries. Our investigation indeed shifted the question. We did not investigate the murder. It was clear that the two Uwes (Uwe Mundlos and Uwe Böhnhardt) coming in through the front door of the Internet café shot and killed Halit Yozgat in April 2006. What was not clear is the way in which the state has dealt with this or how, in particular, a *Verfassungsschutz* agent was allowed by state agents, by his own employers in the *Verfassungsschutz*, not to reveal the truth to the police—to lie to the police. And the *Verfassungsschutz* has put, I believe, a 120-year embargo on the file—classifying it for 120 years—as you know.

UF Yes, this excessive embargo on the inspection of files in the end only fuels the suspicion that a massive failure on the part of the authorities is being covered up. This juridical order appears like a continuation of the deliberate destruction of files on the undercover persons from the Right-wing extremist scene, which was uncovered shortly after the NSU exposed itself in November 2011.

EW I think the fact that the secret service is doing this should concern every German citizen and every European citizen.

UF I agree, absolutely.

EW It should concern, again, any conscientious person with stakes in the matter that the CDU would protect this, would cover this up rather than deal with this shameful moment. So, our investigation is a side-story within the happenings inside this Internet café. We often investigate videos of shootings or beatings or explosions elsewhere, and here we had a leaked video of a reenactment of a crime. Andreas Temme was reenacting how he moved through the Internet café for the police camera and how he was able to miss seeing the body of Halit Yozgat. We thought the reenactment was interesting because it's not only a representation of a crime; it is a crime itself—the crime of perjury, of lying through acting out your movement in space. So, we did not take it as a representation—it's the original crime. We were looking at how he lies, and reenactment is a testimony: it's a testimony that is done with your body and the way your body moves in space, with the camera and the way the camera is positioned. We reconstructed the use of the camera and the movement of the body to show a kind of performative, mediatic form of perjury, which is the political aspect of this murder.

UF The work of Forensic Architecture is apparently based on a stereoscopic practice that includes scientific research methods, reenactment, cartography, and analog and digital modeling in correlation with tracking records of mobile phones, simulations of sound distribution in space and found-footage videos or photographic material—aligned and cross-referenced with witness statements. This entanglement of data evaluations enacted by animations and a voiceover that comments on the reconstruction of the events produces a narrative flow. While the informational level reintroduces methods such as cartography and diagrams that have been criticized as positivistic by means of providing access to the missing links of precarious events, Forensic Architecture always also works with very intriguing aesthetic forms of displaying the research results. How do you define this relation between the adherence to factual knowledge as a normative precondition for truth finding and the aesthetic features of representation, for example, in the exhibition context? Could this constellation be described as an investigative forensic aesthetics that also provides a model for interpretations of factual knowledge? With regard to the growing impact of so-called alternative truth regimes that have overturned the faith in facts in today's societies, Forensic Architecture's techniques obviously stimulate a different kind of speculative imagination. Could the transparent production of evidence also be seen as a way of refuting conspiracy narratives? Forensic Architecture is taking measures of human-rights crimes on behalf of civil society by counter-investigation. After all, the multi-dimensional assembly of facts based on source-critical approaches to documents and verifications of witness statements have also disclosed the blind spots of the investigative authorities themselves. It is a critical engagement that turns *matters of fact* into *matters of public concern*.

EW Indeed, facts do not exist *a priori*. Facts need to be produced, and a form of production of anything, whether it is labor in a factory, news, or fact, is a political act. So, the political question is not whether we accept facts or don't accept facts. The question is how we produce facts and how we contest them today. I would say something quite controversial—I would say that, on the one hand, we can reconsider the challenge of post-truth, and that sounds very weird. Post-truthers are very obstinate about mainstream media, the judiciary, police accounts, sometimes the FBI, and established scientific authority. And very often, I find myself in the same position, contesting the police, contesting things that happen in a kind of politicized media—usually Right-wing media, and so on. So, that is not the question. Contestation is important, but regarding this challenge, this massive challenge to truth, we need not respond to it by buttressing the way in which facts have traditionally been produced and saying we need to believe scientists. Because if the question is whether you believe in science or don't believe in science, you treat science as a transcendent thing. You basically say it occupies a kind of theological position. Of course, then, you know you have the rebels against Rome saying "no," because where power is, resistance lies. The question is: what is now on the ruin of institutional truth; what we need to do; how to establish new ways of truth production; to open up the diagrams of relation, the social relation that produces facts; how to open up the way in which facts are disseminated; and how to open up the way in which they are contested, presented, etc. Now, we go back to the forum. We say we actually need to find other ways to do it, and these are not the ways of the state. They're much more collaborative—it's something that we call "open verification," in which there is always a diagram between the people suffering state repression of violence firsthand and then the people that are next to them, who stand in solidarity with them. And then you have multiple orbits of diffused experts, artists, curators, lawyers, remote sensing

Kassel, Germany
6 April 2006

77 sqm
9:26 minutes

The Murder of Halit Yozgat

"Shortly after 5 p.m., on April 6, 2006, Halit Yozgat was found dead behind the counter of his family-run Internet café in Holländische Straße 82, Kassel, Germany. This was the ninth in a series of ten killings targeting mainly migrant communities, across Germany between 2000 and 2007."

Enver Simşek	09 September 2000, Nuremberg
Abdurrahim Özüdoğru.	13 June 2001, Nuremberg
Süleyman Taşköprü	27 June 2001, Hamburg
Habil Kılıç	29 August 2001, Munich
Mehmet Turgut	25 February 2004, Rostock
Ismail Yaşar	09 June 2005, Nuremberg
Theodoros Boulgarides	15 June 2005, Munich
Mehmet Kubaşik	04 April 2006, Dortmund
Halit Yozgat	06 April 2006, Kassel
Michèle Kiesewetter	25 April 2007, Heilbronn

"The perpetrators were later identified as members of the National Socialist Underground or the NSU, a neo-Nazi group whose core allegedly consisted of three people. The only surviving member of those three, Beate Zschäpe, currently faces a criminal trial in Munich. During the police investigation into the Kassel murder, it emerged that an intelligence agent of the state of Hesse, named Andreas Temme, was present at the shop around the time of the murder. He did not disclose this fact to the police but was later identified from his Internet records. In 2015, many of the police records documenting this investigation—police reports, witness testimonies, computer and phone logs, and site photographs—were made public. Amongst these files was a crucial piece of evidence: a police video showing Andreas Temme's reenactment of his visit to the shop. He sought to demonstrate how he has missed seeing the body of Halit as he exited the shop.

Forensic Architecture was commissioned by the People's Tribunal, a civil society initiative working with the families of the victims, to investigate the validity of Temme's testimony. What time did the murder happen? Where was Temme at that time? Could he not have witnessed the incident? Could Temme's testimony and reenactment be truthful? If not, larger questions could be asked.

Working from leaked photographs of the crime scene, we constructed a digital model of the Internet café. Within those 77 square meters, different actors—the victim, his killers, and a state employee—were architecturally disposed in relation to each other. The shop was thus a microcosm for the larger political controversy that ensued. We reduced the model into its most relevant elements and built it as a full-scale installation at the Haus der Kulturen der Welt (HKW) in Berlin. We then undertook a series of experiments within both the physical and the digital models. Because the murder took place in an Internet café, every witness was connected to a time-coded device: a computer or a phone. We located each digital device in the model and reconstructed a timeline from the login data. This created the space-time matrix within which different possible events could take place.

[...]

We then investigated whether Andreas Temme could have seen the body of Halit as he exited the Internet café. Andreas Temme claimed that he did not see the body as he left the coin on the front desk. Aided by motion detection software and analog measures, we recreated Temme's police reenactment digitally to establish his moving cone of vision. We repeated this test in the physical model with a camera attached to the head of an actor. Witness testimony places the body in this position. We also tested for other positions in which Halit could have fallen. All body positions would have been visible to Andreas Temme as he bent over the counter. Out of the three scenarios, we have determined that scenario one, in which the murder took place after Andreas Temme left the Internet café, is not possible. The evidence does not exclude scenario two, in which Andreas Temme was at the front part of the shop when the murder took place. Scenario three, in which the murder took place while Andreas Temme was still sitting at PC 2, is also possible. In this case, he would have witnessed the event.

This story suggested layers of violence, misrepresentations, and cover-ups. Halit Yozgat was murdered on April 6, 2006. Twenty days later, Andreas Temme reenacted his experience of the event. We reenacted Temme's reenactment to discover it was yet another act of violence, potentially a crime in its own right." (2)

(2)
Title credits and voiceover transcription of excerpts from *The Murder of Halit Yozgat* (2017), video and further information accessible on Forensic Architecture's website, "The Murder of Halit Yozgart," June 8, 2017, https://forensic-architecture.org/investigation/the-murder-of-halit-yozgat.

3

fig. 3 Forensic Architecture, *The Murder of Halit Yozgat*, 2017. A composite of Forensic Architecture's physical and virtual reconstructions of the Internet café in which the murder of Halit Yozgat on April 6, 2006 took place.

4

fig. 4 Forensic Architecture, *The Murder of Halit Yozgat*, 2017. A collection of open-source images and documents that formed the basis of Forensic Architecture's investigation.

5

fig. 5 Shortly after his arrest in 2006, Andreas Temme reenacted his exit from the Internet café on April 6, 2006, still from the original video.

8

fig. 6 Forensic Architecture, *The Murder of Halit Yozgat*, 2017. Digital reconstruction of the desk at which Halit Yozgat was murdered.

fig. 7 Forensic Architecture, *The Murder of Halit Yozgat*, 2017. Computer simulation and motion tracking of Andreas Temme's line of vision in the Internet café.

6

7

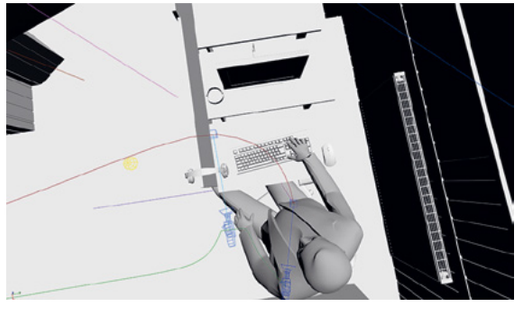
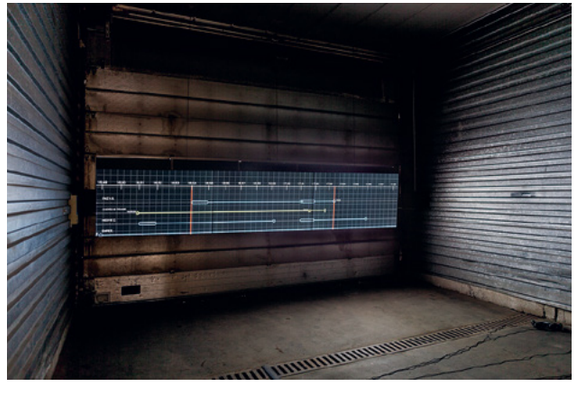


fig. 8 Forensic Architecture, *The Murder of Halit Yozgat*, 2017. Real-scale reconstruction of Halit Yozgat's Internet café at the House of World Cultures (HKW) in Berlin, constructed between March 6–11, 2017.

fig. 9 The Society of Friends of Halit, installation view of Forensic Architecture's *The Murder of Halit Yozgat*, documenta 14, Kassel, 2017. Photo: Michael Nast. This timeline highlights the likely time at which Halit Yozgat was murdered, set against the computer login data of the witnesses in the Internet café.



9

specialists, and artificial intelligence coders, who work in solidarity and create very wide networks of truth production, which are alternative to those of the state. They are based on open-source methods, collaborative methods, and the leveling of the hierarchy between expert and witness. To a certain extent, one can use different aspects, not only technology, in order to do that. I am not saying it's easy; it's always hard work negotiating. But every piece of evidence we produce like that is both evidence of a crime and evidence of the social relation that went into the production of that evidence. That is the most important thing: to find new ways of producing truth, break the barriers between the temple of beauty and the temple of truth, as in science, and find ways to work laterally and collaboratively in establishing the truth.

UF May I direct your attention to the term *architecture* because I find the emphasis on the semantics of architecture in the project's self-definition remarkable. How do you define architecture's role in this discourse of truth production? It seems to relate on the one hand to design tools that are used for architectural modelling, as for example, CAD-technologies for the creation of virtual models of future buildings. On the other hand, Forensic Architecture applies these tools to reconstruct events that have happened in the past. Also, the etymological origin of *forensic* translates as "belonging to the forum," as you explained at the beginning, hence a place not only for the administration of justice, but also a site where controversial matters are negotiated. Does this allude then to the tightly woven network of media, architecture, and the environment that your investigative practice sheds light on? Could you explain this aspect a little more and comment on the importance of the semantic field of architecture for your work?

EW The use of the term *architecture* is a little archaeological in our work, meaning the origin of my work—the very origin of my personal development—is architecture: I'm a trained architect. The project developed through my work as an Israeli anti-colonial activist. My focus was on the use of architecture in buttressing the Israeli occupation of Palestine and Israel's colonization of Palestine via spatial-architectural means and providing evidence for the architecture of the wall; the settlements in the West Bank, in Galilee, in the Negev; and other elements. Slowly, with the evolution of technology, we've moved on to doing other things. However, as in archaeology, there's always a kind of architectural-spatial basis to the work that we do. It is through three-dimensional models that we view the storm of images that we find online. In fact, we think we need to adopt something that we call the *spatial* or *navigational* viewing of videos. Rather than creating edits, *montage*, we move in space between one video and the next. We never cut—never cut—a video that comes to us as evidence. Space becomes the optical device that allows us to see media. Architecture is also a doorway for us to memory. We understand that traumatized witnesses sometimes need to return to the crime scene in architectural models so that they can relive their experience, always with a psychologist, human-rights advocates, or lawyers next to them. Thus, there is a kind of underlying architectural basis to our work. But, as I said, people in the art world say that this is not art, and people in the legal world say that this is not evidence. In the architectural world, people say that it's not architecture. So, I think that it's always that gap that allows us to challenge those vested interests and deep institutional frameworks and open them up—shake them up a little bit. (3)

(3)
The conversation between Ursula Frohne and Eyal Weizman, edited and revised for this print version, was held as part of the video symposium "Taking Measures: Usages of Film and Video Art," 2020, https://takingmeasures.ch/videos/forensis-as-critical-practice/.

"Shortly after 6 p.m. on August 4, an explosion ripped through the port of Beirut. It killed more than 200 people, wounded over 6,500, and destroyed large parts of the city. Forensic Architecture was invited by Mada Masr to examine open-source information, including videos, photographs, and documents, to provide a timeline and a precise 3D model to help investigate the events of August 4. The model is available via this link: https://github.com/forensic-architecture/models.

The first photograph of the warehouse on fire was uploaded to Twitter at 5:54 p.m. We carefully geolocated this photograph by identifying the key buildings and calculated the camera's cone of vision. In this image, we identified the location of the source of the smoke plume at the northeast corner of warehouse 12. Smoke plumes are continuously transforming and have a unique shape at every moment. We modeled the plume at this crucial stage to help synchronize other videos without a timestamp. A video shot around the same time from one of the balconies of the residential tower building shows the same source of fire clearly on the same side of the warehouse. The shape of the plume and the heat source suggest that the fire had evolved. Another video starting at 5:58 p.m. from the nearby St. George hospital provides ten minutes of uninterrupted footage of the warehouse. Within two minutes, the smoke thickens, and its color changes to a darker shade. According to Gareth Collett, a UN explosives analyst we consulted, this suggests that the material burning inside the warehouse has changed. At 6:07 p.m., a new intense heat source appears on the other (northwestern) side of the warehouse, here, followed by a different larger plume. The sparks that follow suggest the presence of small explosive charges, such as fireworks. Thirty-five seconds later, at 6:08 p.m., a large spherical plume appears above the center of the warehouse. According to the explosives analysts, the symmetrical shape of the sphere suggests that it's a single point explosion originating in one particular place within the warehouse, and it's possible that as little as half of the 2,750 sacks of ammonium nitrate stored inside detonated. We use the shape of the two plumes from these explosions as metadata to synchronize the remaining footage. This video, taken from further back, provides an uninterrupted view of the events that followed. Within the span of nine seconds, the spherical plume projected high into the atmosphere. Several tons of particulates thicken the air, and a red-colored plume 755 meters high rose over the warehouse.

We have thus identified four types of smoke plumes emanating from different parts of the warehouse within the space of these fourteen minutes. The first plume, at 5:54 p.m., emanates from the northeast corner of the warehouse. The second plume, at 6:00 p.m., is from the same source point but has a darker color. The third plume appears on the northwest side of the warehouse at 6:07 p.m. The final plume is developed from a spherical explosion located at the center of the warehouse at 6:08 p.m. Each of these smoke plumes, with their distinct shape and color, provides indications of the arrangement of goods in the warehouse, the way the fire developed, and the layout of what was stored inside.

A close-up examination helps in understanding the evolution of fire inside the warehouse. Early footage shows smoke leaking out of every opening, including the windows and the ceiling vents. From this point, at about 5:56 p.m., the temperature inside the warehouse started rising rapidly. The smoke is visible as it changes color to a darker shade in this footage from the east side. We stabilized the footage to reveal the full extent of the warehouse. The sounds of fireworks start being heard at approximately 5:59 p.m. It shows that many windows and doors are shut. According to the expert, confinement creates hot spots, areas of high temperature in which ammonium nitrate can get close to its combustion point. As reported by media outlets, the fire brigade arrived approximately four minutes after an initial call was made to the station at 5:54 p.m. In this footage, taken by the fire brigade on their arrival to the scene, the sound of fireworks continues to be heard.

The 2,750 tons of ammonium nitrate were unloaded to this hangar in October 2014, and as early as December of that year, various port and customs officials warned of the dangers posed by its storage. Many subsequent warnings were issued. In February 2015, for example, a chemical forensics expert commissioned by the Lebanese courts to report on the state of the stored ammonium nitrate described that 70 percent of the sacs were torn open, their content spilling out, and some of the crystals had darkened. Leaked images from February 2020 indicate that the storage conditions had not improved. The sacs were still torn open, and their contents were still spilling out. The bay numbers visible in the ceiling allowed us to locate these bags in bays nine and ten. The images show the presence of a container and a stack of wooden pallets. Another video taken on December 18, released by news outlet Al Jadeed, shows the state of ammonium nitrate bags stored at bay six and surrounding door nine. Stacked ammonium nitrate bags are blocking the entrance. Here, we can see the numbers for bays four and five. On the right of the videographer, between doors nine and ten, a white-colored wall is visible, suggesting the presence of a small service room.

Together these videos and images allowed us to map a total of 243 bags of ammonium nitrate in the space. Given the location of the source of the spherical plume here at bay eight, the remaining 2,507 bags of ammonium nitrate should have been stored here, occupying almost 2,000 square meter of space. But given the haphazard way the visible bags are stored, the space the entire stockpile occupied was likely larger. News reports suggest that in addition to the ammonium nitrate, the warehouse also stored twenty-three tons of fireworks, fifty tons of ammonium phosphate, five tons of tea and coffee, five rolls of slow-burning detonating cord, and 1,000 car tires. Each of these materials burns differently. The combustion of tires, for example, produces a dark and thick plume. According to the explosives expert, it could correspond to the dark plume we had located on the northeast corner of the warehouse, so we placed the tires roughly here. The expert also told us that the white plume that appeared on the northwest side of the warehouse corresponds to the ignition of fireworks. We, therefore, placed the fireworks roughly in this corner.

From an engineering perspective, this is the spatial layout of a makeshift bomb on the scale of a warehouse awaiting detonation. According to Gareth Collett (CBE 2020, CEO and Founder, Brimstone Consultancy Limited): "Ammonium nitrate is extremely difficult to detonate by fire alone. However, when confined and contaminated, this … can lead to catastrophic detonation." It is sensitized by the presence of even the smallest quantity of additives and hence should be separated. We reviewed international standards for the storage of ammonium nitrate. Internationally accepted benchmarks include British regulations. According to British standards, stacks of ammonium nitrate must be limited to 300 tons, and each stack must be at least one meter away from walls and other stacks. Australian standards are more stringent: bags must be arranged in 500-ton stacks but should be stored 890 meters away from the closest residential buildings. Using their equation to calculate safe distances, we can determine that a 2,750 stack of ammonium nitrate should have been stored 1,570 meters away from the closest residential building.

NASA's damage map illustrates the extent of the blast. All these regulations prohibit the storage of combustible or explosive materials such as tires or fireworks in proximity to ammonium nitrate. This fact highlights the substantial and sustained state negligence which led to the formulation of a makeshift bomb. Around 1,000 of the survivors and victims' families have called for an independent investigation and public access to all relevant documents. As the search for political and economic accountability for the explosion of August 4 continues, Forensic Architecture and Mada Masr are making the model, the geolocated videos, and the source material used in the research publicly available via this link: https://github.com/forensic-architecture/models." (4)

(4)
Voiceover transcript of *The Beirut Port Explosion* (2020), video and further information accessible on Forensic Architecture's website, "The Beirut Port Explosion," November 17, 2020, https://forensic-architecture.org/investigation/beirut-port-explosion.

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fig.10 Forensic Architecture, *The Beirut Port Explosion*, 2020. The source of the third smoke plume on the northwest of the warehouse.
fig.11 Forensic Architecture, *The Beirut Port Explosion*, 2020. Layout of bags of ammonium nitrate within the warehouse, as indicated in images from January 2020.

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fig.12 Forensic Architecture team at work. Courtesy of Forensic Architecture.

[redacted]

[redacted]

Appendix

[redacted]

ERIKA BALSOM is a reader in film studies at King's College London, focusing on artists' film and documentary practices. She is the author of four books, including *After Uniqueness: A History of Film and Video Art in Circulation* (Columbia University Press, 2017) and *TEN SKIES* (Fireflies Press, 2021, shortlisted for the Kraszna Krausz prize). Her criticism appears regularly in venues such as *Artforum*, *Cinema Scope*, and *4Columns*. With Hila Peleg, she is the co-curator of the exhibition "No Master Territories: Feminist Worldmaking and the Moving Image" (HKW Berlin, 2022) and co-editor of the books *Feminist Worldmaking and the Moving Image* (2022) and *Documentary Across Disciplines* (2016), both published by MIT Press.

BURCU DOGRAMACI is a professor of 20th-century and contemporary art at the LMU Munich, Germany. Her research focuses on modern and contemporary global art; exile, migration, and flight; urbanity and architecture; photography; and the history of art history. She has been awarded an ERC Consolidator Grant for her project METROMOD (2017–23), which focuses on six metropolises (Bombay, Buenos Aires, Istanbul, London, New York, Shanghai) as exile cities for European artists in the first half of the 20th century, and since 2021 has been the co-director of the Käte Hamburger Research Center "global dis:connect," which examines instances of dis:connectivity in processes of globalization. Her books include *Arrival Cities: Migrating Artists and New Metropolitan Topographies in the 20th Century* (Leuven University Press, 2020, ed. with M. Hetschold et al.) and *Handbook of Art and Global Migration: Theories, Practices, and Challenges* (De Gruyter, 2019, ed. with B. Mersmann). She has also been the co-curator of the exhibition "Eccentric 80s: Tabea Blumenschein, Hilka Nordhausen, Rabe perplexum" (September 9–November 6, 2022) at Lothringer 13 Halle in Munich.

PHILIPP FLEISCHMANN is an artist and filmmaker based in Vienna, Austria. He primarily works with the medium of analog film. For his projects, he often develops site-specific cameras that allow him to reflect on the physical and cultural dimensions of institutional spaces. Since 2014, he has served as the artistic director of the School Friedl Kubelka for Independent Film in Vienna. He has had exhibitions and screenings at venues including the São Paulo Bienal, Macro Museum Rome, Berlinale Forum Expanded, Austrian Filmmuseum, Vienna Secession, Toronto International Film Festival, mumok kino, and Anthology Film Archives, NYC.

URSULA ANNA FROHNE is a professor of art history, modern and contemporary art at the University of Münster, Germany. She received her PhD in art history at the Freie Universität Berlin, worked as chief curator at the ZKM | Center for Art and Media in Karlsruhe and taught as adjunct lecturer at the State Academy of Fine Art in Karlsruhe between 1995 and 2001. Following a visiting professorship at the Department of Modern Culture and Media at Brown University and a professorship of art history at the International University Bremen, she became a professor for 20th- and 21st-century art at the University of Cologne in 2006, where she was chair of the research project "Cinematographic Aesthetics in Contemporary Art" and was awarded the Leo Spitzer Award for arts, humanities, and human sciences for excellence in research. She is a principal investigator at the Center for Advanced Studies in Humanities and Social Sciences "Zugang zu kulturellen Gütern im digitalen Wandel" (2023–27), funded by the German Research Foundation (DFG) and co-chaired the research project "The Sculpture Project Archive Münster: A Research Institute for Science and the Public" (2017–21), funded by the Volkswagen Foundation. She has published on the sociology of the artist, contemporary art practices and technological media (photography, film, video, installation), political dimensions and socio-economic conditions of art and visual culture.

UTE HOLL is a professor of media studies at the University of Basel, Switzerland. A contributor to New German Media Theory, she writes on media historiography, media, and memory, as well as a on the history of science and knowledge as based on audiovisual media or electroacoustic cultures. Her cinema research focuses on a critical history of experimental and anthropological film as well as on questions of digitization and the post-cinematographic. Currently, Holl is leading the interdisciplinary SNSF project "(In)Audible Past" in cooperation with the South African Universities of Fort Hare and Rhodes, exploring acoustic documents as historical sources. Her publications include *Cinema, Trance and Cybernetics* (Amsterdam University Press, 2017), *The Moses Complex: Freud, Schoenberg, Straub/Huillet* (diaphanes, 2016), and the edited volume *Radiophonic Cultures* (Kehrer, 2017). Her essay "Farocki's Cinematic Historiography: Reconstructing the Visible" was published in *e-flux*, no. 59 (November 2017). If there is time, Holl makes documentary and feature films.

THOMAS JULIER is an artist and guest lecturer at the Zurich University of the Arts (ZHdK), Switzerland. He studied photography and fine arts at the Zurich University of the Arts. In his artistic practice, he is preoccupied with the means of digital production and language. He uses a multitude of media including hardware and software development as well as photographic printing techniques, video projection, light programming, digitally aided restoration processes, generic growth patterns, motion tracking, and various methods of digital composition. His projects are often site- and context-specific. His artistic means are ever-expanding through collaborative and experimental processes that systematically transcend his own skills. Interdisciplinary dialog therefore plays a key role in the development of works, projects, and exhibitions. The artist is keen on working with specific spaces, rhythms,

and time, using them for fictitious narratives, speculations, suggestions, and scenarios.

FABIENNE LIPTAY is a professor of film studies at the University of Zurich, Switzerland. She has studied film, theater, and English literature, and has held academic positions at the University of Mainz and LMU Munich. She is head of the SNSF project "Exhibiting Film: Challenges of Format" (www.exhibitingfilm.ch), from which this publication evolved. In 2021, the project was rewarded an excellence grant by the Swiss National Science Foundation. She has published widely on the aesthetics and theory of film, the interrelations between the visual arts and media, as well as concepts and practices of aesthetic production. Her publications include the monograph *Telling Images: Studien zur Bildlichkeit des Films* (diaphanes, 2016), and the co-edited books *Immersion in the Visual Arts and Media* (Brill, 2015) and *Artur Żmijewski: Kunst als Alibi* (diaphanes, 2017). She is also the co-editor of the quarterly series *Film-Konzepte*, published by edition text + kritik.

JACQUELINE MAURER is a junior fellow at the Collegium Helveticum, the joint Institute for Advanced Studies (IAS) of the ETH Zurich, the University of Zurich, and the Zurich University of the Arts (ZHdK) in Switzerland. She studied art history and German philology at the University of Basel (2005–13) and at University College London (2011–12). She was an academic collaborator at the Department of Art Education at the Kunstmuseum Basel (2006–19), assistant, lecturer, and curator at the Institute for the History and Theory of Architecture (gta) at ETH Zurich (2013–19), and a research fellow at the research department of the Institute of Architecture at the University of Applied Sciences and Arts Northwestern Switzerland (2019–22). She received her PhD in film studies at the University of Zurich with a thesis on Jean-Luc Godard and the interrelations between research in film, architecture, infrastructure, and urbanism that was funded by an SNSF Doc.CH grant.

ALEXANDRA NAVRATIL is an artist based in Zurich and Amsterdam and lecturer at the Institute of Art at the University of Applied Sciences and Arts Northwestern Switzerland in Basel. Her work often starts with scientific and historical research on the beginnings of photography, film, and industrial history. By combining and animating found visual material, her works in video, installation, sculpture, and film reflect on the beginnings of modernity and their effects on today's visual world. Navratil was awarded the Manor Art Prize in Zurich in 2013 and the Swiss Art Award in 2009 and 2012. In 2018, she was the artist-in-residence at the Eye Filmmuseum in Amsterdam. Her work has been shown in solo shows at the Kunsthaus Langenthal, Kunstmuseum Winterthur, Stedelijk Museum Bureau Amsterdam, CCS in Paris, Photoforum Pasquart in Biel, as well as in institutional group shows at the Kunsthaus Zürich, Guggenheim Museum Bilbao, Moscow Museum of Modern Art, Fotomuseum Winterthur, Museum für Gegenwartskunst Siegen, CAPC in Bordeaux, Museum Sztuki in Łódź, ICA Philadelphia, and de Appel Amsterdam.

WARREN NEIDICH is a multidisciplinary artist, theorist, and educator working in Berlin and New York. He is the founder and director of the Saas-Fee Summer Institute of Art, based in Berlin from 2005 to 2020, and C.A.R.E. LTD gallery, New York. He is a recipient of the AHRB/ACE Arts and Science Research Fellowship, Bristol, 2004, the Vilém Flusser Theory Award, transmediale, 2010, and the Fulbright Scholarship from the American University in Cairo in 2011 and 2013. His one-person exhibition "Rumor to Delusion" premiered at the Zuecca Project Space during the Venice Biennale 2019 and critiqued fake news and the post-truth society. He is a former tutor at Goldsmiths, University of London, and professor of art at the Weissensee Kunsthochschule. His recent books are *The Glossary of Cognitive Activism*, published by Archive Books in 2019 and *Neuromacht* published by Merve in 2018. Neidich has been a visiting artist at universities such as Harvard, Brown, Columbia, Princeton, UCLA, UC San Diego, Oxford, Cambridge, the Jan Van Eyck Academie, the Dutch Art Institute, the Gerrit Rietveld Academie of Art, the Rijksakademie, and the Sorbonne.

VOLKER PANTENBURG is a professor of film studies at the University of Zurich, Switzerland. He has published widely on essayistic film and video practices, experimental cinema, and contemporary moving image installations. Book publications in English include *Farocki/Godard: Film as Theory* (Amsterdam University Press, 2015), *Cinematographic Objects: Things and Operations* (Matthes & Seitz, 2015, editor) and *Screen Dynamics: Mapping the Borders of Cinema* (Columbia University Press, 2012, co-editor). His latest books in German are *Aggregatzustände bewegter Bilder* (August, 2022), *Peter Nau: Lesen und Sehen: Miniaturen zu Büchern und Filmen* (Harun Farocki Institut/Synema, 2021), and *Handbuch Filmanalyse* (2020, co-edited with Malte Hagener). In 2015, he co-founded the Harun Farocki Institut, a platform for researching Farocki's visual and discursive practice and supporting new projects that engage with the past, present, and future of image cultures.

HANNES RICKLI is a visual artist and professor at the Zurich University of the Arts (ZHdK), Switzerland. He studied photography, the theory of art and design in Zurich, and media art in Karlsruhe. From 1988 to 1994, he was a freelance photographer for various newspapers and magazines. Since 1991, he has staged visual art exhibitions in Switzerland and abroad. In 2004, the Swiss Federal Office for Culture awarded him the Meret Oppenheim Prize Fellowship 2016 to 2020 at Collegium Helveticum, ETH Zurich. His teaching and research focus is on the instrumental use of media and space as well as on media ecology. His research project "Computer Signals: Art and Biology in the Age of Digital Experimentation" (2012–21) was funded by the Swiss National Science Foundation.

DOROTA SAJEWSKA is a professor of theater studies at the Ruhr University Bochum in Germany and a dramaturge for theater and dance. She has held assistant professorships at the University of Zurich and the University of Warsaw. From 2008 to 2012, she was deputy artistic director of the Dramatic Theater in Warsaw. Her interests oscillate between cultural and performance studies, body anthropology, material aesthetics, and the decolonization of knowledge. She is the author of various publications on performance, theater, and visual arts, as well as cultural theory and history. To date, Sajewska has written three monographs: *"Sick plays": Disease/Identity/Drama* (2005, in Polish), *Occupied by Media* (2012, in Polish), and *Necroperformance: Cultural Reconstruction of the War Body* (2016, in Polish; 2019, in English). She has edited issues of peer-reviewed journals, most recently *Theatre and Communitas* of the theater journal *Pamiętnik Teatralny* (2021, in English) and *Gemeinschaftlichkeit/Commonality* of the journal *figurationen* (in German and English, 2023). She published numerous anthologies, recently with Routledge: *Crisis and Communitas: Performative Concepts of Commonality in Arts and Politics* (in English, 2023). Currently, she is running the SNSF project "Crisis and Communitas" (2018–23, www.crisisandcommunitas.com).

BENOÎT TURQUETY is an associate professor at the Department of Film History and Aesthetics at the University of Lausanne, Switzerland. After having led an SNSF project on Bolex and amateur cinema (2015–19), he is now the director of a project about Nagra recorders, between technology, media studies, and sound studies. His publications include *Inventing Cinema: Machines, Gestures and Media History* (Amsterdam University Press, 2019), *Medium, Format, Configuration: The Displacements of Film* (meson press, 2019), and *Danièle Huillet, Jean-Marie Straub: "Objectivists" in Cinema* (Amsterdam University Press, 2020). In his most recent book *Politiques de la technicité: Corps, monde et medias avec Gilbert Simondon* (Éditions Mimésis, 2022), he is looking at technicity as a way of understanding media's relations with users' bodies as well as with geopolitical and environmental ecologies.

MARIJKE VAN WARMERDAM first garnered international attention at the Venice Biennial in 1995 with her looped short films portraying the beauty of simple movements and everyday actions. Her frame of reference is without guile: "Art can give life a twist, and the other way around." She makes use of images where seemingly unrelated elements are united in what comes across as a natural combination. Dramatic shifts of scale, doubling, reflection, rhythmic repetition, or surprising juxtapositions provide an open perspective. In doing so, she draws attention to the beauty of trivialities: the fleeting moments gone in the blink of an eye. Van Warmerdam does not tell stories in her works but relies on the visual power of the motif: a hat dancing in the wind, a girl doing a handstand or a red suitcase sliding down a snowy mountain. Although she utilizes a variety of media including photography, sculpture, and sound installations, she is best known for her short, looped films.

LAURA WALDE works in the communications department at the Stiftung für Kunst, Kultur und Geschichte in Winterthur, Switzerland. Since 2013, she has also been a freelance curator and programmer for the short film festival Internationale Kurzfilmtage Winterthur. She received her PhD in film studies in 2022 from the University of Zurich. Her dissertation resulted from the SNSF project "Exhibiting Film: Challenges of Format," of which she was a member from 2017 to 2021. Her thesis *Brevity, Format, Program: The Short Film and Its Exhibition* takes as its points of departure the short film's brevity, its marginalization in the film theory discourse, and its circulation in different institutional contexts and asks what specific formats the short film and its exhibition assume, and what sort of epistemological potential and impact these formats might have on a cultural, social, and political level.

EYAL WEIZMAN is the founding director of Forensic Architecture and a professor of spatial and visual cultures at Goldsmiths, University of London. The author of over fifteen books, he has held positions in many universities worldwide including Princeton, ETH Zurich, and the Academy of Fine Arts in Vienna. He is a member of the Technology Advisory Board of the International Criminal Court and the Centre for Investigative Journalism. In 2019 he was elected life fellow of the British Academy and appointed Member of the Order of the British Empire (MBE) in the 2020 New Year Honors for services to architecture. In 2020 he was elected the Richard von Weizsäcker fellow at the Bosch Academy. Eyal studied architecture at the Architectural Association, graduating in 1998. He received his PhD in 2006 from the London Consortium at Birkbeck, University of London.

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MIGROSMUSEUM
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The book's title—*Taking Measures*—has a double meaning: as a reference to the practices of measurement and to the political potential of power and resistance. Throughout their history to today, film and video have served as measuring devices for scientific, economic, political and other purposes and have been employed in a variety of fields beyond art. However, in acknowledging these uses also lies the opportunity for art to test its own effectiveness in public space and to uncover potential for resistance in artistic action. In which practices of measurement, of the production of knowledge and evidence in the interest of useful research, are film and video involved? In what way can artistic practice not only make these involvements visible but challenge and test them? How can technologies of measurement in art be used politically and made operative for the public sector? How can formats themselves, as the measures of art, be exhibited? How can they be put in relation to exhibition spaces and their economies of valorization, and how can this relationship be assessed?

With essays by Erika Balsom, Burcu Dogramaci, Philipp Fleischmann, Ursula Frohne, Ute Holl, Thomas Julier, Fabienne Liptay, Jacqueline Maurer, Alexandra Navratil, Warren Neidich, Volker Pantenburg, Hannes Rickli, Dorota Sajewska, Benoît Turquety, Marijke van Warmerdam, Laura Walde, and Eyal Weizman.

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