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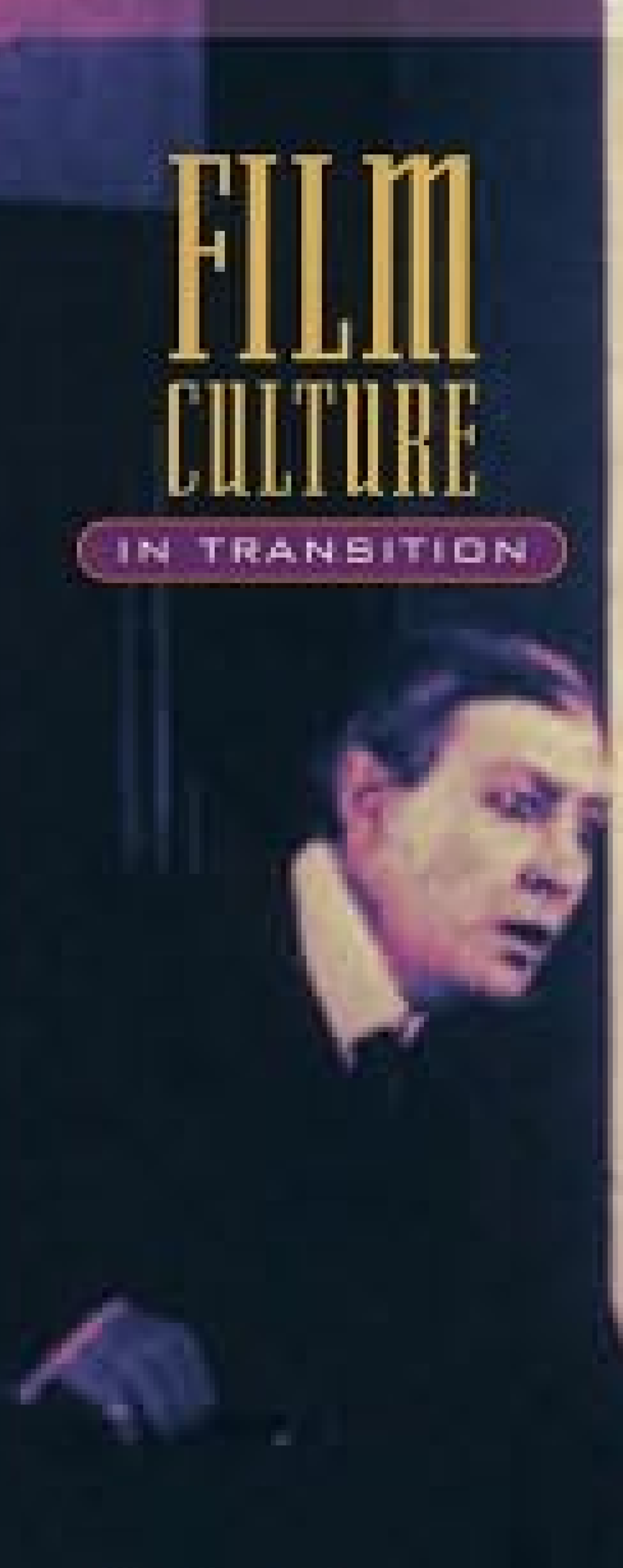

Mapping the Moving Image

GESTURE, THOUGHT AND CINEMA CIRCA 1900

PASI VÄLIAHO

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Gesture, Thought and Cinema circa 1900

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Introduction

This book is about the emergence of the moving image, that is, an image that moves by itself. At some point, self-moving images acquired an intrinsic role in our media ecologies, circulating automatically in such ordinary settings as the mobile phone and the television as well as in more glorious places such as the art gallery or the movie theatre. It is obvious that a wide variety of technological animations of the world have become embedded and ubiquitous in our lives even to the point of confusing demarcations between their own dynamic quality and the dynamics of what they are about.

The chapters that follow will take a genealogical look at the early steps that made these automatic images become an intrinsic part of our experiences, feelings and thoughts, in a word, of our being. The first problem in this endeavor concerns the scope and delineation of the concept in question. Potentially, every image moves, as we learn from myths. Even the statues (*agalmata*) sculpted by Daedalos in ancient Greece were considered to have the ability to walk and run away if not kept fastened, threatening in this way the delineation made in perception between the world and its image.[1] Although Daedalos's works may appear paradoxical to our imagination, the myth itself nonetheless emphasizes the fact that the "moving image" is not a simple term. Rather, it involves questions of the ontological texture of reality and the epistemological weight of perception and experience that travel and transform across the history of Western thought.

In this regard, however, one can distinguish a singular event in the history of our "image-being," which occurred in the late nineteenth century. It was then that images actually began to move in a new way automated by a machine for the recording and projection of moving images, which is generally called the cinema.[2] Images started to move in an idiosyncratic manner, and thus, Golems, which could previously only be imagined in poetry or prose, became flesh on the celluloid.

The focus of this book will be on the development and consequences of the moment when images achieved automatic movement, covering approximately the period from 1870 to 1920. The purpose is to encounter, map and conceptualize this event, and simultaneously to refocus and redefine the cinema as one of the predominant anthropological processes of modernity. How do we then understand the stakes at play in the image's achieving self-motion? First of all, movement of the image can be described in techno-physiological terms, so that it becomes a question of engineering in the very sense of designing and con-

structing machines that harness natural resources. To picture a simple constellation: the film camera registers a series of images at a determined interval, and the series is then projected at a certain speed. When the projection rate is more than approximately 16 images per second, the stream of images triggers a physiological fact, which basically means the human brain is unable to process the intermittent stream and perceive the images separately.[3] This inability to process very small spatial and temporal differences and a certain texture of light and darkness, causes the brain to produce a continuum, an "artificial" or technologically determined block of space-time.[4] The technical system of cinema thus performs a trick on the nervous system. The moving image plays "on the keyboard of our minds," as the psychologist Hugo Münsterberg pointed out in the 1910s, and in this way exploits the nervous system and the brain.[5]

However, this tells us very little about the essential aspects of the moving image. That is because, as Martin Heidegger asserts, "the essence of technology is by no means anything technological."[6] Instead, technology is an ontologically and epistemologically charged mode of revealing. It discloses and by disclosing brings forth; it is a way of letting appear and thus generating being. This also is the essential technological fact of the event of self-motion at the turn of the twentieth century. The technical apparatus of the cinema as well as the neurophysiological one assumed by it imply a technology of the moving image as a mode of disclosing and bringing forth. The emergence of this techno-physiological apparatus entails a singular and historically specific formation of rationalities, bodies and machines. This formation is here tentatively called the moving image and includes sensations, perceptions and thoughts embodied in technical arrangements, artistic forms and figures, scientific formulas, and concepts. The important point is that the moving image discloses and brings forth the world in a manner specific to itself. Thus, the emergence of the moving image amounts to a particular kind of beginning and modulation, consisting of a variety of elements ranging from scientific and philosophical articulations to filmic expressions and technical configurations that become layered into a constellation of many voices and faces. It is precisely in terms of such a polyphonic process of organization that Gilles Deleuze describes the event.[7] The event is a coming-into-being of things and entities and thus denotes, not structure, but both variation and the generation of consistency.

Our aim, using this premise, is not to provide a historical treatise on the development of filmic expression and styles or on the reception of cinema in culturally specific settings. It is rather to lay out a map – and inevitably a partial one – of the implications that the cinematic medium has had on our capacities to experience and think about the world. If the event encompasses the emergence of being, mapping describes and conceptualizes the forces and powers involved in the event, ones that primarily plot and organize the configurations of what

we can see and say about the world. In outlining the theoretical and methodical stakes at play in the work of his colleague Michel Foucault, Deleuze understands cartography precisely as the practice of illustrating and analyzing the microphysics of power and political investments of the body.[8] In this sense, cartography traces the forces that, in a given social field, bring forth, combine and regulate the conditions of *seeability* and *sayability*, the visible and the articulable. Cartography consists of the activity of mapping the forces that make up our reality. Deleuze calls the diagram such an informal force that gives rise to historically relative forms of expression and content. The diagram is a "spatio-temporal multiplicity," which gives rise to the forms and figures that create the reality we have.[9] Deleuze describes it as something that, instead of representing reality or being the subject of history, "produces a new kind of reality, a new model of truth."[10] Moreover, the diagram "makes history by unmasking preceding realities and significations, constituting hundreds of points of emergence or creativity, unexpected conjunctions or improbable continuums."[11] In Deleuze's interpretation, the activity of mapping turns into the illustration and analysis of the forces of change, of the diagrams that direct, locate and create a pattern of how the world turns out.

This is also what we mean by embarking on "mapping the moving image." We attempt to focus on the moving image as a diagram in the above sense, that is, as a force of change which, instead of representing history, makes history happen by organizing perceptions and prescribing actions – and thus "doubles history with becoming," to paraphrase Deleuze.[12] Instead of looking primarily at the forces that founded cinema, we approach the moving image as a force itself, one that has quite significantly shaped the world we live in. In *Cinema 1*, Deleuze characterizes the moving image as a "bloc of space-time," which clearly resonates with the notion of diagram as a "spatio-temporal multiplicity."[13] Cinematic aesthetics, in other words, already call for a sort of cartographic function. This is what Tom Conley argues in *Cartographic Cinema* while conceptualizing the cinema as a mode of cartography. Conley makes a direct correlation between the diagram (in the Deleuzean sense) and film: "As a diagram, too, given its 'spatio-temporal multiplicity,' a film would be an exposition of relations of force, not just in what is seen on screen but also in the greater space of its projection or emission."[14] On the one hand, cinema exposes the forces prevailing in the social context in which it is embedded; yet, on the other hand, cinema may also turn into a force itself and thus become coextensive with the social field in which it operates, plotting behavior and perception within a certain arrangement of power. As Conley suggests, "The beauty of the cinematic diagram resides in the way its own causes at once stand coextensive with and even 'program' the reality that would be the sum of its effects."[15] In other words, the event of the moving image, which causes the coming-into-being of

"something," cannot be separated from its effects. Understood as a diagram and a force, the moving image programs not only the reality it shows and exposes directly but also the reality it leaves unseen, that is to say, the reality it implicates in its operations. It does so by creating new perceptions and articulations, new connections of affectivity and modes of thought, and by making others obsolete and disconnected. These connections and disconnections are the subject of this book.

Rhythm

Specific to the event of the moving image – the emphasis being on the word "moving" that suggests process and change – is that it affects and disseminates novel configurations of temporality, as has been recently shown by Mary Ann Doane.[16] In her work, Doane concentrates on the representability of time in the film medium, discussing questions of instantaneity and the problematic relationship between chance and order as they became manifest at the turn of the twentieth century. In our "diagrammatic" approach, we shall rather focus on the ways in which the moving image harnesses, expresses and coordinates time in its various forms. A crucial concept in this context is that of rhythm. That is because rhythm modulates and coordinates various temporalities. Furthermore, the concept of rhythm aptly incorporates the two basic features of cinematic aesthetics, namely, movement and duration. Thus rhythm is an important analytical concept when mapping the "programmings" of behavior and perception, which the moving image implemented circa 1900.

The concept of rhythm has a history of its own in film scholarship. Most recently, Yvette Bíro theorized filmic expression in terms of rhythms giving rise to diverse kinds of temporal forms and layers.[17] For Bíro, rhythm is a force that organizes various, even contrasting, elements into an expressive whole, a recognizable pattern, thus creating unity and meaning. Similarly, Jean Mitry, in the 1960s, pointed out the importance of the notion of rhythm when approaching the cinema as a time-based art.[18] Like Bíro, who stresses that rhythm is not only the indicator of duration, Mitry posits that rhythm in the cinema should not be understood as a simple matter of metrics but as something that gives rise to relations of duration. In this sense, cinematic rhythms are not measures of time but rather contribute to our perception of time and the duration of things and events. Rhythms assign their temporal qualities to things and events. On the other hand, the association of the moving image with rhythm has its roots in numerous early film theories. The medium of cinema was described as something based on the power of organizing and shaping especially the rhythms of

life and bringing forth new kinds of emotional and intellectual qualities in the writings of Abel Gance, Germaine Dulac and Hans Richter as well as Soviet montage theorists. Dulac, for instance, believed that it was fundamentally visual rhythms that gave "cinegraphic movement" its ability to appeal directly to our emotions and arouse them.[19] Dulac associates the cinematographic image mainly with music and its emphasis on "pure" duration and process (as opposed to narrative development), arguing that "[t]he rhythm and the magnitude of movement in the screen space become the only affective factors."[20] In a similar vein, Sergei Eisenstein writes that rhythm in the cinema is "a maximally generalized depiction of a *process* within the subject matter, a graph of the changing phases of contradictions within its unity."[21] In Eisenstein's treatment, the rhythmic function of the image, as performed by the technique of montage, amounts to generating perception and sympathetic feelings.

In these early takes, the moving image is perceived in processual terms as rhythms of affectivity and perception. This is also what Mitry means when he associates rhythm with affective, dramatic and psychological intensities that are involved in our perception of duration.[22] To approach this issue from another angle, we can point out how in 1911 the writer Jules Romains was also hinting at the importance of rhythms in cinematic embodiment in his essay "The Crowd at the Cinematograph," comparing the cinematic experience to a "group dream." In the cinema, he writes, "Creatures seem gigantic and move as if in a hurry. What controls their rhythms is not ordinary time, which occupies most people when they are not dreaming. Here they are quick, capricious, drunken, constantly skipping about; sometimes they attempt enormous leaps when least expected."[23] The cinema, Romains seems to suggest, creates its own sphere of rhythmic being that requires a mode of assimilation in experience in which our corporeal rhythms become those of the silver screen. This is something he sees as a novel configuration of corporeality, where the visual rhythms and extraordinary durations of films are lived as potential action within the audience's affective bodily interior.

Rhythm thus becomes associated with the cinema's investment in sensory dynamics and is understood as the force that binds the spectator to the screen. Münsterberg, who as an experimental psychologist must have been sensitive to technological modulations of physiology, writes about film in a very similar vein:

> rhythm of the play is marked by unnatural rapidity. As the words are absent which, in the drama as in life, fill the gaps between actions, the gestures and deeds themselves can follow one another much more quickly… This heightens the feeling of vitality in the spectator. He feels as if he were passing through life with a sharper accent which stirs his personal energies.[24]

Münsterberg indicates that rhythm in the cinema is neither a metric principle nor is it necessarily a visual one. It is more of a felt energy, an intensity of sensation in the intervals of gestures and actions. As Deleuze described it, rhythm is sensation on a "molecular" level, where one is moved (in both the physical and psychological senses) by the force of the image that is not itself an object of perception.[25] One is moved by the intensities that the rhythms of the image distribute. Rhythm, it could be said, is the primary factor upon which the force of the image – also considered the force of change and becoming – is based on.

In wider cultural settings, this focus on the affectively transformative rhythms of the moving image echoes various modern technological and economic developments based on the proliferation of new technologies of speed as well as the processes of urbanization and industrialization.[26] The train and the automobile as well as the telegraph each emphasized mobility, change and the fragmentation of sensation that rendered our perception of time and space as discontinuous. As a response to the problematic of acceleration and fragmentation, it was during the era that the concept of rhythm acquired a central place in conceptualizations of human psychology, social behavior and physiology. Bodily and mental dispositions were mapped in terms of a network of organic rhythms that inscribed, organized and formed both individuals and groups.[27] For example, Thaddeus L. Bolton in an 1894 article aptly entitled "Rhythm" proposed that rhythm is a universal "phenomenon in nature and in physiological activity," and, importantly for the psychologist, rhythms also hold the key to the analysis of emotions and attention.[28] For Bolton, diverse kinds of rhythms and their relations extend from the cosmos to the human body and consciousness. The composition of the body, which is itself essentially embedded in larger rhythmic environments, comprises a complex web of tempos, cycles and repetitions – including the heartbeat, respiration, walking, the circulatory system, nervous reactions, and fatigue. The body becomes increasingly seen as something processual and productive. Not coincidentally, rhythms also became key elements in the analysis of labor and efficiency, and the new rhythmic perception of the body was thus coupled with the productive requirements of capitalism.[29] Furthermore, one issue that emerges in these conceptualizations concerns the "contagion" of rhythms within and between individuals and groups based on the suggestive power that especially bodily movements and gestures have on us.[30] This was also one of the principal modes of how early cinema screens addressed their spectators; as one of the first "meta-films" on cinema experience, Edwin S. Porter's Uncle Josh at the Moving Picture Show (Edison Manufacturing Company, 1902), displays with the comic character who becomes immersed in the cinematic spectacle and dances along with the figures on the screen.

As these conceptualizations that coincide with, or directly apply to, the cinema already suggest, the notion of rhythm does not point solely to film aesthetics, but also inscribes the medium within larger social fields and configurations of power in modernity. While the cinema, in its aesthetics and technology, introduces novel rhythmic renderings of our bodily and psychological processes and our affective and perceptual capacities, it also opens these processes up to the expansion of organization and control. Cinematic rhythms are, like any rhythm, repetitions that create new modes of being, but also ones that bind and captivate.

For a more nuanced understanding of the concept, we turn to Gilles Deleuze and Félix Guattari, who approached the emergence and sedimentation of (animal or human) cultures in terms of rhythms, milieus and territories.[31] Deleuze and Guattari define milieus as blocks of space-time constituted by periodic repetition, whereas rhythms are what coordinate these heterogeneous space-times. Rhythms are thus not simply repetitions or measures but, instead, produce differences between milieus, that is to say, differences by which milieus may interact with each other and communicate. In other words, rhythms are differential. When a rhythm becomes expressive, acquires quality, it marks a territory. Territory signifies distantiation and thus forms the basis of cultural activity. Territory separates, in human cultures between me and you, us and them, mind and body, human and divine, here and there, now and then, for example. These are basically spatiotemporal separations. Deleuze and Guattari in part based their theory on the prehistorian André Leroi-Gourhan's notions of the creation of specific space-times that operate via our becoming distantiated from natural rhythms like those of stars, the seasons and days, as well as those of the body. "Upon these nature-given rhythms," Leroi-Gourhan writes, "we have superimposed the dynamic image of rhythm created and fashioned by human gestures and vocal emissions and, lastly, the graphic records inscribed by hand upon bone or stone."[32] Leroi-Gourhan notes that as soon as a material and functional element in a milieu such as a physiological organ, sound or a stone becomes expressive, a territory is created. Gestures arise that paint and faces speak. Crucially, natural rhythms become expressive and begin to mark an emerging culture through different media, basically, image, sound and writing. The media disclose and bring forth new kinds of pulses and thus are essential elements in the creation of bodily and cognitive capacities.

The notion of rhythm comes then as essential to understanding the effects of the moving image in cultural change. The crucial point to note here is that images animated in the cinema can be seen as constellations of rhythms that shape and arrange our existential territories and forms of life, how we engage in individuation and differentiation as corporeal, psychic and collective beings. From this viewpoint, we can pinpoint the anthropological and ontological im-

portance of the medium that has so much defined the twentieth century. According to the "rhythmic" approach, the moving image appears as a dynamic, creative event of disclosure and capture. The moving image is considered in terms of modulation and reorganization in the rhythms of human existence, which relate to the corporeal and intellectual ones by which we connect to the world but are simultaneously separated from it as well. It engages in the creation and repetition of singular rhythms according to which the world becomes something that is experienced and known.

Importantly, the concept of rhythm also influences our theoretical framing of the moving image, shifting the attention away from the notions of gaze and representation, which have been common elements of film theory since the 1970s, to dynamic modulations that emphasize the image as encompassing material and psychic intensities and fields of individuation based on repetitions and differentiations.[33] Rhythm underscores the morphogenetic aspects of the moving image in its capacity to modulate movement and perceive time, while referring to the ways in which the medium gives rise to new forms of embodiment, action and thinking – simply put, it creates a new kind of consistency. What the cinema introduced to visual systems was movement and, consequently, a novel potentiality for immanent production and unforeseen consequences. As Thomas Elsaesser has pointed out, the question of visuality in cinema starts by pertaining to events that create contingent connections and disjunctions, emergent patterns, rather than by concentrating on the image as a mere mirror of our meanings and intentions.[34] The focus is the intense dynamics of the image, that is, the ability of the image to generate affectivity, logics of sense, and modes of thought. As Patricia Pisters observed, "images (cinema included) are realities in their own right, not something of a second order."[35]

Gesture and Thought

The moving image first of all emerges as a certain bodily crisis at the heart of modernity in which the rhythms of the new medium become expressive in a rather singular way. According to Giorgio Agamben, the development of cinema became increasingly reflected in the occurrence of *nervous gestures* and their scientific scrutiny by the end of the nineteenth century.[36] Referring to Gilles de la Tourette's observations of walking disturbances in the 1880s, Agamben notes a mode of vision that "is already a prophecy of what cinematography would later become."[37] This vision minutely scrutinizes and cuts up the gestures of walking in a frame-by-frame manner. What it discloses are fitful, uncontrolled

bodily rhythms and the lack of motor coordination visible in various kinds of tics, spasmodic jerks, and mannerisms, a clinical profile of what would later be called Tourette syndrome. In Agamben's analysis, however, these nervous gestures are not solely a matter of medical history, but more fundamentally, also embody changes in our cultural being brought about by cinema. Agamben suggests that cinema realizes a certain kind of modulation of bodily dynamics and also generates dislocated and erratic gestures in focus, a serious alteration of our corporeal rhythms. This aspect will be further developed in the course of this book, focusing on how the phenomenon of nervous gestures epitomizes the modulations and disturbances in corporeal rhythms that the moving image effects.

Pascal Bonitzer argues that "the only currency" of cinema during its earliest steps was "that of gesture."[38] Similarly, Agamben asserts that the gesture is the basic expressive element of cinema. Based on these conceptualizations, one could say that the moving image is gestural by nature. It takes not immovable and rigid forms but material, bodily dynamisms as its subjects. This can be seen in early film's attachment to and even obsession with uncanny, mechanical and nervous gestures as demonstrated by George Méliès's or the Edison Manufacturing Company's "single-shots" as well as the *Doppelgängers* that haunt the German cinema of the 1910s and 1920s. This obsession highlights the particularity of cinematic embodiment based on how the new medium transposes the living being, its affects and actions, into its mechanics by automating its functions.

Generally speaking, the gesture is not simply bodily movement but "a manner of carrying the body," as the *Oxford English Dictionary* defines it. It is a corporeal rhythm that has become expressive, a rhythm of quality. Michel Serres points out that the gesture signifies a separation from genetic automatisms (a distantiation from the purely biological milieu that occurs among human as well as other animals).[39] The gesture can thus be seen as a very basic mode of distantiation and separation. Instead of being merely a means of communication, it imparts a sense or "feeling" of demarcation, which is a vital process of psychogenesis at the source of life. For Leroi-Gourhan, who makes extensive use of the concept (never straightforwardly defining it, however), the gesture operates in close relation to tools: both are sequentially organized into an operational synergy by employing a "syntax."[40] They form an "operational sequence" (*chaine opératoire*), a series of actions, which transforms matter from one state into another. With animals, tools and gestures are often combined into a single organ: "The crab's claws and jaws are all of a piece with the operating program through which the animal's food acquisition behavior is expressed."[41] From this starting point, tools become exteriorized as in human behavior: the hand is exteriorized when it holds a hammer, for example. Finally, in modernity,

both tool and gesture become embodied in machines – which also includes the cinematographic machine.[42] Leroi-Gourhan's notion of gesture points to the role that technique plays in the general "history of life."[43]

Changes and developments in corporeal and intellectual capacities are fundamentally a matter of programming these capacities as tools and machines. In this respect, it is important that Leroi-Gourhan attributes no finality to technique itself; technique has no predetermined goal.[44] One could say that technical gestures, which amount to various modes of psychogenesis, are means that nevertheless have meaning in themselves, certain kinds of functions independent of any ends. They refer to their own mediality or their media character as openness.[45] As Brian Rotman notes, gestures draw their affective force and psychosocial meaning by virtue of their occurrence as events.[46] The programming of gestures in media technologies modulates our corporeal and intellectual capacities immanently in the fact that gestures take place, how they happen and in the process of their becoming expressive.

In this way, the crisis of gestures implicated in the emergence of the moving image can be understood in terms of changes occurring in the history of life, changes that incorporate bodily rhythms such as breathing, the heartbeat and walking, for instance. Nervous gestures signal how the body becomes caught in a novel type of medial arrangement in the cinema, as well as the occurrence of a new form of life that the technology of self-moving images implies. They reveal cinema not only as "the intensification of nervous life," to quote George Simmel's famous characterization of the status of experience in modernity, but more fundamentally, as a technology that becomes the very stuff of life.

Walter Benjamin, as is well known, was among the earliest scholars to notice the importance of cinema as one of the serious psycho-physiological challenges in modernity. Regarding "the basis of the rhythm of reception in the film," Benjamin notes that the individual in the cinema is subjected to technological bombardment of the sensorium that increases in velocity and intensity, and gets caught in "a series of shocks and collisions. At dangerous intersections, nervous impulses flow through him in rapid succession, like the energy from a battery."[47] Benjamin compares the repetition of cinematic spectacles to that of automatized gestures and purely reflexive actions, which, according to him, were disseminated from industrial work processes outward to larger cultural arenas. What is important here is that the cinematographic image thus appears like an energetic field that directly involves our bodily dynamics and also affects our perception and agency. Tom Gunning has subsequently problematized early cinema from a similar angle with his concept of a "cinema of attractions" that develops the notion of the moving image as a medium with the impulsive and the affective as the primary mode of address.[48] The context here is not only the internal development of film but larger mutations in modernity, when images

began acquiring new functions related to direct physical stimulation and perceptual manipulation.[49] In a similar vein, Rae Beth Gordon has recently disclosed early cinema's intimate relation to corporeal pathologies and nervous gestures, showing how the cinematographic image yields corporeal submission in its technological aesthetics.[50] In this case, as Lisa Cartwright has also pointed out, cinematic gestures appear to be programmed within the medical practices and scientific perceptions of the era in which modern forms of power started to invest heavily in the body.[51]

The problematic of nervous gestures that the cinema incorporates thus implies broader socio-technological arrangements of modernity. Jonathan Crary rightly points out that, "What we familiarly refer to, for example, as film, photograph, and television are transient elements within an accelerating sequence of displacements and obsolescences, part of the delirious operations of modernization."[52] For Crary, these operations revolve around the annexation and organization of bodily and psychic capacities within capitalist circles of production and consumption. In creating spheres of accelerating consumption, new image technologies circa 1900 also amounted to putting up novel systems of perceptual transformation and sensory adaptability. In this configuration, cinema is a technology that captures, quantifies and reorganizes – in a word, diagrams – our bodily dynamics, marking thus a considerable transformation in how we comprehend the world around us. It implements a particular kind of bodily cartography that programs the gestures by which we differentiate ourselves from our surroundings. Friedrich Kittler points out that, as far as modern science and aesthetics, the world is no longer coded and bound up in the symbolic realm of signification. Instead, the seeable and the sayable boil down to the functioning of technological media that select, store, and produce senseless physical realities themselves.[53] What counts in particular is that in cinema, the nervous system's sense of time, in its contingency and singularity, becomes a variable that can be spatially mapped and manipulated.

Thus the moving image situates itself at a certain threshold that has been employed throughout Western thought to define the human animal. This is the distinction between voice and language, which for Aristotle, among others, embodies the separation of politics, the properly human *bios*, from so-called natural life or *zoē*.[54] Aristotle believed that only the animal capable of language – *to zōon logon ekhon* – is capable of a political and good life. Thus, politics fundamentally embraces the fulcrum of Western metaphysics regarding the simultaneous conjunction and disjunction between the animal and *logos*, body and thought, bare life and political existence.[55] However, as Michel Foucault has shown, this threshold in modernity becomes reorganized, as natural life becomes both the object and the subject of political operations. Foucault is referring to the "entry of life into history" in the sense that "phenomena peculiar to

the life of the human species" enter "into the order of knowledge and power, into the sphere of political techniques."[56] The crisis of gestures expresses a crucial shift so that the living being gets caught up in novel networks of power characterized by Foucault in terms of biopower, one that introduces life "as such" under the workings of governance. Gilles de la Tourette's perception already hints at larger developments within which the living being *qua* living becomes drawn into a rationality that wants to take care of life – to direct, multiply, calculate, modulate and thus control life itself – and distribute it in the domain of value and utility in terms of (re)action and reproduction, that is, in terms of work and procreation. Life as such, the simple fact of living, which the Greeks called *zoē*, becomes inseparable from political life, *bios*, as the privacy, even secrecy, of life appears to be open to observation and control.

Agamben refers to this form of life as "bare" or "naked" (*la nuda vita*).[57] This is also the form of life that the cinema implicates in its mechanics, as we shall mainly develop in chapters 1-3. We will track this aspect of the event of the moving image down to the cinema's genealogy in experimental physiological and psychological laboratories, where the cinema *qua* technology of movement emerges as the immanent modulation of the dynamics of the nervous system, physiological disposition, and affective life of sensations. In this context, the cinema puts up a techno-scientific zone of indistinction between *zoē* (private, intimate) and *bios* (public, open), which programs modern technical gestures. Fundamentally, these are also the gestures that the early cinema of attractions takes as its subject in various styles and forms, ranging from the nervous and curiously decomposing bodies of Méliès's performative cinema to experiments on perception in actuality films. In one way or another, the moving image seems to be a specific type of shaping and organizing of our corporeal capacities, which obscures the difference between our sense of self-motion and spontaneity of our bodies and the perception of automatic movement on the silver screen. Furthermore, engaging vital bodily rhythms such as breathing and the heartbeat, cinema creates circuits of affection and action that result in a specific type of psychogenesis, ones within which a new type of "living being" is individuated.

However, by taking a cue from early film theorists, we can note that there is also another dimension to these developments and other kinds of programming involved in the event of self-motion circa 1900. Writers as diverse as Antonin Artaud, Germaine Dulac, Sergei Eisenstein and Jean Epstein have emphasized that, in addition to the intensive and "neurasthenic" corporeal dynamics it is related to, the cinematographic image also recasts how we apprehend the world and ourselves in thought. The cinema is not only about shaping our affective investment and forms of life but, equally importantly, it also changes how we consider reality at a conceptual level. Artaud's views on cinema reflect this in an interesting manner. For him, the moving image plays out its biopolitical voca-

tion in its direct influence on our neurophysiological being. Through its rhythm and speed, Artaud writes, "The cinema is an amazing stimulant. It acts directly on the grey matter of the brain."[58] However, by the same token, Artaud also thought that the cinema amounts to a "turning-point in human thought, when language loses its symbolic power and the mind tires of a succession of representations."[59] What the poet considers the "virtual power of the image" produces a shock to thought processes and thus opens up new modes of thought freed from previous forms and models. Sergei Eisenstein, on the other hand, attributed a similar power to the cinematographic image, not just on the unconscious level but also on a level that pertains to conscious operations. In his typology of various types of montage, Eisenstein proposed that cinematic rhythms based on the material interactions of images can take the higher exercise of thought as their subject, which applies to conceptual reasoning, for instance.

Surely these writers' ideas can be considered speculative and quite problematic. However, what we can learn from them is that cinematic visuality may also extend from dynamic embodiment to the encompassing of noetic configurations. The moving image does not only tear open the surface of the body and its affective texture, but it also cuts into the density and opacity of thought. In other words, in addition to the biopolitical investment in the body, which is tangible in various scientific perceptions and in the affective forms of early cinema, the moving image developed as a certain kind of potentiality of intellection. Perhaps we can even regard cinema as the essential twentieth-century model or, rather, diagram of how we make sense of and conceptually understand the world we live in. From this perspective, the moving image amounts to a cartography of thinking, providing a map with which we find our bearings in thought. This is an image that directs our fundamental perception of what the world is made of, that is, our apprehension of the constituents of reality.

Chapters 4-6 provide a cartographic approach based on this hypothesis. Their primary focus is on the noetic potential inherent in the moving image that is analyzed in terms of how the image's kinetic and temporal dynamics became manifest in conceptual shifts and changes in thought at the turn of the twentieth century. The purpose is to map the ways that the moving image actually recast certain key conceptualizations in Western thinking that have subsequently had a strong influence on how we relate to the world and to ourselves. This will be approached through filmic examples as well as through forms that, at first sight, one might perhaps not expect would be examined so closely in a study on the "moving image" – spanning the writings and diagrams of Sigmund Freud, Friedrich Nietzsche and Henri Bergson as well as examples from the era's literary works and visual culture. The importance of these thinkers to modernity, concerning, for example, what it means to be human or the ontological importance

of time, has been well documented previously. But our focus will be on the role that the moving image has played in these developments, and what interests us is how these examples disclose the ways in which cinema has let the world appear in thought in fundamentally new ways. A case in point is the novel perception of the "psychic reality" in Freud's thinking, where the moving image plays a central role in conditioning some of the basic epistemological assumptions involved in the nascent science of psychoanalysis. On the other hand, a certain kind of cinematic dynamics is at play in the work of both Nietzsche and Bergson, as they reconfigure Western thought regarding the concepts of duration, difference and repetition. We shall see how in each of these cases the moving image turns into a rhythm of thought that concerns, in one way or other, new configurations of temporality, that is to say, the temporal texture of the world and the epistemological and ontological importance we assign to it.

Art, Science, Philosophy

It may now be evident that this book is not only about the world of films, at least in the explicit sense of the worlds that films exhibit. Rather, it is about the world that cinema implies. When understood in terms of intensive, differential rhythms, the moving image ramifies into several areas of reality, which it simultaneously programs. To unravel these phenomena, our analyses will discuss scientific texts, philosophical conceptualizations as well as literary figures and other artistic forms as well as films and film scholarship. Toward this end, we model the rhythms of the moving image in terms of three capacities pertaining to sensation, knowledge, and conceptual thought, which draws on the distinction that Deleuze and Guattari made between three types of both corporeal and intellectual rhythms in terms of art, science, and philosophy.[60] Each of these rhythms is characterized by a mode of expression. In Deleuze and Guattari's taxonomy, art produces affects and percepts (blocks of sensation), science generates functions and propositions, whereas philosophy creates concepts. Secondly, each lays out a specific "plane" or territory that the creation of affects and percepts, functions and propositions, and concepts presumes and simultaneously traces. Art operates on a plane of composition, which is most closely connected to the animal world: it channels matter into sensible and qualitative compositions (a song, a shape). Science extracts a system of coordinates from the world, which becomes the plane of reference, a set of states of affairs, for functions and propositions. Philosophy for its part supposes a plane that does not concern sensation in terms of reference or composition of sensible qualities. It lays out a "plane of immanence," which is fundamentally about the ontologi-

cal texture assigned to the world in conceptual operations of thought. This plane is drawn by concepts that, according to Deleuze and Guattari, relate not to states of things or to unformed matter but to the intimate sense of a thing or being.

This book will "transversally" map the moving image at the intersection of these territories of cultural activity without reducing it to any specific one among them. In our view, the moving image belongs simultaneously to the planes of composition, reference and immanence, whereby it turns into a singular kind of rhythm which for its part, according to its "tempo," shapes the organization of affects, percepts, functions, and concepts. Furthermore, it is at this intersection that the moving image itself acquires its contours and may thus be framed as an object of analysis. As one might suspect, however, these are only transitional contours that we can ascribe to the processual variations that the moving image involves.

When modeled and mapped according to artistic, scientific and philosophical activity, the moving image is identified as a "theoretical event," one that occurs in confrontations between theoretical conceptualizations and objects (actual films, shots, pictures and texts). In this respect, let us make a conceptual clarification: the moving image must be analytically separated from what is called the cinema.[61] The cinema is understood here as an empirically determinable techno-aesthetic system of moving images. In this sense, the cinema encompasses, among other things, the development of diverse technical arrangements (from chronophotography to the cinematograph, for example) along with various modes of expression and styles. The moving image, on the other hand, becomes considered a constellation of corporeal and intellectual rhythms, that is, potentialities of differentiation as expressed in art, science and philosophy circa 1900. In this way, the event of the moving image is approached as "ideal," or to put it more precisely, diagrammatic, rather than purely empirical. The diagrammatic here covers, as already noted, the generation of being. It embodies a multiplicity of differential relations or tendencies that direct processes of the world's realization; it defines the ways in which the world turns out.[62] So, what we are mapping is the diagram rather than particular historical facts. Furthermore, in our approach the activity of mapping also turns into the creation of concepts through which this book is to articulate various differentiations effectuated by the moving image insofar as they become manifest in actual affects, percepts, functions, and concepts during the era. These concepts are: modulation, experimental life, *Umwelt*, the paradox-image, the differential image, and the virtual image. Each of them presents a critical point for navigation in thought, disclosing certain directions while obscuring others.

To put it succinctly, this book presents the moving image as a strategic term employed in the carving out of the role that various arrangements of visuality,

movement and duration have played in the development of corporeality, perception, and modes of thought in cinematic modernity. The following chapters, which are titled after the key concepts developed in this study, present interrelated perspectives on these arrangements. Readers are welcome in the course of reading this book to create their own maps by laying out the concepts on a two-dimensional surface and rearranging them as they wish.

1 Modulation: On Cinematic Gestures

Nervous Gestures

It is the movement and more precisely the experience of the self-movement of our bodies that our sense of agency, our perception, and our consciousness rest on and derive from. As Maxine Sheets-Johnstone suggests, bodily movement is the primary factor in the ontogenesis of subjective and intersubjective worlds alike. "Original kinetic spontaneity that infuses our being and defines our aliveness," she writes, is "the foundation of our sense of ourselves as agents within a surrounding world. But it is even more basically the epistemological foundation of our sense of who and what we are."[1] With the emergence of the moving image, something happens to that fundamental experience. As early accounts of images invading the auditorium have pointed out, for example, the cinema takes hold of the animate body by which we prehend and apprehend our surroundings as well as the dynamics of our gestures that organize the world into meaningful patterns and establish psychic consistency.[2] Since the earliest days of cinema, the world and the body in particular, indeed began to appear and be experienced as ontologically unpredictable and curiously malleable, and somehow not quite fitting into the categories of reason or corporeal schemata. George Méliès's trick films especially emblematize this change, blurring the categories between the animate and the inanimate or the spontaneous and the automatic while exhibiting the world and our bodies subjected to the pulsating, arbitrary energies that make things appear and disappear without a pre-established logic.

Prefiguring the contemporary audiovisual era, especially in how it prepared the ground for numerous present-day morphing effects, Méliès's aesthetics is imbued with gestures in fantastic, magical transformations, unpredictable metamorphoses, multiplications, and dislocations effected by dissolves, multiple exposures, superimpositions, stop-motion substitution tricks, and other technical features of the film medium. Even though these kinds of tricks were a common subject of cinema in its early stages, Méliès's work can be considered as unique in this respect. Take, for example, Dislocation mystérieuse (An Extraordinary Dislocation, 1901): a clown (played by Méliès himself) sits in a chair,

and suddenly the body begins to decompose, body parts such as arms and legs are seen wandering around in the room on their own. In order to light a pipe, the head suddenly detaches from the shoulders and floats toward a nearby candle. In L'Impressionniste fin de siècle (An Up-to-Date Conjuror, 1899) the conjuror lifts his female assistant in his arms, who then just vanishes into thin air. As the magician jumps down from the table, the animate body suddenly changes back into the female assistant. While these films display agile and highly skillful technical gestures, they also present figures that are displaced, distorted and animated, under the influence of unknown forces. What characterizes these early films is a particular kind of indetermination concerning out-of-control bodies that have lost their definition and also a world that has lost its coordinates.

Here the unknown force that affects our bodies and the world we inhabit is, obviously enough, the technology of cinema itself. As Tom Gunning has pointed out, early cinema in general is first and foremost about experimenting with the powers of the new medium – with "early" here referring to what Gunning and André Gaudreault have termed the "cinema of attractions," most specifically an aspect of film culture during the period 1895-1906. It was not based on the lure of narrative continuity but on the attractions of cinematic showing (sheer movement of the image itself, close-ups, and magical transformations using the stop-motion techniques, among other things).[3] From this viewpoint, Méliès's films seem to be specific experiments of the technology's powers to modulate our perception of movement and sense of self-movement, to blur categorical distinctions between the animate and the inanimate, and to question our very being. For example, when in Les cartes vivantes (The Living Playing Cards, 1904) the human-size Queen playing card turns into a woman of flesh and bone, the moving figure thus evoked reveals the impossibility of making clear-cut distinctions between a living being and the technology. The film displays how the cinema *qua* technology of reproducing and rendering movement is the secret for transforming the animate into the animate. Vachel Lindsay, in 1916, observed that "[i]t is a quality, not a defect, of all photoplays that human beings tend to become dolls and mechanisms, and dolls and mechanisms tend to become human."[4] In this way, as Friedrich Kittler notes, cinematographic tricks are about cinema's powers and abilities to create new modes of sensation and perception, new modes of being.[5]

Obviously, the cultural strata on which these decomposing and disappearing bodies emerge include century-old traditions of popular entertainment in magic theatres, magic lantern shows and phantasmagoria presentations.[6] Before getting into the movie business, Méliès had the exclusive rights to the Théâtre Robert-Houdin and was evidently well versed in these traditions. Accordingly, what the trick films articulate in thematic terms are the illusions and skillful

gestures performed, among other things, in magic theatres by mechanical, optical, and prestidigitation tricks. However, in addition to these connections, one can also point out other, perhaps less explicit, genealogies for Méliès's trick films, ones that relate to the aporia of self-movement that the cinema effectuates in its mechanics. Méliès's films stimulate continuous transformations and thus portray the *automatic* character of the new medium that is capable of instigating movements and events without causes or origins and producing action that lacks agency. What one sees in Méliès – as in, according to Sean Cubitt, early animation films such as Émile Cohl's FANTASMAGORIE (1908)[7] – is how forms and figures melt into vectors of movement that automatically generate and reconstruct themselves, confusing and perpetually reworking in this way the relation between subject and object, the viewer and the world viewed.

If we wish to indicate a forerunner of sorts for these ontological and perceptual mutations in the cinema, a strong candidate would be the Pipe-and-Tabor player automaton constructed by French engineer Jacques Vaucanson in 1738. "[T]his little flute is held by but one hand. In the other the automaton holds a stick with which he beats the Marseilles drum," is how Denis Diderot and Jean le Rond d'Alembert's *Encyclopédie* (1751-72) describes the android. "He gives simple and double beats, different rolls for all the melodies, and accompanies them, keeping time for the same melodies that he plays, with the other hand, on his little flute... The apparatus for this consists in an infinite variety of levers and different springs, put in motion with sufficient accuracy to follow the melody."[8] The automaton is itself a kind of perceptual trick, but it's one that incorporates significant ontological and epistemological changes that characterize technological modernity. When displayed at the Hôtel de Longueville in Paris, the android's gestures were appraised as smooth and skillful, and the main point of admiration was how a machine could acquire the virtuosity of human being.[9] What we are witnessing here is the emergence of a zone of indetermination or indiscernibility between spontaneous and automatic, the living and the machine. The machine automatically generates its own movement and thereby challenges clear-cut divisions between subject and object.

Furthermore, one can see this zone of indetermination as an aspect of the darker sides of Literary Romanticism – for instance E.T.A. Hoffmann's *The Sandman* (1816) and its protagonist Nathaniel's crude misperception of the object of his desire. In Hoffmann's satiric tale, poor Nathaniel is incapable of separating Olympia, an automaton, from a living being due to the sheer beauty of the technological creature. He falls in love with the machine and tries to seduce it (or her) at a party, in spite of the fact that Olympia is far from perfect but rather appears as "deathly-rigid and speechless" and walks "with a curiously measured gait."[10]

In all their ambiguity, Nathaniel's misperception as well as Vaucanson's creatures anticipated what was to become, with the emergence of cinema, the reality of perception and experience at the turn of the twentieth century, emblematized by Méliès's works such as Les cartes vivantes, which embody a confusion between the living and the non-living or the animate and the inanimate. Moreover, in addition to these real or imagined machines, what Méliès's films echo in their compositions are, as Rae Beth Gordon shows, late nineteenth-century scientific perceptions of the body and its pathologies that considered the human body as a certain kind of technological arrangement.[11] Under the eyes of the head of the clinic of nervous disorders at the Salpêtrière in Paris during the period 1862-93, Jean-Martin Charcot, patients are transformed into Golems that are essentially speechless and walk with a curious gait and, in this way, converge with cinematic figures as the movements of living beings merge with the mechanical movement of images. Charcot observes one of his patients closely:

> Notice that I have asked him to walk with an ordinary, only a bit precipitate step, and off he goes, his body bent forwards, legs rigid and stretched out, one glued to the other, so to speak, and braced against the tips of feet. In some manner the feet glide on the floor, and they move through a kind of rapid trepidation... As the subject proceeds, it seems at each moment he is threatened by falling forward. In any case, it is impossible for him to stop by himself. Most often he has to cling to a body nearby. One could say that [he is] an automaton moved by a spring, and that in these rigid, jerky, as if convulsive movements there is nothing that resembles the smoothness of the actions of normal gait.[12]

One should bear in mind when reading this description that dates from March 5, 1889, that chronophotographic experiments had already been carried out at Charcot's clinic and the jerky movements of the patients' nervous bodies had already been dissected and reproduced in the camera's mechanics in order to assist the naked eye in mapping out the symptoms on the surface of the body. It is thus fairly evident that the mode of Charcot's vision here coincides with the cinematic perception of movement based on discontinuous cuts of separate poses.

What the observation from this starting point confirms is that the zone of indetermination and indiscernibility that arises with the moving image encompasses first and foremost the realm of *pathos*, bodily gestures, movements, physiognomy – affects and actions – that are characterized by a certain kind of "formlessness" and even, a "mistrust of the human form" as Hoffman described it.[13] Méliès's films are also about this questioning of how the body discovers a new, automatic and initially jerky rhythm with the cinematographic machine. They configure the zone of indetermination as a process of bodily decomposition that rather directly takes up the same problematic of convulsive and "form-

less" movements as the hysterical body. Regarding their genealogical background that is mapped here, one should nonetheless notice that there is also a crucial difference between late-nineteenth-century moving images and nervous bodies and late-eighteenth-century automata. While Vaucanson's works seem elaborate and smooth as they approach the limits of life, Charcot's and Méliès's bodies become by nature convulsive, nervous, and "abnormal" as they approach the limits of technological automatism. These bodies appear to be in a deep crisis.

This crisis, this formlessness of the body and its movements, points to a lack of conscious control over corporeal (or mechanical) automatisms. A medical report from 1892 explains the manifestation of the body's unknown forces as follows:

> Mr. Magnan reported... a very curious case of a woman who from the age of twelve would momentarily lose the free disposition of her movements while remaining fully conscious however. These are, in the first place, movements analogous to simple reflexes, occurring in a part of a limb or in the whole limb... They encompass the movements of the flexion or extension of the hand to the forearm or the forearm to the arm, of the foot to the leg or the leg to the thigh, or the raising of a shoulder. Upon other occasions, they include more extensive movements such as rubbing one's hands or walking forward. Unaware of a purpose, the patient enters a room, walks through it and then moves back; but as she starts walking, she cannot stop herself and would be seriously troubled if she were to stop. All these useless movements, without purpose, are generated beyond her will; the patient recognizes them but remains incapable of suppressing them…[14]

As this "curious case" shows, an affective and gestural being emerged from the conscious ego in the late nineteenth century. This being manifests itself first and foremost in its involuntary actions, corporeal catastrophes, jerky movements and nervous gestures, ones that, like Méliès's figures, reveal a fundamental disturbance of self-awareness related to kinesthetic experiences. Generally speaking, as we shall see in the following chapters, in psychological and psychiatric discourses of the era, psychosomatic pathologies – especially corporeal and psychic intensities beyond normal consciousness – became understood in terms of several kinds of motor automatisms and self-affecting "others" inside the individual.

At the turn of the twentieth century, these corporeal catastrophes almost became the norm. In moving from scientific perceptions to literary observations, Rainer Maria Rilke's *The Notebooks of Malte Laurids Brigge* (1910) presents the protagonist who, while walking along the Boulevard Saint-Michel in Paris, notes the curious behavior of "a tall, emaciated man" whose body displays an "awful jerking." Interestingly, Brigge pays special attention to several types of

micro-movements that the person seems to have lost control of, which appear as rapid and nervous gestures without form or purpose. Brigge minutely observes these movements as if in a cinematic close-up:

> The collar of his overcoat had stood up, and try as he would to put it down again, fussing now with one hand, now with both at once, he did not succeed. That happens. It didn't bother me. But then I perceived with boundless astonishment that in this person's busy hands there were two movements: one a rapid, secret movement, with which he covertly flipped the one collar up, and the other movement, elaborate, prolonged, as if exaggeratedly spelled out, which was meant to put it down. This observation disconcerted me so much that two minutes passed before I realized that in the man's neck, behind his hunched-up overcoat and the nervous activity of his hands, was the same horrible, bisyllabic hopping which had just left his legs.[15]

To continue the list of examples, gestures also became an issue in the theoretical contemplation of visual figures. The German art historian Aby Warburg began to observe and conceptualize the history of Western visual arts at the same time as the scientific and literary observations of the nervous body were developing. His observations were not expressed in terms of beautiful forms or sublime moments but, in the particular affinity they had with Charcot's perception and theories regarding the symptomatic of what Warburg called *Pathosformeln*, "emotive" or "pathos formulas" related to the history of the psyche.[16] These are, like the figures under constant modulation in Méliès's cinema, composed of pulsating, affective unconscious energies and forces that manifest themselves through our bodies and shape our gestural being.

In all, one can say that a bodily crisis occurred with the emergence of the cinema in the late nineteenth century, a crisis concerning gestures that expressed the bodily rhythms by which we prehend our surroundings and simultaneously apprehend it in our minds. Giorgio Agamben, in his short essay "Notes on Gesture," also links the development of cinema to what he calls "a generalized catastrophe of the sphere of gestures" in the late nineteenth century, mentioning Tourette Syndrome as an emblematic case.[17] The connection that Agamben makes between the moving image and the gesture is significant, because he conceptualizes the rise of corporeal catastrophes as a sign of a deeper transformation in Western modernity. According to Agamben, the gesture, in general terms, exhibits our nature as *medial* beings, that is, beings that are often differentiated from other animals by the capacity to represent the world in meaningful sentences and linguistic categories. The gesture signifies action by which a fact becomes an event, a simple occurrence becomes endowed with sense. In this way the gesture, Agamben argues, creates a sphere in which human beings are allowed their "being-in-a-medium," a "sphere of a pure and endless mediality" that encompasses the process of differentiation between being and

thought, the living environment and its cognitive mapping, a differentiation vital to the psychogenesis of life.[18]

Now, as the bodily crises and Méliès's work in particular evince, something happens to the gesture in cinema and consequently to the being that the gesture supports and differentiates. In this chapter, we shall look at how the cinema emerged as a medium that immanently took hold of our "being-in-a-medium" by continuously rendering the gesture, our bodily, rhythmic being, as malleable in its mechanics. One could say that the gesture in the cinema gets caught in a new system of sensation and reference, in new rhythmic constellations, so that it changes in function and in substance. What is unique about cinema, as Gilles Deleuze has shown, is that it automates movement, including our bodily movements, and it is this automation of movement that gives rise to that new dynamic system. What characterizes the process of automation is that the gesture loses its pre-established models and becomes an object of dynamic *modulation*. In the cinema, Deleuze argues, the gesture becomes "a function of space and time, a continuity constructed at each instant, which now only allowed itself to be decomposed into its prominent immanent elements, instead of being related to prior forms which it was to embody."[19] As Méliès's experiments with the powers of cinema demonstrate, the tricks that decompose and recompose the contours of our bodies and the functions of our limbs make the nerves tremble and jerk without periods of stasis so that bodily rhythms become subjected to continuous formation. The moving image does not simply re-present bodily gestures, poses and movements but, instead, harnesses gestures into its technological positivity by becoming immanent to them in terms of dynamically modulating the body.

Thus the cinema doubles the gesture and the animate body in its own mediality. This was noted by early film theorists such as Élie Faure, who, in the 1920s, compared the cinema to dance in terms of immanently conveying the power of rhythm, observing how the silver screen of moving images merges with the plastic manipulation of bodies and limbs.[20] Jean Epstein, in his early writings, also considers the cinema not in terms of the narrative but as a technology that in its mechanics inscribes corporeal rhythms and frees the cadence of life, thus projecting a new dynamics of bodily movements from locomotion to respiration and mastication, among other things.[21] Even if these theorists did not directly articulate the anthropological implications of the new medium, we can follow their conceptualizations to note how the moving image does not have the gesture as its object but becomes a sort of gesture itself.[22]

In this sense, we can see how nervous gestures with their jerky, saccadic rhythms were actually incorporated on the silver screen, where the body not only decomposes, but is also recomposed in a series of dynamic yet discontinuous cuts. We can hypothesize that the emergence of the unconscious corporeal

automaton or the nervous body is essentially intertwined with the new technologies of inscribing movement that emerged during the second half of the nineteenth century – essentially pointing to how the corporeal automaton appears as a product of these technologies. The emergence of the cinema is part of the generalized mechanization that was presented by modern technological media in conjunction with increased capitalist power. This resulted in a situation in which its functioning became intrinsic to both the physiological and the social and cultural spheres. It is precisely this process that corporeal catastrophes, nervous gestures and "abnormal" movements point to: how the body becomes a moving image in the cinema through the modulation of its functions on the screen.

Detached Heads

What forces are at work in the modulation of the gesture and the transformation of the body in the cinema? While this question will be approached from mutually complementary perspectives in the subsequent chapters, here we will focus on the scientific perception and theorization of the living being, in other words, the plane of reference on which the body is captured during the nineteenth century. It is on this plane that the body begins to lose its boundaries and merge with its technological modulations.

For this purpose, let us have a closer look at Méliès's cinematographic work in which the transformation of corporeality becomes emblematized. A repetitive and recurrent figure in Méliès's work is the image of a detached head. The figure often relates to another important characteristic: the multiplication of the self and the body – bodies that double, triple, quadruple, until they totally fill the screen.[23] In Un homme de têtes (The Four Troublesome Heads, 1898) a magician's three detached heads happily sing as the magician plays the banjo, and the film plays on the initial shock of the violent gesture that rips the head from the shoulders, a gesture which is repeated several times as another head suddenly replaces the previous one. As an unanticipated act of decomposition, this trick clearly rests on an effect of astonishment, visual display and "presentification."[24] Simultaneously, however, it presents a deceptive perception, which allows it to retain a sense of ephemerality and non-centeredness. There is in the film's aesthetics a suspension between immediacy and concealment in the experience of reality, a two-fold disjunction between appearance and reality, which borders on psychosis and can be formulated as follows: the image is present to me as an experience but mostly it eludes my gaze and apprehension; it plays a trick on me. In other words, the self-movement of figures is not the self-

movement of my body, while at the same time, this movement is not completely objective outside of my being. Somehow it lies between inside and outside, subjective and objective, or the fictive and the real. The apparitions seem endogenous but do not have my body and brain as their source.

As such, Méliès's figures combine some important lines of development in the connections of corporeality, visibility and knowledge in modernity. In addition to their explicit background in magic shows and stage illusions, the figures and the malleability of the animate body that they witness can also be seen as philosophical experiments, which echo Friedrich Nietzsche, among others, in their take on the body as being first and foremost composed of intensive quantities that operate on the surface and are prone to uncertain transformations and modulations.[25] In Méliès's work, the depths of flesh are replaced by dynamic and fleeting relations between forces on the surface, and the focus is on convulsive gestures and violent outbursts of energy that divide the figure. These corporeal deformations point in particular to a specific kind of epistemological shift in nineteenth-century life sciences, especially physiology, where the body is no longer approached as something to be cut open and dissected but rather as a visible surface composed of invisible forces. One could say that, as experiments on the new medium's powers, these figures depend on changes that took place in the configurations between technology and scientific perception and the available knowledge of the living being in the second half of the nineteenth century.

The shift in physiology that Méliès's figures recapitulate can be characterized as a general tendency towards the *experimentalization of life*. First of all, this shift is based on the view that movement is the most immediate expression of natural life and that the living organism is essentially dynamic by nature.[26] Life is identified with motion and process, while the living organism emerges as something composed of functions and energies rather than as a static structure. Foucault points out that a synthetic concept of life is substituted for the classical taxonomic notion: living beings are not divided into distinct classes according to any general natural order, however, a common notion of life does emerge that synthesizes the various manifestations of the living (e.g., genera, individuals, organs, structures) as a kind of connective force or principle.[27] This principle is movement. Secondly, the change in its definition results in the fact that life ceases to be representable in a static tabular space that is observable by the naked eye. The dynamics of the organism – its functions and energies – is not immediately visible but withdraws and conceals itself from "immediate" recognition.[28] Hence, following Claude Bernard's famous argument, the notion of life as movement requires that physiological knowledge does not only consist of observation. Moreover, it must encompass the experimental variation and modification of natural phenomena so that they appear "in such circumstances in

which nature does not present them."[29] It is understandable that in order to conceive what nature only presents indirectly, one can no longer rely exclusively on static forms of texts and figures. Instead, other kinds of epistemic entities are needed to distribute essential knowledge about life phenomena, ones that would be as dynamic as their subject, the living organism. These are the entities that experimentalization will provide.

In the nineteenth century, a considerable institutional and epistemological development took place in physiology, which was transformed from a marginal discipline with no formal institutional identity into a distinct natural science. This change generated, when the experimental method borrowed from physics and chemistry was conjoined with a mobilization of scientific instruments in producing knowledge about life phenomena.[30] The particular role of instrumentation was significant in this development. Various graphic self-recording machines presented visualizations of hitherto unobservable phenomena, whereas different kinds of apparatuses were used to simulate the functioning of a given organism. These machines made it possible to track life phenomena down into experimentally quantifiable and verifiable "units." Modern physiology could even be considered the "queen of natural sciences"[31] after the machines transformed it into a quantitative and experimental science instead of a descriptive, vivisectional and anatomically oriented approach.

The physiological laboratory, viewed as a special kind of technological formation, crystallizes these lines of development. Experimental studies on vision with so-called philosophical toys – most notably, Joseph Plateau's phenakistiscope, Simon Ritter von Stampfer's stroboscope, and William G. Horner's zoetrope, all dating from the 1830s – draw attention to the subjectivity and irrevocable temporality of human perception, while simultaneously opening up the quantification of perception in terms of intensity and duration of retinal stimulation.[32] On the other hand, the functions of automatic inscription machines – so-called non-invasive techniques such as Carl Ludwig's kymograph (1846), Hermann von Helmholtz's myograph from 1850, and Karl Vierordt's sphygmograph (1855) – are two-fold as well: they produce data on the life functions of the object analyzed and, simultaneously, guarantee that the analyzing subject will have the (ideal) possibility of receiving accurate knowledge with regard to phenomena that withdraw from direct observation. What the machines incorporate in this instance is a crucial experience in modernity that "natural" sensation and perception remain unable to produce accurate knowledge of the world. As Jonathan Crary points out, the importance of modern physiology is to show that the subject of knowledge is conditioned by the anatomical and physiological functioning of the body. No longer complying with the timeless order of classical representation, knowledge becomes lodged within the instability and temporality of corporeal existence.[33] Epistemologically, a disjunction between

perception and reality emerges, a disjunction emblematized in Méliès's malleable and fleeting figures that defy immediate comprehension.

Hermann von Helmholtz, an influential figure in the development of physics, physiology and experimental psychology in the nineteenth century, provides a primary example of the general "crisis" of perception and representation, with the crisis being a question of reference. Helmholtz's epistemological and ontological thinking is an odd mixture of semiotics and physics, which both testify to the degradation of the possibility of any direct experience with the world.[34] In his "empiricist" theory of perception Helmholtz argues that psychological perception – the processing and unifying of the data gathered by different senses – is not an organic process alone but requires a complex task of learning and interpretation. This view is supported by two "sub-theories." First, his sign theory as inspired by Johannes Müller's doctrine of "specific nerve energies," deals with the problem of how identical physical signals produce different qualities of sensory experience. Helmholtz arrives at the conception that there is an encoding that takes place between the physical signals and the physiological "signs" when physical stimuli make the transition from physical energy to electrochemical energy upon entering the nervous system. These signs do not resemble physical objects because the quality of a sensation depends principally on the sensory system and the brain, which process the stimulus. A single type of stimulus is capable of producing different kinds of sensations. Thus, Helmholtz rejects the possibility of knowledge by mere observation because sensations alone cannot present objective representations. The representational status of the sign is not dependent on any kind of similarity between the sign and what it is a sign of. However, signs should not be dismissed as merely subjective. Instead, Helmholtz contends, they enter into a legal-like relationship with the physical stimuli, allowing them to be seen as something that corresponds to the order of the natural world. This view is supported by a second sub-theory, the theory of unconscious inferences, which attempts to re-establish the connection between the human sensory system and the object world by discovering the laws that guide their interaction. The theory attempts to demonstrate that perception requires rules that guide the interpretation of sensory patterns, and that they are mostly applied unconsciously by the mind.

It is also this general lack of reference due to a distrust in human perception that permeates Méliès's aesthetics. The figure of the detached heads in particular focuses on the problem of representation and attempts to negotiate new kinds of perceptual and expressive formations. For example, the effect of multiple layering produced by several exposures of a film strip in Le mélomane (The Melomaniac, 1903), where seven heads hanging on power lines take the role of living, singing notes on a staff, affirms the enfolding of the eyes onto the web of their own corporeality (fig. 1). The eye becomes an organ of prehension and not

one of objectification; it simulates and modulates instead of reflecting or gazing at the world. This is due to a particular arrangement of space that the film produces, which Gunning defines as "a surface bearing the imprint of several images that create an ambiguous area of often contradictory orientations."[35] Several exposures of a film strip produce a surface in which the horizon, the distance and even the gravity are all susceptible to disappearance, and moving objects may occupy any point in space whatsoever with no hierarchy between the diagonal, vertical or horizontal axes of action. Stop-motion and multiple exposure techniques transform the space into a matrix of conflicting processes, where living heads turn into singing notes or power lines into a musical staff. This space, as Gunning notes, is metaphorical, but in the sense of a self-contained and arbitrary metaphor of the process of the trick itself.[36] The film is like the human body for Helmholtz, in that it embodies and employs "signs" or metaphors that, instead of having any direct relation to what we might picture as physical reality, encode, process and transform the world according to the self-enclosed spectacle of the film's "specific nerve energies." The film, in other words, complicates clear-cut demarcations between what pertains to the endogenous apparitions and what to the external reality. It gives rise to a special kind of visuality, one that embeds perception within multiple simultaneous layers of images and makes it bear, not on the outer world, but on its own texture as the effect of its own fabrication.

In this way, Le mélomane actually performs an experiment on the reproducibility and transformability of the eye and corporeality in the cinematographic machine, which is based on the blurring of figure and ground. With the multiple-exposure technique, the ground becomes a flat surface for the inscription of serial images, and it is as if the ground eventually melts away in this process of enfolding several image "layers" into a complex and even contradictory surface: one cannot distinguish between the image and its outside, where one image ends and another one begins. Consequently, the possibility of a Cartesian beholder apprehending the entire world instantaneously is erased. Our eyes travel uncertainly through separate areas and levels, mapping image fields by making elementary and partial connections between diverse overlapping localities.[37] Thus, what is also crucial is that the distance between the image and the observer tends to obliterate, and the image becomes a simulation of the observer's body so that the moving ground, which is my body, becomes the figure, and vice versa. The eye and the nervous system gradually enter into a zone of indistinction with the technologically produced image.

Méliès's experiment captures an important aspect of the role of instrumentation in nineteenth-century scientific practices that concerns how the technologically produced image and the observer, or the body and its technological counterpart, get confused by new techniques of visualization and inscription. To

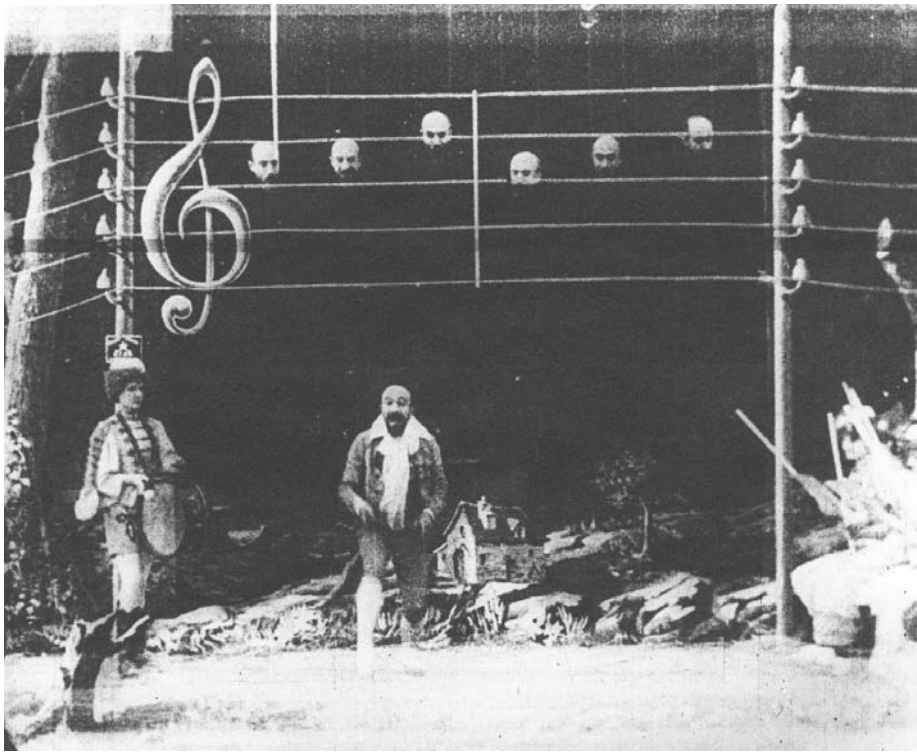

Figure 1 Still from Le mélomane, *by Georges Méliès (The Melomaniac, 1903)*

continue to unravel the epistemological stakes at play in this context, according to Helmholtz, the gap between the senses and nature is traversed neither through any divine power nor an act of introspection or interpretation but through experimentation. Both the sign-theory and the theory of unconscious inferences rely on an empirical foundation and to a considerable extent on experimental tests. In order to acquire essential knowledge of natural phenomena it is not sufficient to merely observe passively, one must also actively interact with objects to deliberately alter their conditions. However, the human sensory apparatus is limited at the outset in this respect. That is because Helmholtz considers perception as pragmatic by nature: much of the sensory information is ignored as humans unconsciously process incoming stimuli in order to pursue successful actions as their primary objective. Or, as Timothy Lenoir points out, for Helmholtz "[o]ur visual perceptions have real import, but rather than being properties abstracted or copied from things, the contents of visual perceptions are constructed by us through the practical actions we undertake in successfully orchestrating our interactions with the world."[38] It is this pragmatic and limited

nature of perception that the experimenter has to surpass in order to reach the laws of phenomena. Consequently, instrumentation enters at the fulcrum of the experimental approach. Regarding perception, for example, the law-like phenomena that link physiological signs to physical signals should be approached via the instruments, which both analyze and synthesize the functioning of, say, an acoustic phenomenon. Analytical instruments, as Patrick McDonald points out, operate by producing analogues of their physical counterparts. Synthesis, however, is required to reconstruct the phenomenon analyzed in order to test the hypothesis of its functioning. This is achieved by simulating the effects of the phenomenon, which is how a lot of epistemic importance is attributed to simulation techniques.[39] Essentially, the synthesis that simulation makes possible demonstrates that there is, in principle, no real difference between the model and the original, i.e., the technological and the living.

In this light, the word "simulation" should not be understood as a general collapse into a world of subjective illusions but rather as a new kind of ontological and epistemological formation. "Simulation" in its etymology refers to a mere shadow of the world of real living beings and, at the same time, a false copy or an artifice with the negative connotation of fakery. Nonetheless, there is also another meaning of the word, which is more applicable to the changing configurations of vision and knowledge in modernity. Since the Second World War, simulation has come to designate an epistemological and cognitive practice in which one attempts to apprehend the properties of a given thing, phenomenon or function by constructing an experimental model of it.[40] Experimental situations simulate their subjects by creating an abstract model of the subject's substance and function that aspires to reproduce the subject and, eventually, to collapse distinctions between the original and the simulation.

In epistemological terms, then, the blurring and potential collapse of distinctions between what is termed the "original" and its "copy" is a delicate question. As noted, it should not simply be approached in terms of essences and the logic of representation, in which case, one would argue for a gradual obliteration of traditional notions of true and false, for example. Simulation does not follow the logic of representation but necessitates a "logic" of surfaces, according to which it is not a question of depths – models and their copies, essences and appearances – but of its functioning and its effects, of the creation of relations and new modes of being.[41] In light of this kind of affirmative, "processual" and non-representational understanding of simulation, there is no transcendental point of anchorage outside of the simulation practices.[42] Hierarchical relations between models and their (good or bad) copies are obliterated. Rather, models and their copies – like the potentially infinitely multiplying heads detached from their traditional positions in Méliès's films – become effects of simulation and simulation itself acquires the role of a productive force.

What the plane of reference of nineteenth-century physiology rests on is simulation in this processual sense, according to which two or more terms are substitutable despite their disjunction. In fact modern simulation practices, according to Jessica Riskin, had already emerged by the mid-eighteenth century.[43] Their emergence was inaugurated by a materialistic and mechanistic understanding of life and thought, one that undermines the exemption of consciousness from mechanical explanation that Cartesian dualism would justify, and was characterized by "a growing confidence, derived from ever-improving instruments, that experimentation could reveal nature's actual design."[44] Within the materialistic configuration of the body and the mind, a new kind of epistemological entity is introduced, namely, "the practice of using machinery to approximate nature, then experimenting on the model and drawing conclusions about its natural prototype – in short, 'simulation' as we now mean it…."[45] During the second half of the eighteenth century, simulations of life functions were provided by mechanical automata, or "self-moving machines." It is perhaps not purely coincidental that Méliès had a stuffed peacock, which ate grains of hemp seed, in his collection of "magical" objects.[46] The apparatus resembled the celebrated mechanical duck, designed in 1738 by Vaucanson to swallow corn and grain as well as defecate a proper outcome. Riskin points out that, despite their obvious spectacular function, Vaucanson's automata were first and foremost the results of philosophical and scientific experiments that complicated the demarcation between the living and the machine. Vaucanson's automata manifested a new epistemological formation relying on simulation, not in terms of technological advance but in terms of perception and knowledge. That is because their goal was to imitate the stuff of life both internally and externally. Earlier automata from the seventeenth century, for example, were designed only to mimic the behavior of living beings externally and were valuable mostly as amusements, while late eighteenth-century automata presented a given organism with its functions and its substance along with its appearance. They managed to anticipate present-day research on artificial life, according to Riskin, because they were "attempts to discern which aspects of living creatures could be reproduced in machinery... and what such reproductions might reveal about their natural subjects."[47]

Initiating a zone of indistinction where separate terms can be conflated, Vaucanson's duck performed an operation that the cinema and pre-cinematographic technologies took up during the latter half of the nineteenth century: the conflation of the moving, living body with its technological simulations both epistemologically and in practice. It is from this viewpoint that we should look at Méliès's experiments, not in terms of fakery designed simply to trick the eye and carry us to the realm of dreams or illusions but, rather, as attempts to figure out what the technology of cinema can do to the body and which aspects

of the living being can be reproduced and also transformed in its mechanics. Méliès's films show how cinema took hold of and shaped the functions of the animate body. In films like Un homme de têtes or Le mélomane the focus is on the conflation of the experience of movement and the image automated by the cinematographic machine – especially the ways in which cinematic tricks enable events on the silver screen to become immanent with our corporeal and perceptual reality. The films question how cinema managed to modulate a different reality from the one experienced within the limits of the physical body alone.

Non-Human Observers

As the case of Helmholtz reveals, when the order of reference between perception and its object is lost, analysis and simulation techniques are required to re-establish the basis for possible knowledge. Instrumental "mediation" replaces direct acquisition in understanding the world. This means that if experience was previously guaranteed by a kind of atemporal frame of reference, in modernity the grounding of epistemology appears problematic and requires technical safeguards.

It is this experimental situation that provides the epistemological background for the emergence of cinema, which is made tangible when we look at the scientific horizon within which the first steps toward cinema technology were taken. Helmholtz had a strong influence on the work of the French physiologist Étienne-Jules Marey who is often considered to be a major contributor, albeit in a somewhat ambiguous manner, to the necessary technical innovations that led to the development of the cinematographic camera and projector.[48] A decade before his efforts in this field, Marey had begun constructing artificial insects and birds to study the "mechanical conditions" of flight as well as artificial organs in order to research the circulation of the blood, among other things. These automata continue Vaucanson's "program" of attempting to simulate life functions experimentally.[49] But, despite the short period of time allocated to automata, Marey's main concentration was on improving, designing and constructing diverse self-recording machines – graphic and chronophotographic apparatuses – that, in the beginning at least, aspired to inscribe and analyze instead of strictly presenting the appearance of movement. However, in this way, the difference between inscription and (re)production of movement notwithstanding, it can be argued that the conception of cinema emerged from the scientific practices that were striving for the experimentalization and simulation of life.

Marey understood that the essence of living beings consists simply of movement. This means that by inscribing and reproducing movement one attains the

very stuff of life itself. As an eager proponent of the experimental approach in physiology, Marey argued that vivisection "cannot be applied to the regular play of normal life," and he considered the living being – or the "animal machine," as he termed it – a dynamic field of energies.[50] Instruments, on the other hand, are the "indispensable intermediaries between mind and matter."[51] The physiologist believes that while the human senses and natural languages are incapable of producing essential knowledge of natural phenomena, automatic inscription machines can. The graphical method provides the scientist, the "engineer of life" as one of Marey's students called him, with machines that can go beyond the obstacles that the senses and languages represent in the comprehension of natural phenomena, especially in their dynamic aspects such as "movements, electric currents, variations of gravity and temperature." The self-recording machine will "penetrate the intimate function of organisms." That is because it relentlessly and randomly (without understanding or representation) records the real instant by instant: t1, t2, t3... tn. Interval by interval, the machine verifies the accidental and contingent duration of the organism itself, whereby the curve of a myograph is somewhat parallel to the "excrement" of Vaucanson's duck: "nature speaks for itself."

As for the deficiencies of natural languages, Marey argues, on the one hand, that the graph produced by the instrument "translates" the language of natural phenomena in a clear and concise manner, and thus provides a kind of universal language that is superior to other modes of expression.[52] On the other hand, regarding the senses, the machine shall replace the observer by acquiring the kind of phenomena that are unattainable by direct observation. Marey made considerable improvements on the technical configurations of numerous earlier recording instruments such as the myograph that inscribes muscular activity, the sphygmograph, or pulse writer, which traces the heartbeat, and the chronograph that penetrates the infinitely small temporal intervals of reflex action. In relation to the maximizing of the physical capacity of, say, a worker or a soldier, a lot of effort is also focused on the study of human or animal locomotion, voluntary movements such as the gait, running, and the trot. Importantly, the data produced by automatic inscription machines, and later by chronophotographic apparatuses, is further synthesized with the phenakistiscope and viewed in slow motion, for example. That is because the synthesis of different phases of movement provided by the apparatus (and earlier by mechanical automata[53]) demonstrates the analytical precision of Marey's approach. The engineer appraises the phenakistiscope: "by turning it less quickly, we cause it to represent the movements much more slowly, so that the eye can ascertain with the greatest facility these actions, the succession of which cannot be apprehended in ordinary walking."[54] Generally speaking, as we have seen, the role of this synthesis in experimental research is crucial to nineteenth-century science. Mechan-

ical simulations, Peter Harman argues, are not only conceived in terms of representations of reality, but they are seen as demonstrating the assumption that phenomena could in principle be presented by mechanics. These simulations, in other words, render phenomena intelligible.[55] For Marey, a phenomenon could not be fully comprehended without the use of simulation.[56]

It is fundamentally the synthesis of movement, a process of simulation that, coupled with data originating from analysis techniques, guarantees the referential framework which experimental perception and knowledge are based on. Thus, the question concerns what kind of perception informs Marey's research in this respect. It should be emphasized that the mode of vision Marey is referring to is not that of the phenomenological observer but, rather, an automatic one. It is the automaton that "perceives" and even "knows."[57] Technologies of automatic inscription – "patient and exact observers, provided with more numerous and perfect senses than our own"[58] – as well as those of automatic synthesis comprehend the areas of life that are usually ignored by human perception and consciousness. Kittler in unraveling the aporias of technological modernity, aptly observes that "What people can no longer see or hear … calls for technical media."[59] It is crucial to note, regarding this epistemological problem, that self-recording and simulation machines embody a degree zero of perception, a kind of "zeroness" of perception, which takes place *prior to* the emergence of the human observer. Consequently, these machines can be understood as a type of non-human observer that generates the very possibility of visual knowledge upon which the experimental framework is based. As producers of non-sensed sensibilia, self-recording machines operate as partial observers that embody the affections and perceptions without which scientific functions and propositions would remain unintelligible. They create the sensibilia that scientific functions suppose.[60]

These experimental simulations anticipate the cinematic perceptual system insofar as the latter is at least potentially independent of the intervention of a human observer or interpreter. As Méliès's experiments show and what the film theorists of the 1920s confirm, is that cinema simulates a different nature than the human eye can perceive. According to Epstein, the film camera lens serves as "an eye endowed with non-human analytic properties. It is an eye without prejudices, without morals, and free of all influences..."[61] This eye more closely approximates "the optical facets of a giant insect" than the retina; it operates beyond the sensible – a point that has been reiterated by several contemporary theorists such as Paul Virilio and Gilles Deleuze.[62] Similarly, Méliès's legendary account of the "discovery" of stop-motion cinematography as the basis for the substitution trick already implies this non-human nature of cinematic perception, suggesting how the cinema detaches itself from the limits of human sense-

making by opening up a sphere of fleeting impressions and playing on a series of accidental and chance encounters. Méliès narrates:

> One day, when I was photographing as usual at the Place de l'Opéra, the camera I used at the beginning (a primitive one in which the film tore or frequently caught and refused to advance) jammed and produced an unexpected result; a minute was needed to disengage the film and to make the camera work again. During this minute, the passerby, a horse trolley, and the vehicles had, of course, changed positions. In projecting the strip, rejoined at the point of break, I suddenly saw a Madeleine-Bastille trolley change into a hearse and men changed into women.[63]

Here the cinematic cutting up of the real and its synthesis concern dynamic becomings rather than the appearance of static, self-identical forms. However, what is at issue in Méliès's account is editing, which, of course, separates filmic expression from continuous curves traced by self-recording machines. The discontinuity in filming that this story brings up, is, nonetheless, related to the disjunction of representation and reality manifest in the self-recording machine. Both cinema and self-recording machines automatically generate sensibilia non-sensed by the phenomenological observer and produce technological modulations of movement that remain out of the reach of human perception and consciousness.[64]

Not surprisingly, analysis and synthesis technologies were meant to generally replace even the human observer, to eliminate any subjective intervention in the process of experimentation and data gathering. Lorraine Daston and Peter Galison point out that the late-nineteenth-century epistemological framework is characterized by the scientist-subject's striving for self-discipline in which "[i]nterpretation, selectivity, artistry, and judgment itself" are considered subjective temptations that require mechanical or procedural safeguards.[65] Daston and Galison call this general tendency toward the elimination of subjectivity "mechanical objectivity" in which automation is equated with authenticity, even in a moral sense.[66] The self-recording machine was meant to replace the intervening, fallible and drained observer, and to introduce "freedom from will" rather than freedom of the will.

Self-recording machines, the anti-hermeneutic systems that prefigured cinema, ultimately established their own domain of reality. In Marey's view, "These machines are not only destined to replace the observer, in which case they perform their role with overwhelming supremacy, but they also have their own domain where they become irreplaceable. When the eye ceases to see, these machines become the new senses of astounding precision."[67] The machines function as irreplaceable (moral) yardsticks for the blind, the deaf, and even the psychotic. However, as Marey implies, no medium ever mirrors what it "sees" or "hears." It modulates and mutates the given object. More precisely,

what Marey implies is that the pre-cinematographic simulation technologies and the cinema generate an "ungrounding" and transformation of visual experience in terms of both sensation and knowledge, a transformation within which sensation and knowledge are transported into a new domain.

During the latter half of the nineteenth century, new imaging and iconographic technologies (X-Ray photography, chronophotography, cinematography) and new technologies of speed (the bicycle, car, and train) generally opened up a new, decentered configuration of "seeing" and visibility – one that, as Monique Sicard shows, strived to exceed the field of the optical itself.[68] In this respect, it is important to point out the difference between long-exposure photography and the new techniques of inscription and simulation. Of course, the naturalistic qualities outlined above with regard to the history of the technology of moving images have also been attributed to photographic presentation, "the pencil of nature," which developed along the same historical axis as self-recording machines and philosophical toys, and often also served as the model for understanding the cinematographic image.[69] However, it seems that long-exposure photography belongs to a register of sensation and perception that is different from those of the cinema and pre-cinematographic technologies. Following Deleuze, we can approach the problem by dividing it into three kinds of images.[70] First, "eternal poses" are images that have the status of a rigid mould, which expresses atomistic instants that function through analogy or resemblance. This is the category to which long-exposure photography belongs. Secondly, "immobile sections" are like snapshots that provide "any-instants-whatever" of the world's movement and are stuck between the immobility of the mould and the dynamics of modulation. They are potentially attached to another image, and thus anticipate the kinesthetic and temporal aspects of the third category, that of "mobile sections" which offer a temporal perspective of the world and primarily refer to the cinema – shot and editing. But the self-recording machines that immediately preceded cinema also fall into this category. A salient point is that mobile sections are temporal perspectives that present flexible modulations of the given "object" that constantly alter the identity between the image and what it is an image of. Thus, in defining the difference between (long-exposure) photography and the moving image, the distinction between the mould and modulation becomes central. Deleuze wrote that, "the mould organizes the internal forces of the thing in such a way that they reach a state of equilibrium at a certain instant (immobile section). However, modulation does not stop when equilibrium is reached, and constantly modifies the mould, constitutes a variable, continuous, temporal mould."[71] According to Deleuze, since the photographic image is immobile itself, it is the mind that has to "add" movement to the image. But automatic inscription machines from myographs to the cinematograph produce movement by themselves, independent

of an outside observer – just like Méliès's tricks in which figures are put under constant technological transformation by alien forces.

As for the modulation of life phenomena in the experimental laboratory, the crucial point is that what is technologically produced becomes reality. It is factually "brought into existence" through tests, and is thereafter incorporated into the world we perceive and know.[72] Self-recording machines modulate "matters of fact" by generating and not simply by re-presenting them. Devoid of representation, the machines detach themselves from human understanding. They are not confined to the intuiting of things within the limits of the human senses and consciousness. Kittler stresses this point in his analysis of modern technological media, which is similar to Deleuze's thinking with respect to how he understands their epistemological implications. What is essential to the processes of modernization, according to Kittler, is the epistemological shift from psychological translation to material transposition, which is inaugurated by technologies of automation and mechanical reproduction.[73] Whereas psychological translation designates an act of interpretation in which there is a bridge of access and understanding between the encoding agent (e.g., nature) and the decoding interpreter (the subject), material transposition expresses the collapse of this providential link. In the latter case, in keeping with Helmholtz's and Marey's automatic recording machines, no consciousness has the power to illuminate the object being studied. That is because when they are conceived, machines relentlessly record what they sense, both things that make sense but especially the nonsense.

Kittler notes that in an automatic writing-down system "transposition necessarily takes the place of translation. Whereas translation excludes all particularities in favor of a general equivalent, the transposition of media is accomplished serially."[74] Translation is based on representation, the imposition of an *a priori* form upon the sensible, which is the epistemological position Immanuel Kant formulated in his critical philosophy. Transposition, however, operates through the immanent modulation of the real, penetrating into the world's rhythm moment by moment without recourse to any general model. The functions of self-recording machines do not mirror nature's imagined poesy which, to quote Kant, "figuratively speaks to us in its beautiful forms."[75] Rather, they are autopoetic. They expose and impose their own mediality. The mechanized gestures of a self-recording machine open up, in Agamben's words, a general and immanent "being-in-a-medium."[76] Or, to paraphrase Kittler's insight, it is as if the sense data "were originating in the brain itself" rather than emanating from any particular mediating technique.[77] This means that the machines produce the world; they bring things into existence. They do not simply mediate between the subject and the object, or the cause and the effect. Instead, causes and effects in modern simulation practices are immanent to each other, which

means that the function of a self-recording machine is not external to what it produces but the machine is immanent to what actually occurs. In Deleuze's definition, "A cause is immanent... when its effect is 'immanate' in the cause, rather than emanating from it."[78] Not "mere" mediations but "immanations," the modulations that the self-recording machine forges should not be viewed as somehow ontologically lesser beings than their objects.

This also applies to the technology of the cinematograph. Méliès's films exemplify how, with the use of stop-motion and multiple exposure, cinematic visuality becomes an inscription surface for events that lack a cause such as sudden apparitions, dislocations, and metamorphoses, in other words, immanent occurrences of the cinematographic machine. In this sense, the figures of decomposing bodies and detached heads, ones that point to serial modulations as well as asymmetric relations between perception and reality postulated by the epistemology of simulation, take up cinema's genealogy as a technology for capturing the living and probe the medium's capacities to automate processes beyond human perception. That is where their ontological uncertainty and contingency, rooted in the confusion between external images and endogenous apparitions, derive from.

Penetrating the Nervous Apparatus

We have now tracked the genealogy of the moving image down to nineteenth-century dispositifs of recording rather than to optical models. The cinema, understood as a technology that translates image, perception, consciousness and matter into movement, emerges from the nineteenth-century experimental physiological laboratory. Focusing on Méliès, we have seen that the so-called fantastic world of the trick film, representative of cinema in general, is just as "scientific" as the reality that self-recording machines in the physiological laboratory generate. By conflating cause and effect, these machines, like their cinematographic progeny, bring forth continuous, immanent modulations of the real and confuse the sense of demarcation between the image and the world. Consequently, our world becomes what the machines create. This is exactly the function of Méliès's tricks, which transform the figure on a playing card into a living human being, or facilitate the endless multiplication of a body. They show how the moving image is the effect of itself. The moving image is its own reality and also determines ours.

One thing about these tricks is that they are obsessed with the human body, as we have already pointed out regarding how the moving image emerged as a corporeal crisis. This obsession suggests how the cinema since its inception gen-

erated an assault on corporeality. Following this cue, one can consider the detached heads and nervous gestures in Méliès's work as singular manifestations of the ways the body in cinema gets caught in a process of continuous modulation of its functions and substance, a process which dissolves the body's contours and the sense of demarcation referred to above. In this regard, Méliès's experiments also echo the laboratory practices of experimental physiology.

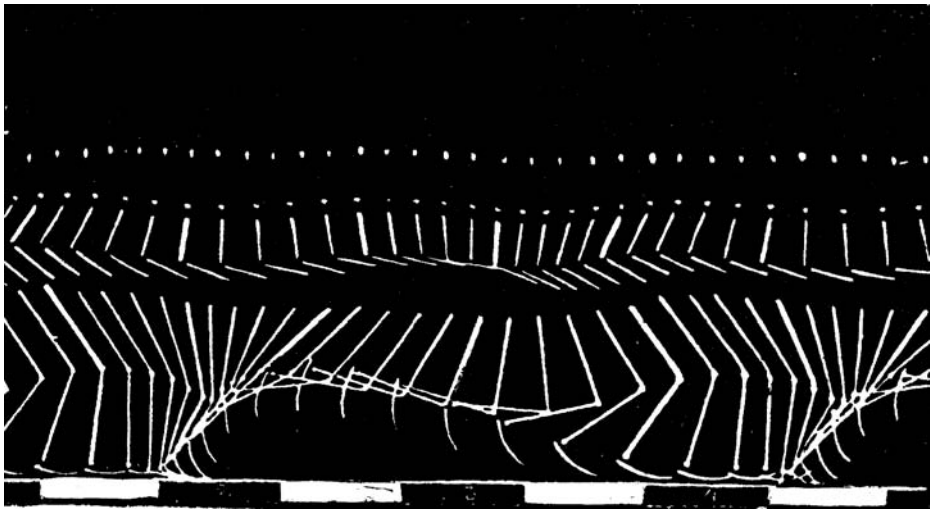

Figure 2 Étienne-Jules Marey, chronophotograph of a running body, from Movement, *ca. 1890*

In Marey's Station Physiologique, located in Bois de Boulogne, Paris, where much of his research was conducted, it was specifically the sensorimotor system that self-recording machines would immanently grasp by transposing it into their own referential framework: bodies running, jumping, breathing and reacting connected to machines which tracked their dynamics down. In this configuration, the role of self-recording machines is to reduce physiological phenomena to the functional relationship between variable quantities, that is, the frequency and amplitude of the (chronophoto)graphic recording. Following the epistemology of modulation, there is in principle no demarcation between the recording machine and the body. The signs produced by the automaton appear as immanent with the signs that circulate within the human motor and sensory systems. The body as referent is thus transposed into serial points that constitute the graph. The senses and body become apprehended through their abstracted modulations that consist of the self-recording machine and the "data" the machine produces (fig. 2).

Thus, the assault on the body concerns its transposability into the machine and as a machine. It is worth pointing out that Marey mentions physiologists Wilhelm and Eduard Weber as his precursors, for the Weber brothers were among the first to use machines and measuring instruments as a method for simulating life functions.[79] Wilhelm Braune and Otto Fischer, who in the 1890s continued the research done by the Weber brothers and Marey, credit the Webers for demonstrating "that the movements of man, particularly in walking and running, are amenable to mechanical processing."[80] This was the precursor of cinema. In analyzing the Weber brothers' work, Kittler finds the "origins" of the cinematographic medium in the scientific history of moving, especially in the human body experiments and related work. Kittler points out the Weber brothers' book, *Mechanics of the Human Walking Apparatus*, first published in 1836, as a landmark in that it presented one of the first attempts to scientifically visualize the human gait and reconstruct the corporeal apparatus by measuring and testing its motion. The goal of Webers' anatomical-physiological work was to provide a mathematical theory of walking and running. Legs were considered a differential system, a sort of pendulum, and the total motion of the human gait was accomplished as a summation of partial differential equations according to the three dimensions of space and the one of time. The brothers mathematically deduced the various positions of the knees, hips, leg muscles and joints, and drew a series of pictures representing a skeleton in each of the regular individual phases of walking, running and jumping. The series would then be reanimated with the stroboscope, the "wheel of life," for further verification. Kittler argues that, in Webers' experiments, movements were calculated in virtual but visible spaces for the first time in the history of visual simulations.[81]

The mechanical processing and calculation of the living being continued with the development of self-recording machines. However, concerning physiological phenomena, one of the most important variables in graphic and chronophotographic recordings is time rather than the parameters of Euclidean space. Temporality, which Kant, among others, considered impossible to empirically investigate, became the subject of experimentation. Helmholtz's "lost time," *temps perdu*, became the most enigmatic and challenging aspect of the study of animal machines.[82] Lost time was "discovered" during Helmholtz's investigations of the speed of the transference of a shock along the nerve to the point of muscular contraction. Lost time indicates the temporal interval between the muscle's reception of a shock and its contraction – a moment when nothing seems to happen and which the human nervous system does not seem to detect. More generally, what has to be traced is what Marey considers the "infinitely divisible" space-time continuum, which supports the moving body, "*les infiniment petits du temps*" over which the body changes position. The diagram of the self-recording machine makes minute changes in time visible and comprehensi-

ble, while penetrating into the shortest intervals of the nervous system and modulating these in a manner that allowed the system's function to be calculated.[83] As such, the principle of self-recording machines is, in fact, similar to the one guiding Vaucanson's duck, which was focused on the verification of the interval between eating and defecating, in other words, the temporality of a physiological process.

Marey saw that the graphical method confronted some fundamental difficulties in tracing this temporality. The first one concerned the role of the mediating apparatus, namely, the resistant properties of the conducting material. Searching for the most immaterial link between the body and the instrument, Marey moved from India-rubber tubing to air pressure, among other things. Eventually, photography that relied on light came to be considered the ideal "mediator."[84] Inspired by Eadweard James Muybridge's experiments with instantaneous and serial photography under the providence of the Governor, or robber baron, Leland Stanford, Marey entered the emerging field of chronophotography. He not only adopted Muybridge's method of sequential photography, but also created a systematic multiple exposure on a single photographic plate to register successive spatial positions of an animated body, that is, a continuous passage of movement as in graphic recordings. This allowed the photographic method to overcome the second difficulty involving experimental graphs, that of harmonizing and making the categories of space and time compatible in a single presentation. In Marey's fixed-plate chronophotographs, one frame included the positions of the subject filmed, separated by time intervals of constant and known duration. The aim was to produce the largest possible number of images on one plate and, as with sequential chronophotography, to penetrate the smallest interval of time, that of lost time.

However, penetrating time created other difficulties especially in the photographing of the motions of large and/or slow-moving bodies. Since the camera produced too many pictures too quickly, the phases of movement overlapped causing (cognitive) confusion in the overall motion. One solution was a shift toward more abstraction by suppressing the field of visibility for the eye of the camera and by detaching movement itself from the bodies of the performers (see fig. 2).[85] Marey covered the subjects in black cloth and marked their joints with shiny buttons and metal bands in order to transform them into a graphic notation. Only part of the body was visible, with the figure sometimes even merging with the ground (understood as pure movement) to become a kind of graph itself. This is a concrete example of how perception underwent radical changes in modernity. In Marey's case, the analysis and (re)production of the nervous system require the introduction of time as a function into the image, which again produces new kinds of body-machine assemblages. Most importantly, when inscription apparatuses begin to penetrate the nervous system's

temporality, the body begins to lose its thickness and contours. As Marta Braun points out, in order to remove the "imprint of flesh and skin so as to reveal the moving parts of the animate machine – the joints, levers, and fulcrums, the rods, and pistons of the human body – [Marey] concocted a moving skeleton, denuding the body of its flesh and volume."[86]

As a result of Marey's chronophotography experiments, Braun sees that there is a vision that goes beyond sight, a "new reality," which further challenged the tradition of Western pictorial presentation.[87] This new reality is comprised of figures that are susceptible to constant formation in vectors of movement that the chronophotographic machine generates. The mode of vision here can be characterized as "diagrammatic" in the sense that it outlines and automates intensities and tendencies of movement and traces the body as a dynamic surface of forces rather than as a substantial form.[88] Specific to non-human automatic observers, this vision aims at spatialization and calculation and substitutes direct contact and immanent production – the conflation of cause and effect – for distance and substance. It traces, scans, reorganizes and abstracts rather than resembles or represents, and thus offers a specific kind of cartography of the body.

Méliès's films take up the kind of vision at stake in Marey's experiments quite directly. It is a vision that should be considered a constitutive potentiality of the cinematic medium in general. As in Marey's multiple exposure chronophotography, in Méliès's multiple exposure tricks bodies emerge first and foremost as sites of experimentation and are seen as forces and processes that are subject to technological modulation. The trick in L'Impressionniste fin de siècle that shows the magician changing into the female assistant mid-leap dissolves the identity of forms into vectors of movement that it simultaneously traces. The animate body is scanned as a kind of graph of processual variation and automated as a tendency of movement. Here, as in Un homme de têtes and Le mélomane, diagrammatic vision is about endogenous generation of forms and figures, experimenting on perception and blurring clear-cut distinctions between the moving image and the viewer in a world where causes cannot be separated from their effects.

The new reality that the body confronts in cinema is that it loses its substance and becomes malleable, which allows it to adapt to the modulation in the moving image. This is the reality that Marey pioneered with his chronophotographs and animations – film tricks, or trick films, that resembled Méliès films on decomposed bodies and detached heads. Both consider the body as something devoid of thickness and flesh, and as fundamentally quantifiable and malleable. Representative of the moving image in the cinema in general, the trick film should thus be considered something that captures those modern transposition practices in which the body merges with technological media.

To sum up the argument, cinema commenced the moment that animate nature was subsumed under experimental explanation, which traces and aspires to dividing, quantifying and controlling – analyzing and synthesizing – the time of the nervous system. Cinema does not present immobile engravings or models of static anatomical structures, but effects immanent modulations of the dynamics of the animate body. In this light, the emergence of nervous gestures points to the impossibility of differentiation between technology and reality that self-recording machines and the cinema initiated. Automating spontaneous movement in its mechanics, the cinema indeed appears to downplay the capacity to demarcate between the living environment and its cognitive mapping, a capacity that bears on the fundamentals of the psychogenesis of life. The subject of the next chapter will cover how cinema modulates a specific form of life that can be characterized as experimental, one that is brought forth in physiological laboratories and becomes first and foremost embodied in the mechanized, automatic gestures of self-recording machines.

2 Experimental Life: The Biopolitical Context

Test Subject

The cinema emerged as an experiment of the corporeal capacities that obscured the boundaries of our bodies in its mechanics. Georges Méliès's trick films bear witness to a fundamental blurring of the automatic movement of figures on the screen and the spectators' experience of the self-movement and spontaneity of their bodies. Similarly, while complicating the separation between the cinema and its viewer, the moving image and perception, they modulate the thresholds of waking life and awareness. Recent psychological studies demonstrate that kinesthetic bodily dynamics and self-movement form the core of the psychogenesis of conscious life and subjective experience.[1] In this sense, sudden apparitions, detached heads and decomposing bodies incorporate the shifting relations between media technologies, the animate body, and consciousness as well as the unconscious in modernity.

Importantly, in this respect, Gilles Deleuze suggests that the moving image developed in conjunction with an epistemological crisis in psychology concerning how at some point it turned out difficult to maintain the position that attributes the image to consciousness and movements to space. Deleuze explained the problem: "In consciousness there would only be images – these were qualitative and without extension. In space there would only be movements – these were extended and quantitative. But how is it possible to pass from one order to the other?"[2] From this observation, Deleuze also goes on to discuss different kinds of solutions to this problem brought up in the works of both Henri Bergson and Edmund Husserl. Deleuze connects these to the new perceptual dynamics that the moving image activates and argues that it is precisely in the cinema that the image and movement become immanent to one another and where the distinctions between subject and object, intensive and extensive become uncertain. For Deleuze, it is the automation of movement that finally blurs the separations between the two orders.

However, what Deleuze leaves out of his observations is how the problem was treated in the context of late-nineteenth-century experimental psychology.

This is a field of inquiry that should be highlighted because there is an important connection between the experimentalization of the psychic world and the sensory and perceptual arrangements generated in the cinema. One of the earliest formulations of the problem concerning the overcoming of the dualities between image and movement, consciousness and space, intensive and extensive, was actually provided by the science of psychophysics as developed by Gustav Fechner, a student of Eduard Weber's, in his *Elements of Psychophysics* (1860). Epistemologically, Fechner's psychophysics stems from the kind of skepticism regarding sense perception that is caused by the disjunction between sensation and its external cause as postulated by Johannes Müller's doctrine on specific nerve energies. Fechner conceives this disjunction as "inclusive" rather than exclusive: the disparity between our sensations and their cause does not mean that subjective phenomena remain beyond the reach of quantification. On the contrary, what was important in Fechner's treatment was that it considers subjective experience in terms of intensive magnitudes. Subjectivity becomes a quantitative instead of being a qualitative phenomenon.[3] In other words, "interior" phenomena like perception and consciousness are by nature attainable through the measurement of external sensory stimuli. This is based on the view that the relationship between what Fechner understands as psychic and physical energies is functional: "In general, we call the psychic a dependent function of the physical, and vice versa, insofar as there exists between them such a constant or lawful relationship that, from the presence and changes of one, we can deduce those of the other."[4] Even though the relation between sensation and external stimulation is disjunctive, it is predictable and calculable. To this end, Fechner called his method "a just noticeable difference" (JND), which would provide measurable units of sensation, that is, magnitudes of varying intensity.[5]

What becomes essential in psychophysics is the notion of a measurable threshold. Fechner derives the measurable units of sensation from the thresholds of different senses indicated by the magnitude of external stimulus necessary to cause the least noticeable sensation. These are obtained from the experimental situation in which test subjects respond to various magnitudes of sensory stimulation in order to judge the limen of their perception – a procedure that opens up the possibility of quantification, rationalization and the increased modulation of human perception and sensation.[6] However, the notion of the threshold also includes, as Fechner noted, "a certain paradox" regarding the emergence of sensations only after the stimuli have reached a certain intensity. In other words, the notion implies the existence of stimuli that remain below the threshold of consciousness and which Fechner considers "unconscious," designating them with negative values (the threshold being zero and conscious sensations have positive values).[7] Consequently, the quantification of subjectivity that psychophysics initiates presumes phenomena that belong somewhere be-

tween unconsciousness or anesthesia and a sensation we are conscious of. These phenomena introduce discontinuity into perception and consciousness. As Jonathan Crary argues, by pointing out the liminal states, the notion of the threshold shows that the apparently uniform perceptual experience itself is fragmented by more or less qualitative discontinuities.[8] Furthermore, lacking essential continuity, perception and consciousness become mechanically decomposable.

What troubled late nineteenth-century experimental physiologists and psychologists were the automatic reactions that occurred prior to the threshold of consciousness as well as the limen that separates them from voluntary, conscious action. These were studied in laboratory conditions employing various measuring and recording instruments. Alfred Binet explains the technical organization of a psychological laboratory established in Paris in 1889: six categories of different kinds of apparatuses include, among other things, machines used in physiology such as the myograph and the sphygmograph, Marey's chronograph, psychometrical machines such as the chronoscope, and diverse apparatuses for measuring sensation and memory.[9] The so-called first laboratory of experimental psychology established in Leipzig in 1878 by Wilhelm Wundt served as the laboratory's model. Regarding the project of experimental psychology in general, Wundt outlines that its primary objective is the "exact description of consciousness." The description is achieved by a decomposition of consciousness into its constituent elements, which pass from sensations and perceptions to "representations," that is, ideas of which the succession and association Wundt considered to be the basis of higher forms of "apperception" (concept formation, judgment, thought, and so on). Regarding methodology, the project relies on instrumentation. First, sensations are analyzed by employing Fechner's psychophysical calculations. Secondly, inspired by Hermann von Helmholtz, Wundt posits that auditory and visual perceptions should be approached through simulation by means of the mechanical composition of sounds and the stereoscope, respectively. Thirdly, the method for decomposing representations is based on the notion of psychological time and its measurability. For Wundt, this relies on experimentation on reaction times carried out with the Hipp chronoscope.[10] The reaction experiment was used to determine the time needed to apperceive perceptions, a process whereby elements of physiologically determined experience are transformed into representations. Wundt approaches this process by utilizing the concepts of the visual field (*Blickfeld*) and the visual point of attention (*Blickpunkt*). The former designates the field of consciousness in general, whereas the latter designates the act of apperception. Thus the reaction experiment reveals the duration of the formation of conscious representations.

In 1876, while promoting the methods of experimental psychology in France, Théodule Ribot characterized consciousness as consisting of "a discontinuous

series of states of affairs separated from each other by short [temporal] intervals."[11] Crary notes that in the late nineteenth century, in general, a model of subjective experience arose that regarded consciousness not as a homogeneous sphere fully present to itself and to the world but, rather, as a disjunctive assemblage of moving contents that varies according to the levels of clarity and awareness, vagueness and responsiveness.[12] Since it is not a self-identical entity, consciousness also becomes something that can be put – and therefore always already "is" – under constant modulation and variation. In this respect, it is symptomatic, in Wundt's view, that the arrangement of the experimental situation should be organized so that test subjects remain isolated from each other and the experimenter. Criticizing this sort of an arrangement, Binet writes:

> The subject is made to successively perceive the intervals to be compared. They have to respond to one of three questions formulated beforehand: "equal," "bigger" or "smaller." The subject cannot comment on these responses because they are transmitted via electric signals... In this way, one does not expect the subject to have any conscious consideration, and they are prevented from paying attention to internal phenomena that may be generated. They are reduced to the role of an automaton.[13]

Wundtian test subjects are reduced to neurophysiological beings responding to varying sensory and affective intensities, and in the process they lose, according to Binet, spontaneity, that is, their very subjectivity. Or, as Didier Deleule argues, the living machine produced in the experimental situation is made to function like a "lifeless machine" in order to reduce the ambiguity of the subject's behavior to a minimum and incorporate it into a set of constants.[14] Concerning the problem of overcoming the duality of consciousness and space, then, what the proponents of experimental psychology came up with was the following: one can pass from the order of quantitative movements to qualitative images, and vice versa, by turning the test subject into an affective and "unconscious" conglomeration of technological intensities and forces, by rendering the subject as a moving image, a Golem of sorts.

A particular development in this respect takes place when the application of psychological measurement shifts from subjective experience to human actions as performances, that is, when the individual's capacities are given a quantitative structure.[15] The German psychologist Hermann Ebbinghaus, a pioneer in the experimental study of memory, developed a method for quantifying memory through the "exact measurement" of an individual's achieved performance in memorizing and reproducing series of nonsense syllables.[16] Linguistic apprehension thus becomes a matter of calculating the nonsense. Concerning the quantification of "will-times," times of choice, and those of perception and reading, James McKeen Cattell, a major figure in the development of psychology in the United States and a student of Wundt in Leipzig, pointed out that

"The processes of perception and movement may be regarded as psycho-physical, but it is also possible to measure the time needed to remember, to form a judgment, and in the association of ideas."[17] Among the machines Cattell used in his experiments was the tachistoscope, an apparatus that emits visual stimuli – light but also pictures, words and symbols – from two or more stationary sources separated by a regular interval. Since the duration of each stimulus is extremely short, the device operates on the thresholds of conscious perception and expressly focuses on the slow durations of the human nervous system.

As such, the tachistoscope can be considered prefiguring cinematographic perception triggered by the automation of movement and montage. Both are based on the technological production and mapping of the fleeting "presences" and intensities of the human nervous system.[18] Consequently, both solicit automatic responses instead of synthetic judgments.[19] With the shock and luminous effects that it emits, the tachistoscope or, in Friedrich Kittler's words, "the twin of the movie projector,"[20] instantiates the modern body defined as a field of technological forces, and at the same time, as an unconscious machine – too much light, too intense a shock, produces the loss of sight, a momentary blindness. The conjunction between the shift from introspection to experimentalization of subjectivity and the emergence of the moving image accordingly begins to become tangible. Both point to a field of experience that exceeds the thresholds of human sensation and perception, that is, to darkness and shadows separated from the beam of light of consciousness. Both point to processes in which qualitative images (sensations and representations) merge with quantitative movements automated by the machine.

This situation aroused some critical responses of the mechanistic and associationist approach in psychology. Some preferred the indetermination of human behavior, such as Henri Bergson, whose philosophy attempted a significant reconfiguration of the relationships of vision, consciousness and the world.[21] Bergson deemed the one who reacts to incoming stimuli without the self interfering a "conscious automaton," and characterized the majority of our daily life as a series of reflexive acts.[22] This is also one of the principal aspects of Bergson's critique of cinema because the cinematograph, according to him, only reproduced the composition of our corporeal and intellectual schemata in its mechanics.[23] Moreover, Walter Benjamin, in his analysis of the emergence of mass culture in conjunction with the cinema, was inspired by Bergson's critique, and saw that the reaction to and integration of incoming nervous shocks from the increasingly technologized environment results in an experience that is associated with corporeal automatisms and the deprivation of memory and thought. Benjamin perceived cinema as approximating the experimental tests in which perception conditioned by physical shocks was established as a "formal principle."[24] However, Benjamin's critique continues, as Miriam Hansen has shown,

because Benjamin, in addition to the general anaesthetization that the notion of shock implies, also regards the cinema as a type of "innervation," referring to moving images as having the potential for novel kinds of aesthetic and bodily experience and psychic disposition.[25] Innervation implies a two-way process of the conversion of mental, affective energies into a somatic, motoric form, and vice versa, thus offering ways in which material images may yield new modes of consciousness and apprehension. In any case, the notions of shock and innervation, generally speaking, both view cinema as a neurophysiologically grounded type of sensory and psychosomatic experience that solicits motor responses and affective binding, based on a fundamental reversibility between the media technology and the body.

Thus it gradually becomes apparent how the change of the perceptual field related to the modulation of sensation and consciousness in the experimental situation finds its follow-up on the silver screen. In applying Deleuze's argument about perception in the cinema to this late-nineteenth-century socio-technological context, we can see how it is exactly the technologically produced moving image that erases the psychological distinction between the image as psychic reality and movement as physical reality.[26] As Deleuze suggests, the moving image generates a zone of indistinction between the inside and the outside: it does not relate movement to any general, transcendental order (e.g., consciousness) but, instead, recomposes movement arbitrarily from serial points in time, in this way capturing perceptual synthesis into its own mechanics.[27] At the basic level, cinema plays on perceptual thresholds occupied by intervals of motion succeeding each other so quickly that the brain is unable to detect them, that is, to make a distinction between the inside (images in consciousness) and the outside (movements on the screen). Cinema, like Fechner's psychophysics or experimental psychology in general, entails a mode of consciousness not as a homogeneous sphere but as a disjunctive assemblage of moving contents that waver on an uncertain threshold and remain constantly susceptible to falling into the unconscious. This is what Maxim Gorky alluded to in 1896 when reviewing the first Lumière picture show in Russia. Regarding the apparent lifelikeness of moving images as fundamentally nothing more than the movement of shadows, he nevertheless noticed the modulating power of their spectral appearance: "This mute, grey life finally begins to disturb and depress you... You are forgetting where you are. Strange imaginings invade your mind and your consciousness begins to wane and grow dim."[28]

If it is not the waning of consciousness then at least it is a profound perceptual confusion that marks the aesthetics of early film, which often plays on cinema's capacity for registering the world in movement, things as pure mobility, and for generating perceptual arrangements that directly challenge the viewer. Among other things, mobile, dynamic and volatile views were achieved with

cameras mounted on a rollercoaster or in front of a locomotive such as occurred in the American Mutoscope Company's The Haverstraw Tunnel (1897), which presents one of the first "phantom rides." The film is an experiment of cinema's capacities to modulate perceptual synthesis and awareness through the purely mobile viewpoint that lacks a steady ground and accelerates in velocity. In the early accounts, Lynda Nead explains, the phantom rides were described in terms of profound physical and spatial disorientation to the point of being wrenched into the dynamic space of the film and the spectators' bodies becoming "part and parcel" of the mobile surfaces of the image.[29]

A similar experiential configuration appears in the Edison Manufacturing Company's A Storm at Sea (1900), which is an actuality film comprised of a series of separate shots on the deck of a ship during a heavy storm. It opens with two men admiring the waves in a long shot, with the movement of the ship and that of the camera being diagonal to the waves. Suddenly this viewpoint changes, and in the final scene the camera hangs on the ship's side, swinging up and down without a steady reference point and showing alternately huge masses of water and the sky filling the entire frame. The movement of the camera corresponds to the pitching of the ship and thus unravels the way in which the ship interacts with the sea. With the camera movement dynamics (attached here to a moving ship) and changing viewpoints without a steady reference point, A Storm at Sea destabilizes our capacity for perceptual synthesis and especially our kinesthetic sensation of gravity. The cut from the deck to the side of the ship encapsulates the effect of a sudden displacement as well as the lack of control over one's perception: the mobile view that uses the deck as its solid ground changes suddenly into a wildly swaying, abyssal shot filled with water and then the sky, a shot without gravity or ground for perception to become differentiated from the movement of images. The effect of this discontinuous spatial dynamic comprised of breaks and disproportion is sheer dizziness, as the film extracts movement *as such* from things and bodies (swinging, speeding) through framing, selecting and disconnecting. Crucially, viewers are no longer capable of occupying the center of their own perception but are forced to merge with the intensities of movement the film puts into play. In this way A Storm at Sea crystallizes a situation in which both the object and subject of perception have lost their points of gravity.[30]

Not surprisingly, Bergson's critique of modernity and implicitly of cinema also focuses on the problem of perceptual synthesis and continuity. In *Matter and Memory* (1896), Bergson posits the perceptual field as an aggregate of fluctuating images that affect the subject whose capacity for meaningful synthesis and action becomes ambiguous: "Here is a system of images which I term my perception of the universe, and which may be entirely altered by a very slight change in a certain privileged image – *my body*. This image occupies the center;

by it all the others are conditioned; at each of its movements everything changes, as though by a turn of a kaleidoscope."[31] The image of the world that Bergson offers here is multidimensional and volatile from the outset, one that, like Méliès's figures, lacks permanent, stabile and harmonious relationships between the figure and the ground. As Wundt's concepts of *Blickfeld* and *Blickpunkt* suggest, the contents of the visual field are in ceaseless reversal and displacement.[32] Bergson defines perception not in terms of representation but as the sensorimotor modulation of images. Perception is not just about acquiring knowledge – nor is it simply a receptor of incoming effectuation – but directed toward action. It comes from but also elicits movement: "[Perception] expresses and measures the power of action in the living being, the indetermination of the movement or of the action which will follow the receipt of the stimulus."[33] As such, perception originates from the temporal gap between the affection and reaction of the nervous system, and occurs at the center of indetermination, "my body," or, the specific image, which constitutes subjective consciousness and personality. For Bergson, "my body" organizes the world into meaningful patterns through gestures with function and purpose.

According to Bergson, it is this specific, "privileged" image as the selective horizon of meaningful synthesis and action that an individual reduced to an automaton in the experimental situation, the test subject, lacks. Crucially, the deprivation of the privileged image is what characterizes early cinema and the spectator. In A Storm at Sea, the center of perception, be it the subjective gravity or the horizon, finally sinks into the sea, as the sudden cut described above results in a kind of kaleidoscopic visuality, a dynamic system of movements that lack a center, in other words, a phenomenological "my body." Following the Bergsonian scheme, one could say that there are elementary perceptions and affects but no action, that is, no subjective synthesis. In this way, the film exemplifies how cinema participates in a general technical development that began, according to Gilbert Simondon, in the nineteenth century when machines emerged (e.g., the Jacquard loom) to replace the human subject at the center of perception and action. The functioning of these machines was no longer directly felt by the phenomenological subject, thus the "alienation" of man with respect to the machine is, as Simondon argues, not only socio-economic but also psycho-physiological by nature in the sense that the machine does not follow the "corporeal schema" anymore.[34]

A Storm at Sea plays out cinema's powers as an immersive technology in the context of modernity that, following Francesco Casetti, assigns a new, mutually interdependent but also unstable relation to the observer and the observed, the body and the image. In cinema, "the observer is 'inside' the observed world, yet with no precise place," Casetti writes.[35] Drawn into a spectacle of movement, the kinesthetic viewer is curiously lost, unable to fully coordinate

the perception and action. From another viewpoint, Méliès's performative films also problematize the sensorimotor correspondence between eye and hand. Sudden apparitions, figures constantly transforming, abrupt gestures, the conflation of cause and effect, and so on, present a profound challenge to our sense making – primarily because things and beings are constantly being dislocated and have no particular place. Neither subjects nor objects have any specific coordinates. Thus these films are like nervous gestures or the Wundtian test subject, in that they jerk, hesitate, tremble and stammer instead of stimulating meaningful action. They incorporate fleeting perceptions and material, somatic affects but not the Bergsonian privileged image, the "my body" of personal consciousness.

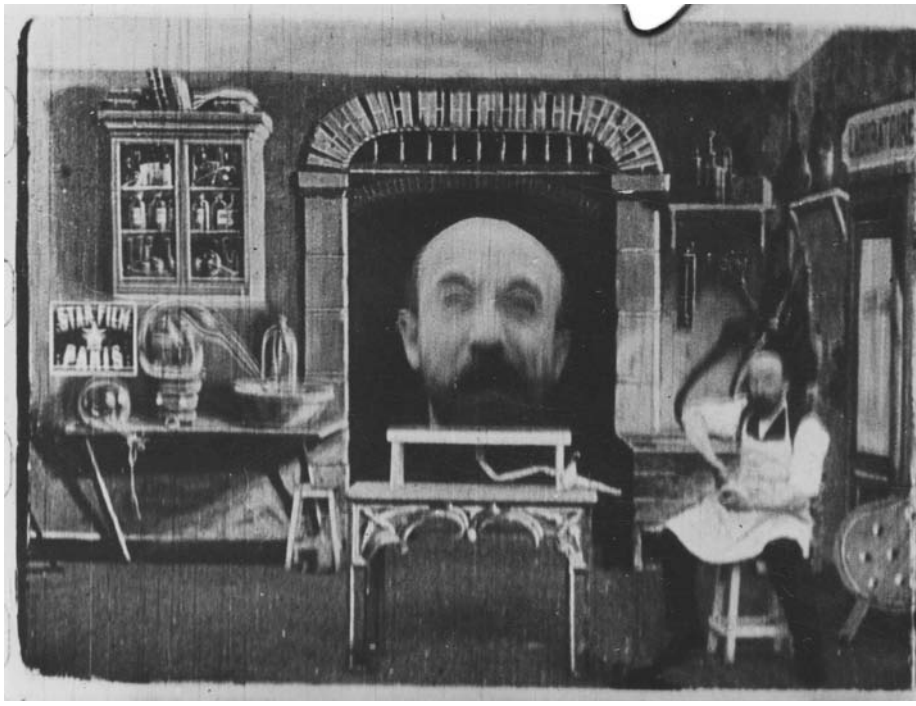

Figure 3 Still from L'Homme à la tête en caoutchouc, *by Georges Méliès (The Man With the Rubber Head, 1901)*

In one sense, we can understand affection precisely in terms of the suspension of action.[36] In affection movement is absorbed and a discontinuity between perception and action is introduced. Instead of the sensorimotor link between the eye and gesture, Méliès's aesthetics are based on a confluence between perception and affection, the eye and neurophysiological "innervation," giving rise to

fields of nervous and sensory energies that are not summoned up within fixed representations. The aesthetic function of Méliès's tricks is to express "pure" affects – affects as pre-individual and impersonal singularities. In this respect, the figure of detached heads becomes particularly interesting. In L'Homme à la tête en caoutchouc (The Man with the Rubber Head, 1901) it becomes the subject of a scientist's experiment (fig. 3). The scientist, played by Méliès, takes a living head (Méliès's own) from a box, which looks around amazed as it protests. He puts the head on a stand connected to a tube with a valve emerging from the base. Then he attaches a bellows to the tube, and the head either swells or shrinks as the scientist either pumps the air in or releases it. In its composition, the film draws on a fairly simple *trompe-l'œil* effect, which is achieved through skillful timing and the superimposition of the detached head that is filmed through a moving camera "zooming" in and out.[37] Although the background remains static and the single viewpoint is fixed throughout the film, it is this camera movement, which we cannot see but only feel, that destabilizes our perception. There is a contrast between two kinesthetic forces, the relative stillness of the background and the superimposed figure that draws closer and then withdraws – a contrast that draws on the intensive and the affective and fills the image with energetic tensions and pressures. This becomes highlighted toward the film's end, when a clown enters the scientist's laboratory and pumps the bellows until the head explodes, and the affective intensity that increases along with the tensions between the forces is ultimately released. L'Homme à la tête en caoutchouc generates and discharges affective suspense, which absorbs movement instead of carrying out a sensorimotor function and builds on the cinema's capacity to give rise to a complex dynamics of movement that takes hold of the intensive thresholds of sensation.

Bare Life

The notion of affect, which comes into critical focus here, correlates with the general problematics of modern life. Films such as the Edison Company's A Storm at Sea or Méliès's L'Homme à la tête en caoutchouc show how cinema involves neurophysiological intensities and our affective lives, engaging the thresholds of consciousness. The focus here becomes the channeling and transposition of life energies in film technology and aesthetics. This is how early cinema actually remediates its genealogical roots. In Étienne-Jules Marey's laboratory, the moving image emerges essentially parallel with attempts to track down life functions with self-recording machines. Graphic and chronophotographic recordings of movement are considered immanent to the dynamics of

life and hence suitable methods for making living beings malleable, calculable, and predictable. On the other hand, a similar approach defines experimental psychology, which directs its attention toward the technological transposability of our psychic life from the viewpoint of the affect and sensory thresholds.

Cinema thus participates in the re-articulations and divisions within which the concept of life has been shaped in Western thought, and one could even say that it emerges as a special kind of dispositif of the understanding and organization of the living. With regard to the history of these divisions, Giorgio Agamben notes that the ancient Greeks distinguished between three levels of life: *zoē* (the simple fact of living common to all living beings), *bios* (the life of an individual or a group), and *psykhe* (the "spark" or breath of life, the fact of being alive).[38] An influential description of these terms appears in Aristotle's *De Anima*, in which the philosopher characterizes the nutritive faculty or power (*threptikon*) as an elementary principle of life (*zoē*).[39] This is isolated from other life functions (movement, sensation, thought) and considered the foundation, which hierarchical articulations between other forms of life are based on. The significance of Aristotle's isolating the nutritive life, according to Agamben, lies in the fact that it also forms the basis for modern divisions between diverse modes of life and constitutes "a fundamental event for Western science."[40]

As for the conception of life in modernity, Agamben refers to Xavier Bichat's distinction between organic and "relational" or animal life in his *Physiological Researches on Life and Death* (1800). Bichat approaches the two forms of life in terms of the functions that resist death. The essence of life, in Bichat's definition, consists of "the sum of the functions by which death is resisted." He writes:

> In living bodies, such in fact is the mode of existence, that whatever surrounds them, tends to their destruction. They are influenced incessantly by inorganic bodies; they exercise themselves, the one upon the other, as constant an action; under such circumstances they could not long subsist, were they not possessed in themselves of a permanent principle of reaction. This principle is that of life; unknown in its nature, it can be only appreciated by its phenomena: an habitual alternation of action and reaction between exterior bodies, and the living body, an alternation, of which the proportions vary to the age of the latter, is the most general of these phenomena.[41]

This general view of life as an assemblage of reactive functions, defines organic life as the "habitual succession of assimilation and excretion," which includes unconscious functions such as respiration, blood circulation, excretion, digestion, and reproduction. Relational life, on the other hand, is the organism's relation to the external world and includes all of the senses and voluntary actions. Bichat describes it in terms of the animal that "lives externally, is the inhabitant of the world, and not as the vegetable of a spot only; it feels, it perceives, it reflects on its sensations, it moves according to their influence, and frequently

is enabled to communicate by its voice its desires, and its fears, its pleasures, and its pains."[42] In higher organisms, these two operate simultaneously, with the organic or nutritive life also forming the background by which humans become separated, as if from within, from non-humans.[43] As Agamben notes, "The division of life into vegetal and relational, organic and animal, animal and human... passes first of all as a mobile border within living man, and without this intimate caesura the very decision of what is human and what is not would probably not be possible."[44]

At first it seems that the problem of modern media and human life only extends to the "relational" life, which is often considered the proper human *bios* (both individual and political life) that the Aristotelian "living being that has *logos*" (*to zōon logon ekhon*) – the conjunction of the simple fact of living and language – enjoys. But as our analyses have thus far pointed out, the problem is not that simple, at least from the perspective of *technological* media. Ever since Jacques de Vaucanson built his androids and defecating duck, the obscure background of organic or nutritive life, composed of the basic functions of respiration and excretion, has also become subjected to technological modulation.[45] The mechanical duck put the basic physiological fact of living (*threptikon*) into a machine. From another perspective, that kind of transposition also occurs in Marey's research into the quantification of the nervous system's "lost time" that directly anticipated cinema in terms of mapping and controlling corporal movement. The self-recording machine modulates the elementary principle of reaction as conceptualized by Bichat, and the objective of the "diagrammatic vision" of non-human observers that traces, scans and reorganizes the intense surface of the body is the automation and calculation of movement, which is seen as the immediate expression of physiological life. This is based on the measurability of the dynamics of life implied in Bichat's definition. "The measure, then, of life in general," Bichat writes, "is the difference which exists between the effort of exterior power, and that of interior resistance."[46] Furthermore, one can say that a similar kind of vision characterizes the development of experimental psychology, which establishes itself on the modulation and measuring of the affects of the nervous system positioned at the threshold between shock and response.

Cinema has, since its inception, been situated at the threshold of where the elementary principle of reaction against death was modulated. In this sense, one could say that cinema developed into a technology of *experimental life*. For our purposes, the concept of experimental life reveals modern technological media as processes by which power and truth become incorporated into the living being, which becomes transformed and shaped accordingly. Following Crary, it was during the nineteenth century that the body, the "simply" living being, in accordance with the productive requirements of contemporary economic development and modern disciplinary states, became the object of new technologies

of control, subjection and regularization.[47] From this perspective, the emergence of the cinema is coupled with the processes of Western modernity that Michel Foucault has analyzed as a change from sovereign power to biopower and toward biopolitical societies. For Foucault, biopower is a system of relations in which "phenomena peculiar to the life of the human species" enter "into the order of power and knowledge."[48] It is no longer the Aristotelian "living being that has *logos*" and the "good life" of political subjects that power and knowledge focus on. Instead, what they are concerned with is life "as such" or synthetic life and thus biological and physiological existence rather than the animal that can speak.

The shift Foucault outlines reflects a new kind of logic between life and death. Sovereign power, according to Foucault, is based on the unconditional threat of death – and one could also say, on the capacity to imagine and conceive of death and thus represent it as the ultimate banishment. This is a capacity that Martin Heidegger considered essential in the use of language to make sense of the world.[49] Biopower, however, is based on taking charge and caring for life itself. Foucault notes that

> the fact of living was no longer an inaccessible substrate that only emerged from time to time, amid the randomness of death and its fatality; part of it passed into knowledge's field of control and power's sphere of intervention. Power would no longer be dealing simply with legal subjects over whom the ultimate dominion was death, but with living beings, and the mastery it would be able to exercise over them would have to be applied at the level of life itself...[50]

Control (knowledge) and intervention (power) aspire to become immanent to life itself. Within this development, "the simple fact of living" is distributed among the domains of value and utility as well as their calculation. According to Foucault, biopower "exerts a positive influence on life, that endeavors to administer, optimize and multiply it, subjecting it to precise controls and comprehensive regulations."[51] This is how modern technological media in particular operate. The life functions that resist death such as respiration, heart pulse, gait, and corporeal work in addition to sensory, perceptual and cognitive dynamics are harnessed, measured and calculated, and, in this way, also rendered malleable and flexible so that they become enhanced and are made more efficient in the capitalist machinery of production and consumption.[52] Modern technological media, and foremost cinema, thus contribute to the goal of what Foucault calls a "threshold of modernity," a situation in which "the life of the species is wagered on its own politics" and the Aristotelian *zōon politikon* – essentially, the speaking animal – is called into question and perhaps ultimately reduced to its bare essence of living (*zoē*).[53]

However, as Agamben points out, this process should not be simply understood as the introduction of natural life into the political order. Instead, it can be seen as an instantiation as well as a transformation of the essence of Western politics, which focuses on what Agamben calls "bare life" – the very boundary between *zoē* and *bios*. According to Agamben, "the realm of bare life, which is originally situated at the margins of the political order, gradually begins to coincide with the political realm, and exclusion and inclusion, outside and inside, *bios* and *zoē*, right and fact, enter into a zone of irreducible indistinction" in the disciplinary state and modern biopolitics.[54] In other words, in modernity the liminal state between natural life and political life becomes both the subject and the object of political power. From this perspective, the experimentalization of life in the nineteenth-century physiological and psychological laboratories and in today's technological media presents exactly the zone of indistinction between *bios* and *zoē* that characterizes biopower and modern biopolitics. In Agamben's words, "'experimental life' is a *bios* that has, in a very particular sense, so concentrated itself on its own *zoē* as to become indistinguishable from it."[55] As the concept is understood, experimental life is a mode of life generated within modern media, and signals a set of technologically supported physiological functions indistinguishable from diverse machinic arrangements. Experimental life is essentially machinic or technological, situated in a liminal state between the organic and the mechanical, the living and the dead, the human and the inhuman, or the unconscious and consciousness.

Hysteria

One of the dimensions of bare life that Agamben introduces is a form of "affectability" that is defined as "a simple organic capacity of affection without personality."[56] Cinema, as we have seen, emerged as a technology based on the modulation of that capacity. Élie Faure noticed how cinema makes technology and affectivity reversible and how, based on this reversibility, the material automatism of cinema gradually becomes accommodated by the psyche.[57] Similarly for Benjamin, cinema appears as a mode of affectivity, which implies a direct, impersonal and unconscious assimilation between technology and the living being. In this sense, affectivity in cinema correlates with psychogenesis on both a-personal and pre-individual levels.

This becomes manifest in cinema's genealogy. In continuing this line of exploration, one should note that alongside the emergence of the moving image in the late nineteenth century, many new configurations and conceptualizations of the psyche, especially in its pathological states, were being generated in areas

of research dealing with the affliction known as hysteria. Although the problem of hysteria presents a highly varied phenomenon, which gave rise to new conceptions of sexuality, the self, the unconscious and memory, the treatment here will be restricted to the "psychophysiological" as performed by Jean-Martin Charcot and the so-called Salpêtrière school – a view which is significant in that it initiated the process of perceiving the psyche as a clinical entity as such.[58] According to Charcot, hysteria is a special nervous affliction. Heredity provides its principal cause, whereas the hereditary predisposition can be catalyzed by a variety of "minor" factors – *agents provocateurs* – ranging from syphilis and diabetes to imitation, nervous shocks and extreme religious practices. One crucial aspect of Charcot's conception of hysteria is that it deviates from previous theories that associated the disorder with female genitalia and proposes that hysteria has a neurological cause, that is, it is brain related rather than caused by the uterus.[59] As such, hysteria leaves no traces within the organism, and Charcot coined it a "dynamic" or "functional" lesion to account for the origins of the disorder. Deprived of various anatomical substrata, hysteria is caused by a dynamic lesion in the nervous system that alters the function of a particular organ but not its structure. The hysterical lesion – "fugitive, labile, always susceptible to disappearing," as Georges Didi-Huberman described it[60] – resists localization in a specific structure in the depths of the body. Instead, it falls into observation through its functioning on the bodily surface. Charcot believed that hysteria was a neurosis *sine materia* that could, nevertheless, be detected by employing various (technological) media that track it down on the visible, observable surface of the body.[61] As a precursor of impersonal affections in the cinema as exemplified by Méliès's work, it expresses itself in abnormal movements, tics, spasmodic jerks, etc., and in various physiognomic signals such as grimaces, laughing and yawning.

Charcot's approach is based on the visible expression of hysterical symptoms, which meant "to gaze, to look, to keep looking, always."[62] Charcot considered hysterics, who were mostly female, although after the 1880s it also included working-class men as well, to be mute or even senseless and deprived of subjective interiority. Instead of the patients' "incessant babbling," visual symptoms fill the space of knowledge.[63] Through repeated observation, these symptoms would ultimately reveal the fundamental structure of the disorder, its "clinical type." Sigmund Freud, a student of Charcot's in the period 1885-86, observed that the types "could be brought into prominence with the help of a certain sort of schematic planning, and, with these types as a point of departure, the eye could travel over the long series of ill-defined cases – the '*formes frustes*' – which, branching off from one or other characteristic feature of the type, melt away into indistinctness."[64] In *Études cliniques sur la grande hystérie ou hystéro-epilépsie*, Charcot's disciple Paul Richer even managed to create a tableau based on

photographically slowing-down motion, which presents the gestures and corporeal attitudes of diverse stages or periods of hysterical crisis and their variations.[65] It seems that emphasizing the visual manifestation of the nervous disorder partially prevents its interpretation in other than physiological and neurological terms. This becomes explicit in how Richer explains the third period, that of the *attitudes passionnelles* or "plastic poses." It consists of hallucinations that influence the subject's comportment, ones that, according to Richer, are produced either by the imagination or by traumatic memories attached to painful emotions. Richer interestingly points out that in the latter case, "the subject of these hallucinations is most often drawn from the patient's past," and that hallucinations may be reproductions of scenes from youth, for example.[66] But despite these momentary glimpses into memories that may have affected the psyche, the principal framework of learning about the disease relies on (technological) images of the body's expressions and movements. The subject becomes seen and understood in terms of bodily dynamics that are noted on the image surface.

It is crucial, as Pierre-Henri Castell points out, that within this referential framework, hysteria actually becomes a disorder "without visibility" more than one *sine materia*.[67] The invisibility of the neurosis forms the problematic core of knowing the disorder itself. In the process of "solidifying" fugitive and ephemeral hysterical lesions, the master's eye becomes dependent on several technical instruments. Charcot outfitted his clinic of nervous disorders with numerous self-recording machines such as Marey's myographs, tachistoscopes and even a photographic studio, thus converting his clinic into a kind of experimental laboratory. The hysterical body, a "mystery of sensations," was gradually instrumentalized until Charcot was criticized for not actually healing his patients but only experimenting on them.[68] Thus, what remains invisible has to be brought into existence by the practices of modulation. This problem anticipates cinema because it concerns movement and immobility, especially since there are two major techniques with which hysterical trauma are reproduced and brought to the fore: hypnosis and photography.

An influential French neurologist during this era was Hippolyte Bernheim who characterized hypnosis as "mental decapitation."[69] The allusion to Méliès's detached and multiplying heads is rather clear, and interestingly with respect to these figures, hypnosis was associated with the occurrence of double and multiple personalities. More generally, however, hypnosis would eventually demonstrate the malleability of consciousness and the existence of unconscious phenomena, although the latter were mostly considered in terms of corporeal automatisms. For Charcot, hypnosis disclosed the existence of and the possibility of manipulating the "parasitical" ideas isolated from the conscious self: "We know that in subjects in a state of hypnotic sleep it is possible... to originate by

the method of suggestion, or of intimation, an idea, or a coherent group of associated ideas, which possess the individual in a parasitical manner, and remain isolated, and manifest themselves by corresponding motor phenomena."[70] According to the Charcot school, hypnotic states are divided into three periods: lethargy, catalepsy, and somnambulism.[71] They are provoked through the intermediary of the sensory nervous system (skin, audition, sight, etc.), and by means of suggestion as well as diverse physical agents such as light, sound, temperature, and magnetism. Hypnotizability is a symptom of hysteria, and with the help of hypnosis, the trauma, or the functioning of the "dynamic lesion," can be observed experimentally. As the psychologist Pierre Janet noted in his Charcot's obituary:

> One of the essential characteristics of this affection, its extreme *malleability*, lets the subjects be transformed in thousands of ways and produce in them the phenomena that one wants to study; especially the modifications that *hypnosis* can produce in the patients make it possible to experimentally study the facts that have hitherto been considered as pure objects of observation.[72]

Hypnosis is a tool that alters both corporeal and mental functions, a tool that invokes, reproduces and undoes various types of hysterical states. For example, hypnosis allows one to "artificially reproduce" paralyses, and thus experimentally verify the existence of these parasitic ideas themselves. Charcot reported how a hypnotized patient experienced that "*the member struck did not belong to her, that it had become strange to her.*"[73] In Charcot's hands hypnosis may result in the "annihilation of the *ego*," which is due to artificially fixed ideas of motor incapacity. As such, it is a technology for unlocking unconscious forces and rendering the body as the site where these forces can be experimented on. From this viewpoint, hypnosis should be considered an experimental method that produces simulations of hysterical symptoms, e.g., simulations of the parasitic self.[74]

In fact, it can be argued that hypnosis even simulates simulation, since simulation in terms of voluntary action and deception was commonly considered intrinsic of hysterical behavior. Charcot described how attempts of this kind of feigning, even for no other reason than the cult of "*l'art pour l'art*," were symptoms of hysteria. On the other hand, however, his aim was to prove a disjunction between hysteria and its pretenders, and to verify the disorder's material reality. In one demonstration, which was in accordance with the era's technoscientific mode of perception, self-recording machines were utilized to trace the difference between the cataleptic state of a hypnotized hysteric and the one that simulated it: the curves of the pretender's respiration and reaction times differed significantly from the ones of the cataleptic (fig. 4).[75] However, simulation of another kind can occur on an "unconscious," physiological level which re-

mains invisible from experimental techniques. Charcot observed that it was common for those suffering from hysteria to steal the symptoms of other more organic or neurologically based disorders and mimic them, as was the case of hysterical paralysis that Charcot pointed out: "Now, observe, I do not say *imaginary paralyses*, for indeed these motor paralyses of psychical origin are as objectively real as those depending on an organic lesion; they simulate them... by a number of identical clinical characteristics, which render their diagnosis very difficult."[76] Charcot called this ability of the affection *sine materia* to simulate organic diseases to the point of indistinctness "neuromimesis."[77]

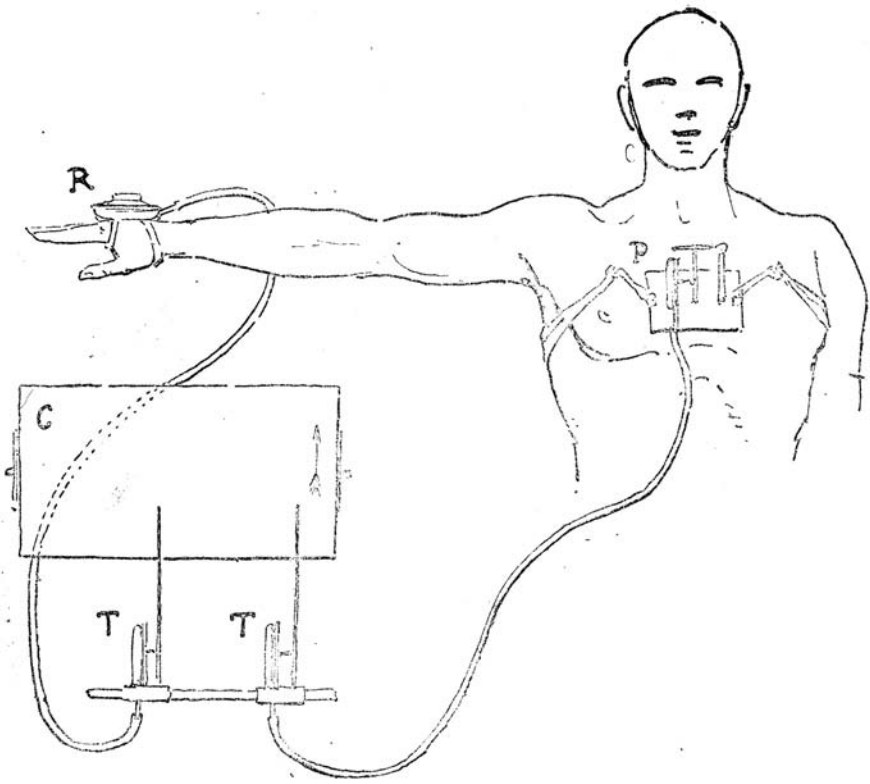

Figure 4 Drawing by Jean-Martin Charcot, Clinical Lectures on Diseases of the Nervous System*, vol. 3, ca. 1880. The illustration shows the technical arrangement of the demonstration, including Marey's apparatus for quantifying reaction times*

The neuromimetic simulation pertaining to hysteria, however, should not be simply regarded as a process of exchange between the "organic" and the "psychic" but, more fundamentally, something located between the neurophysiological being and experimental technologies themselves. Hysterics actually derive from the same epistemological and ontological formation as Vaucanson's duck and Marey's skeletons. They "automatically repeat certain words" in addition to bodily postures and gestures, for example.[78] Accordingly, hysterical bodies are out of conscious control and are thus judged to be automata of some sort or self-recording machines. Conforming to the emergence of new technological media, Janet compares how cataleptics imitate words they hear to the processing of senseless engravings by the phonograph.[79] Charcot, for one, noted how hypnotized subjects were, in fact, kinds of machines:

> [O]ne can call into existence an idea, or a group of ideas connected together by previous associations. But this group set in action will remain strictly limited. There will be no propagation, no diffusion of the communicated movement; all the rest will remain asleep. Consequently the idea, or group of ideas suggested, are met with in a state of isolation, free from the control of that large collection of personal ideas long accumulated and organised, which constitute the conscience properly so-called, the *ego*. It is for this reason that the movements which exteriorly represent the acts of unconscious cerebration are distinguished by their automatic and purely mechanical character. Then it is truly that we see before us the *human machine* in all its simplicity, dreamt of by De la Mettrie.[80]

As this quote quite directly demonstrates, hysteria became perceived and understood in a body that was technologically malleable and even considered a kind of machine. The hysterical body thus converges with the test subject produced in the laboratory of experimental psychology. Similarly to the mechanical arrangements of the test situation, in hypnosis "the *mental spontaneity*, the *will*, or the *judgment*, is more or less suppressed or obscured, and suggestions become easy."[81]

This brings us to the second major technology that sought to (re)produce and render hysteria as visible and knowable, instantaneous and serial photography. During the period 1876-80 Désiré-Magloire Bourneville and Paul Régnard published *Iconographie photographique de la Salpêtrière*, the famous four-volume journal on hysterical and epileptic disorders that consisted of clinical observations and photographic illustrations of the diverse stages of disorders. The publication preceded the establishment of the photographic studio at Charcot's clinic in 1882. Albert Londe, a professional photographer and a friend of Marey's, became its head two years later. Londe introduced Muybridge's and Marey's methods to the Salpêtrière. In 1883, Londe constructed his nine-lens "photochronographic" camera, and one with 12 lenses in 1893. He explained the

photographic and chronophotographic methods in the analysis of nervous disorders:

> In the study of certain nervous affections, such as epilepsy, hystero-epilepsy and the great hysteria where one encounters attitudes, essentially transient states, photography is an indispensable means of retaining an exact image of these phenomena that do not last long enough to be analyzed by direct observation. The same holds for hypotheses in which movements are too fast for the eye to catch. This is the case in epileptic seizures, hysterical attacks, pathological gaits, etc. In these particular cases, the inability of the eye is easily circumvented thanks to photochronographic methods...[82]

One of the main functions of chronophotography is to slow down and arrest fugitive hysterical symptoms, to render them decomposable, analyzable, quantifiable and predictable, and, in particular, separate malingering from "real" manifestations of the disorder. Hysteria, then, gains its reality when made visible through technologies of the moving image.

According to Ulrich Baer, the photographic studio provides an ideal experimental set-up in this respect.[83] The dark room where the patients are guided to for the first time, is where an intense flash of light provokes the cataleptic, lethargic and somnambulic states. The production of hysterical symptoms can be "repeated infinitely," and photographed during each step of the experiment so as to separate genuine hysterics from the pretenders. Photography then assumes the status of a diagnostic tool. But simultaneously, as Baer has pointed out, the hysterical body becomes a site of technological production, composed at the illuminated instant when photographic inscription occurs. Baer argues that the lack of anatomy and neurology in hysteria suggests that "the hysterical patient simply imitated what she saw, namely, the lens of a camera, and that her symptoms corresponded to an understanding of the body as a machine."[84] What occurs is a neuromimetic relationship between the body and the media technology, one brought forth during the experimental physiological and psychological process. The dynamic lesion appears thus as modulated by technologies of mechanical inscription. The experimental, bare life that the hysterical body crystallizes in its distorted gestures, spasmodic jerks and abnormal physiognomy is rendered visible and known – and thus brought into existence – by modern technological media.

Neuromimesis and Mutism

That kind of neuromimetic affectability concerns not only hypnosis or chronophotography but also cinema. This is suggested by how hypnosis and hysteria become "remediated" in early cinema. Méliès's Magnétiseur (The Hypnotist at Work, 1897) and the Edison Manufacturing Company's Mesmerist and Country Couple (1899), as continuations of the photographs in *Iconographie photographique* or experiments with hypnosis at the Salpêtrière, for instance, present rigid lethargic bodies stretched between two chairs under the spell of a hypnotist. In Mesmerist, a man and a woman enter a hypnotist's office (long shot), and suddenly, as the hypnotist gesticulates manically, the two people and various objects begin to disappear and change position. In the middle of film, the hypnotist turns the man into a rigid lethargic body that is suspended between two chairs. Here we see the substitution trick as something directly connected to the hypnotist's powers to transform and manipulate bodies, while the cinematic medium is defined in respect to hypnosis: cinema's visual effects appear as strange and alien as the body parts of the hypnotized hysterical patient with induced paralysis. One could say that the tricks of sensation in these films presuppose the hysterical or neuromimetic body. When the modern medium of moving images captures the nervous system, it exceeds the latter's capacity to differentiate between what is emitted from the inside and what comes from the outside. The cinema utilizes the nervous system and gradually starts to simulate the functioning of the unconscious automaton. Thus, it simultaneously surpasses the symbolic (conscious representation) and becomes immanent to the body in its bare materiality – it has been neurological from the very beginning.

Reciprocally, cinema has also been "pathological" from its inception as a kind of nervous gesture. In his review of the 1896 Lumière program, Gorky was already alluding to the fact that there is a pathological component implied in the cinematic experience, a pathological aspect in the submission of the body to the rhythms of the moving image. Early film critique, according to Rae Beth Gordon, often referred to the cinema's "reality effect" in terms of unconscious imitation and articulated how the moving image triggered automatic neurophysiological responses, comparing the suggestive power of the image to hypnosis.[85] Based on these observations, among other things, Gordon aptly argues that nervous gestures actually manifest an intensified form of movement automated in the cinema, whereas "the intensely felt *reality* of the film image is due... to the automatic reactions of the muscles and nervous system in response to the movements on screen."[86]

The movement that is automated in cinema embraces the physiological real and entails a sort of neuromimetic coupling, that is, a modulation of affects in

which the rhythms of the neurophysiological apparatus become those of the image. Friedrich Nietzsche came very close to conceptualizing this kind of visual experience just as the moving image was emerging, with his notion of "applied aesthetics" developed in his later notes. Nietzsche considered acts of interpretation such as hearing and reading as basically muscular activities and understood art not in terms of beautiful forms or moral judgments but in terms of "organic functions" of instinctual and affective life. Art encapsulates "tragic" forces of nature and ignites them within us in their original ecstasy and inebriation (*Rausch*).[87] Art, then, becomes regarded as "suggestion,... as the zone of invention of psycho-motor induction."[88] Nietzsche here refers to Charles Féré's concept of psycho-motor induction, which designates how (re)action is immediately induced by external stimuli in the sense that every sensation already involves a motor response. For Féré, who began his career as Charcot's assistant, this induction applied specifically to affective states that exceed attentive recognition or representation: "Psycho-motor induction plays a considerable role in the contagion of emotions and feelings. The sight of a movement instigates the reproduction of this movement; the expressions of physiognomy which translate emotions are susceptible to reproducing themselves in the same way, beyond any state of consciousness."[89] Psycho-motor induction applies to the nervous system's non-conscious actions and affections. Crucially, in this respect, as Crary points out, Féré's work is "part of a larger *instrumental* relocation of vision from a disembodied and punctual system of images to an interplay of forces and motor reactions in which representations play an irrelevant role."[90]

Accordingly, Nietzsche understood vision not as the representation of static pictures but as the induction of affects transposable in graphic presentations produced by the dynamometer, a device that measures the pressure exerted by the handgrip of an experimental test subject when the subject is exposed to different kinds of stimuli. In Nietzsche's thinking, the role of the image extends to encompassing the interplay of material forces and motor reactions.[91] As such, Nietzsche's physiological aesthetics is very similar to the kind of visuality we analyzed in Méliès's L'Homme à la tête en caoutchouc, regarding how film draws upon contrasting kinesthetic forces and affects that converts the movement of figures into various kinds of muscular tensions and pressures. Functions such as representation and making meaning, which was traditionally also assigned to images, become less important in relation to the physiological excitement of film.

What is significant with respect to the disintegration of conscious representation and reference that is implicated in the generation of experimental life, the hysterical, neuromimetic body appears to be deprived of the capacity to produce articulate speech. Charcot observed that hysterics either babbled or simply remained silent. This points to how the world's apprehension in linguistic cate-

gories or "concepts" in the modern media technological situation becomes more or less controversial. In Rainer Maria Rilke's description of visiting a clinic at the Salpêtrière in his semi-autobiographical novel *The Notebooks of Malte Laurids Brigge*, the only evident sound is the rattle of self-recording machines followed by a rather nonsensical exchange of verbal utterances combined with obstinate muteness or, perhaps, an inability to speak.[92] Rilke alluded to how, within the modern media of functions resisting death, it is precisely the linguistic "function," the production of articulate and meaningful sentences, that withers away or is at least severely altered. This is similar to Ebbinghaus's experimental observations on memory, where the nonsensical syllable and not the word (a signifying unit) becomes the focus.

In cinema as well, it is both perceptual and linguistic syntheses that are subordinated to the technological real.[93] A case in point is the virtually endless film loops produced by Marey's colleague Georges Demeny in his experiments on "filmed speech" with animated chronophotography. Demeny's goal (including his desire to make his devices commercially viable) was to come up with a tool for the instruction of deaf and mute people. One of the series of images, published in *La nature* in 1892, presents a mouth silently gesturing "Vi-ve la France!" that, when automated, opens and closes, and opens and closes again, virtually *ad infinitum*. Demeny reported on his experiences with deaf-mute pupils:

> One of these children immediately read the photographed phrase. But as the photographic print begins as a continuous series, the end of the very same phrase immediately followed the beginning of the phrase. Consequently, the deaf-mute had no accurate indication of where to begin reading, and he could cut off the phrase at any point whatsoever.[94]

Ironically, with respect to Demeny's purposes, filmic repetition pushes language to its limits, stripping the phrase of significance. What seems to obviously be lacking in cinema's technological configurations is the clear and distinct articulation that Aristotle termed *logos*, as the articulation itself is relegated to the arbitrary instants by which the medium inscribes movement.

The moving image, at this stage, does not comprise of the communication of meaning, but rather the muscular dynamics of facial movement. It traces the bodily surface and its physiological texture but does not make things legible. From another viewpoint, the deprivation of signification and representation in cinema is shown in a so-called scientific film, La neuropatologia by Dr. Camillo Negro, the director of a psychiatric clinic in Turin, in collaboration with cameraman Roberto Omegna. La neuropatologia was first screened on February 17, 1908, and was comprised of a series of films featuring neuropathological patients. But, alas, a large portion of this has since been destroyed. For Giuliana Bruno, La neuropatologia "constitutes a filmic version of the photographic

spectacle of hysteria initiated by Charcot at the Salpêtrière in Paris in the late 1870s."[95] Bruno cites a contemporary film reviewer who emphasized the parallel between the cinematographic image and clinical cartography of the body: "Prof. Negro … commented on the parade of all kinds of neuropathic types, affected by organic hemiplegia, contracting paralysis, epileptic attacks, hysteria, different types of Saint Vitus' dance, pathological postures, paralysis of the eyesight, etc. The filmic image was so sharp that we thought we were in a clinic."[96] Comparing cinema with psychopathology and neuropathology, La neuropatologia belongs to medical and, more precisely, neurological cinematography, a territory, which was initiated rather early in film history, by, among others, Albert Londe at the Salpêtrière and the Rumanian neurologist Georges Marinesco who, having studied at Charcot's clinic, arranged his first cinematographic recordings of hysterical and neuropathological cases in 1898.[97]

What occurs in La neuropatologia is a nervous crisis. The camera is situated in a room with a large bed occupying the foreground; a female patient accompanied by Dr. Negro and his male assistant are standing in front of the bed (three-quarter shot). The woman is dressed in a black gown and her face is partly covered by a black mask. She is conversing with Dr. Negro, perhaps about her symptoms, and pointing to her throat with her right hand, as she suddenly bursts into a nervous fit, collapses onto the bed, her body writhing rapidly and full of rage. It is this unexpected and violent instant when the body loses control that marks a decisive, even singular moment in this film as well as in cinema in general – a moment when life as such, in its saccadic rhythms and unconscious energy, becomes manifest. After her fit, the male doctors move in to grab her limbs. The subject descends into a cataleptic state, which Dr. Negro verifies by shaking the phlegmatic patient while looking off-screen and gesticulating toward the camera's back. Finally, after a temporal jump-cut, the exhausted patient becomes noticeably calmer as she is "consoled" in Dr. Negro's arms.

La neuropatologia, as an example of physiological and neurological cinematography in general, shares a passion for the fragmentation of the body as well as an obsession with physiology and various nervous gestures with the early cinema of attractions. The term neuropathology was pretty much synonymous with hysteria during this period, although it often encompassed a wider range of neuroses that had no organic substrata.[98] In this respect, the film should be viewed in relation to Charcot's explication of what he calls "hysterical mutism," an affection that prevents the patient from speaking but not from gesticulating. Charcot observed how a patient with a history of hysterical attacks had lost his ability to speak and indicated this dynamic muteness with a gesture similar to the one the patient uses in Dr. Negro's film:

> You see that our patient presents all the classical characteristics of hysterical mutism, such as I have been describing. When told to call out, to speak, or to whisper, he is absolutely unable to comply. When I persist, he makes the characteristic gestures, and points with his hand to his throat as though he would tell us that the difficulty lies there. However, he moves his tongue and his lips perfectly in every direction.[99]

Patients suffering from hysterical mutism, according to Charcot, are deprived of speech because they have lost their capacity to exercise the specialized movements needed to articulate a word; they are deprived of the "necessary motor representations" required to execute the mechanism of articulated speech but not of the related "pantomimic gestures." This deprivation is fundamentally a matter of technological modulation. Charcot ends his lecture by demonstrating this form of mutism: by using hypnosis he simulates the so-called dynamic lesion affecting the larynx, although he remarks that, "I dare not allow this experiment to be prolonged too much, for I have remarked on many occasions that hysterical symptoms artificially produced during hypnotism are more difficult to be made to disappear in a waking state..."[100]

Neuromimesis, a mode of affectability originally introduced in the experimental arrangements, is the form that biopower takes in cinema. La neuropatologia presents a form of power that does not simply concern relations of force between bodies but one that acts upon actions, or, more precisely, structures possible actions through unconscious imitation that is triggered by the modulation of our bodily, affective being on the screen.[101] This form of power becomes tangible in relation to the situation of modern media in which the patient is individualized as a simple neurological being deprived of the capacity to speak. The situation is "non-invasive," it is not based on force, which is exercised from outside and would require obedience. Instead, it encompasses a power relation that operates from the inside of the body. From an inverted perspective, Foucault describes that a "man who is chained up and beaten is subject to force being exerted over him, not power. But if he can be induced to speak, when his ultimate recourse could have been to hold his tongue, preferring death, then he has been caused to behave in a certain way. His freedom has been subjected to power."[102] In La neuropatologia, this situation is cunningly reversed: the film displays how the gesture – "our speechless dwelling in language," as Agamben describes it[103] – is transformed into a machine, and our very capacity to understand or imagine any possibilities (e.g., death) other than those simulated in the present is erased. What the film exemplifies is how cinema produces mute corporeal automata by modulating life functions that resist death, the bear fact of living, in its mechanics.

The proliferation of hysterical movement and the hysterical inhibition of movement at the end of the nineteenth century is a symptom of changes regard-

ing corporeality, the biopolitical body, that were triggered by technologies of inscription and automation of movement. What comes into critical focus here in the context of the general "cinematization" of being is the concept of life itself – life not so much as a medical and scientific notion but as a political, ethical and techno-aesthetic concept. Cinematic renderings of nervous gestures, tics, jerks, and grimaces in particular entail a mode of experimental, bare life as a form of affectability. This form directly characterizes the experience in cinema that immanently captures and transforms the living body. In political terms, we have been captured in a realm of experimental life where power is inscribed directly onto the body and the distinction between private life and political existence has become obsolete. This is essentially the operation of biopower in cinema: modulation of the physiological real to the extent that its subjects are induced not to speak but, instead, to practice fundamental muteness – a speechlessness that testifies to the subject's becoming, as Heidegger puts it, a "human resource," something to be unlocked, transformed, stored, distributed and moved around in the image.[104]

3 *Umwelt*: Automatism and Affectivity

Organ Projection

The moving image is based on a specific type of technological embodiment. Images animated on the silver screen would remain unseen without a certain kind of corporeal investment that the technology of the cinema mobilizes, which involves various kinds of affective and psychological processes. One must note that the automatic movement of images is just as much organic as it is mechanical in nature, and it also quite effectively blurs the distinctions between these two terms in its operations.

To situate cinema within the larger conceptual frameworks of modernity, it was in the nineteenth century that the categories of organic and technological – or the living and the non-living – were increasingly destabilized. This occurred for example, in the discourse of thermodynamics that connected hitherto separate phenomena in terms of parallel systems for the conservation, transformation, and deployment of energy.[1] Discussing the notion of energy involved in film aesthetics, Janet Harbord argues that "film as a medium is sensitive to the flow of energy, implicit in its characteristic tooling of rhythms, repetitions and cuts in a circuit of meaning."[2] Harbord notes that this becomes a question of how cinema plots the affective and embodied dimensions of experience, creating various pulls, degrees of freedom and constraint that shape how a body moves. Thus, cinematic energy can be seen in terms of the corporeal intensities and dynamics of action in the relationship between the viewer and the screen.

In this chapter, we shall conceptualize the moving image's energetic rhythms in instigating affectivity and embodied meaning, beginning with a genealogical approach to the problematic. As for late nineteenth-century discourses on how our bodily dynamics changes in relation to technological developments, one can point out the German philosopher Ernst Kapp's book *Grundlinien einer Philosophie der Technik* from 1877, which articulates one of the first modern views of technology. Kapp's view focuses on the relationships between organic and technical beings from a materialist or even "territorial" viewpoint. He believed that technology essentially participates in the creation of both biological and cultural space-times, considering the modulation of the human corporeal apparatus as

fundamental to technology in this respect. The key concept here is "organ projection" (*Projection der Organe* / *Organprojection*) that signals the way in which our corporeal apparatus, the inside, becomes exteriorized in technical objects ranging from the most elementary hammers to modern steam engines. Kapp postulates that these operate as unconscious projections of the sensorimotor apparatus, and it is through various kinds of technological extensions and augmentations of gestures and organs that human beings constantly model, replicate and recreate themselves in the course of evolution. For example, Kapp considers the eye to be an organ modulated through its projections in the *camera obscura*, whereas the nervous system is recreated through its projections in the electro-magnetic telegraph.[3] Technology thus does not appear to be reduced to its utility value; it does not play a mere instrumental role in human actions. Instead, Kapp approaches technology as a fundamental functional element in both the biological and cultural evolution of *homo sapiens*.

This theory has as its starting point the Greek word *organon*, which means both a part of the body and a tool.[4] For Kapp, the member and the tool are nonetheless articulated with each other in a hierarchical relation: the body is a model (*Vorbild*) of which the tool is a copy, an imitation or a reproduction (*Nachbild*). The primal model that in a sense determines both is the hand. In its composition and movements, the hand provides the organic "Ur-form" that the first instruments have been based on. The hand is the technical gesture *par excellence*, and it is primarily through the manual gesture – and not in language, for example – that the inside (form or model) is projected onto the outside (matter).

In this respect, however, there is an inherent ambiguity in Kapp's understanding of organ projection and, more generally, of the mutual connections and simultaneous separations between what is human and what is technological. This concerns how in Kapp's theory the "human" becomes adjusted to an internal and intimate, even essential relationship with technological objects.[5] Organ projection seems to imply its own inversion in the sense that what is projected as an outside – the technological object – gets confused with the very inside – the origin of projection – which is the body. According to Kapp, the technological copy reproduces not only the form of the sensorimotor apparatus (the model) but also its functions and even its substance. Thus, organ projection becomes conceptualized as a practice in which technology becomes intrinsic of the living organism and an essential feature that determines the species-being.[6] Obviously, Kapp's hylomorphic starting point is reversed. Instead of being a mere copy, technology modulates – it provides neither a means to an external end nor an end in itself but, rather, a pure means on which the human seems to depend by its essence, that is, a means without which the animal called *homo sapiens* would not be thinkable in modernity.

The notion of organ projection thus implicitly deconstructs the self-identity of the human, which becomes by nature dependent upon its technological modulations and is constantly transforming in relation to these modulations. One could, in fact, even speak of a technological environment within which the human becomes embedded and shaped. To note, in passing, that it was in the time of Kapp that the notion of ecology (*Oekologie*) was formulated by the German scientist Ernst Haeckel, who focused on organisms in terms of being embedded in their organic and inorganic environments.[7] In a similar vein, Kapp's theory suggests a form of ecology of technologies with regard to the human animal. Blurring distinctions between the inside and the outside, the concept of organ projection postulates a veritable feedback system between the living and the technological, similar to that of the one that exists between living organisms and their surroundings.

To articulate this system further, we can take up Gilles Deleuze's understanding of the organism as something that is fundamentally embedded by its constitution in its surroundings. Employing a terminology that interestingly echoes Kapp, Deleuze sees the process whereby the organism becomes individuated in its milieu as based on the interplay between the selection of an inside and the projection of an outside – "individuation" refers here to psycho-physiological differentiation, that is, the emergence of psycho-physiological unity from more or less undifferentiated elements. He underscores that the inside and the outside or the organism's interior and exterior, are only relative terms and are defined in the process of individuation. In Deleuze's words, "The interior is only a selected exterior, and the exterior, a projected interior."[8] Regarding technological ecologies, we can, by following Kapp again in this respect, also say that the living being equals a selected technological being, whereas the technological being turns into a projected living being. Approached in this manner, the concept of organ projection can be seen implying how the human being is essentially embedded in and gets individuated in relation to the technological milieu: the organism's interior is transformed and mutates in connection with its technological surroundings. Symptomatic of our biopolitical modernity, organ projection reflects technology's emergence as a kind of quasi-natural environment, one in which the living being is set in immanent connections with technological beings so that hierarchical separations between the two become obsolete.[9]

Kapp's theory is perhaps one of the first in which technological objects are considered in environmental terms and given a fundamental role in ontogenesis. Similar conceptions concerning individuation and milieu emerged at the turn of the twentieth century, not only in relation to technological phenomena but within the philosophy of art and aesthetics as well. Nietzsche's aesthetics of "organic functions," which was mentioned in the previous chapter, considers artistic creations as generating new modes of corporeality and living in bare

physiological terms. When discussing the affective nature of art, Nietzsche refers to the process of "transfiguration" that "produces new substances, pigments, colors and forms: especially new moments, new rhythms, new calls and seductions," in animals and adding that "with man it's no different."[10] As the reference to animal worlds suggests, transfiguration in this case does not represent miraculous changes in appearance but the living being's development and transformation with respect to its surroundings, implying a sort of ecology of aesthetic phenomena.

Vernon Lee (pseudonym for Violet Paget) and Clementina Anstruther-Thomson's article "Beauty and Ugliness" from 1897 represents another example of a contribution to the philosophy of art that proclaims a reconfiguration of aesthetics within the psycho-physiological continuum.[11] Lee and Anstruther-Thomson thought that aesthetic perception and emotions are not concerned with synthetic judgments but are "as important to animal life as those of equilibrium and respiration."[12] They approach art in terms of bodily dynamics and "vitalizing" affects – as forces, patterns and movements that directly solicit and modulate the rhythms of breathing and heartbeat, kinesthetic sense of equilibrium and motor activity, ocular micro-movements, and sensations of pressure, for example. Their treatment of image-based arts as intensely dynamic affective surfaces is especially interesting. The authors note how colors influence respiration so that in aesthetic experience "we seem *to inhale colour*," obviously implying that the image functions as a milieu.[13] The dimensions of the image (e.g., height/depth, breadth, distance) also become an issue of breathing tensions. Modulations of form with lines, on the other hand, turn into sensorimotor experiences and fast and slow rhythms: "[W]e follow lines by muscular adjustments more considerable than those of the eye, and … these muscular adjustments result in a sense of direction and velocity in ourselves and a consequent attribution of direction and velocity to the lines thus perceived."[14] As such, Lee and Anstruther-Thomson note, perception is "intimately and automatically connected with movement."[15] A picture becomes a kind of kinesthetic organ projection, as in looking we "unconsciously *mime* the subtly subordinated complexity of movement" in and of images.[16]

Thus, at the turn of the twentieth century a model of both technology and visual arts arose that regarded these domains in terms of psycho-physiological processes and milieus that significantly reconfigured us as living beings – a model that can be characterized as "cinematic" in its emphasis on kinetic relations of velocity and affective binding. A conception of visuality emerges that withdraws from the optical toward the notion of the image, which is composed of material intensities and forces of individuation, and may even generate a specific ecology of its own. This is an important point regarding what anticipates and accompanies the emergence of cinema and the experiential arrangements it

entailed. For example, Edwin S. Porter's Uncle Josh at the Moving Picture Show (Edison Manufacturing Company, 1902), which is a remake of Robert W. Paul's The Countryman and the Cinematograph (1901), is one of the first "meta-films" that deals with the cinematic experience. The film opens with Uncle Josh viewing (alone) "The Edison Projecting Kinetoscope" program. Josh is in a vaudeville theatre box in front of the projection screen, as the first part of a series of three films begins – the films are clips taken from earlier Edison movies that incorporate conventional "genres" of early cinema such as a dance film, a scenic view with a train, and physical comedy. The first film, Parisian Dancer, shows a woman who starts to dance, and at the very same moment Josh jumps out of the box to the front of the screen and begins to clumsily dance along. Then there is a short pause and another film begins, The Black Diamond Express, showing a train approaching the camera, to which Josh reacts in a panic as he leaps back into the box at his left to find cover. Here the screen is displayed as a techno-aesthetic milieu of Josh's impulsive behavior, the modulations of form, movement and forces on the screen directly coupling with Josh's bodily rhythms and sensorimotor experience. Josh's movements appear as immanent with the velocities and lines of the image, and the individual gets defined in relation to the rhythms of the screen. Thus Uncle Josh shows how cinema technology and the cinematographic image become sites of inverted organ projection: the cinema is seen as a process whereby our relative inside is selected from the screen (the outside) and our relative outside is projected by the machine (the inside). In this process, the individual gets shaped relating to the differential rhythms by which it connects to its techno-aesthetic surroundings as well as to the affects by which it "contemplates" its world.

Automatism

From another viewpoint, the emergence of this new kind of organism-machine assemblage in cinematic organ projection becomes reflected in Pierre Janet's notion of psychological dissociation, a notion that pertains to the phenomena of mental fatigue and disintegration related to personal perceptions and memory and is connected with what Janet calls psychasthenia.[17] Janet was an important figure in the development of dynamic psychology at the turn of the twentieth century, but his influence in that field was subsequently foreshadowed by the dominance of Freudian psychoanalysis. In *L'Automatisme psychologique*, first published in 1889, Janet distinguishes between two ways of experiencing a phenomenon. On the one hand, personal perception indicates "normal" mental activity in which a complex of sensations and perceptions

– "images" in Janet's words – is synthesized into a larger coherent whole that the subject is capable of expressing in articulate language.[18] This especially signifies voluntary attention understood as a personal power and psychic energy or force that forms syntheses and produces new perceptions from what Janet, on the one hand, terms the field of consciousness, that is, "the greatest number of simple or relatively simple phenomena that can be at once presented in a consciousness."[19] On the other hand, impersonal sensations occur on another level of consciousness, and Janet believes that they characterize the mental state of hysterical and neuropathological subjects. This kind of mental activity indicates an impaired capacity of active synthesis and is explained by Janet with two mutually implicating notions of psychological disintegration (*désagrégation psychologique*) and the narrowing of the field of consciousness (*rétrécissement du champ de la conscience*).[20] Both notions point to what Janet terms psychological automatisms, which he defines in terms of "a purely affective life of mere sensations, phenomena which are conscious but not attributed to personality."[21] Janet considers automatisms – automatic, habitual associations of ideas – resulting from (mental) weakness and weariness, which inhibit voluntary attention. The narrowing of the field of consciousness as experienced by hysterics and neuropaths is due to a weakness of psychic synthesis that hinders the uniting of the large quantity of sensations passing through the body in a single personal perception. Voluntary, attentive activity is replaced by automatic behavior.

Janet's views on dissociation include experiments with hypnosis as their point of departure. These experiments disclose sensations that are not part of a personal perception but nevertheless become sensed and the existence of multiple nuclei of consciousness within the individual.[22] In this respect, Janet conceives of psychological automatisms not in purely mechanical terms but as phenomena that also include a mode of awareness. He approached this kind of "rudimentary" or "nascent" consciousness most basically in terms of sensorimotor dynamics.[23] Sensation (including exteroceptive and proprioceptive sensations), according to Janet, immanently instigates a tendency for action in the organism, and the automatisms here play a regulatory role with respect to the movement executed. Crucially, these automatisms operate on an affective level prior to cognitive mediation, whence, as Janet proclaims, "movement can be produced directly by visual or auditory images" ("image" here signifying sensorimotor relations rather than representation).[24]

To continue our discussion of Uncle Josh at the Moving Picture Show, it is precisely this kind of process of dissociation and the emergence of impersonal sensorimotor automatisms that the film highlights regarding the cinematic experience. The problem concerning individuation that Uncle Josh is concerned with in the context of cinema clearly replicated the one confronted in the experi-

ments with hypnosis with respect to how individuals can experience sensations and also produce actions that do not belong to their own personal phenomenal worlds. Josh's sensations and movements are not his own in terms of being part of a personal judgment but rather embody a kind of affective "dancing along" with the moving image. Josh's sensations and movements, in other words, belong to the cinematographic machine inside him. The film thus suggests that the cinema immanently triggers impersonal affective and motor phenomena, like the ones described by Janet in terms of automatisms. Within this intensive realm of experience, there are no clear-cut separations between the individual and the moving image. Janet describes the sensations that accompany the sensorimotor automatisms as "absorbing," referring to how, at this level, it is impossible to experience sensations as one's own because distinctions between inside and outside have been erased.

The concepts of automatism and dissociation thus describe the process of organ projection that is taking place in the cinema in terms of moving and dancing along with the image. To add another conceptual dimension, Roger Caillois has called morphological mimicry a similar kind of psychogenetic process, which Janet covers with his notion of automatism. This concept derives from Caillois's observations of the life of insects.[25] In the mimetic behavior of certain insect species, which consists of morphologically as well as chromatically simulating a leaf, for example, Caillois writes, "[t]he search for the similar would seem to be a means, if not an intermediate stage. Indeed, the end would appear to be *assimilation to the surroundings*."[26] Caillois characterizes this phenomenon as "a real *temptation by space*" which is related to the operation of corporeal automatisms and disturbances in the perception of space. As for the latter, they concern the space in which the organism lives, the milieu. The living being loses its status as the origin of spatial coordinates – one could also say, as the origin of projection – and becomes merely one point among others, an *any point whatever* in space; the organism "*no longer knows where to place itself*." In this way, the organism becomes dispossessed of personality, which Caillois, like the Bergsonian "my body," understands as the feeling of distinction from one's surroundings based on the connection between consciousness and a distinct point in space. Caillois further approaches this perceptual and personal disintegration with Janet's notion of psychasthenia and the "depersonalization by assimilation to space" that it describes. At the impersonal level of intense affections, space functions as a force that devours and even replaces the subject: "*I know where I am, but I do not feel as though I'm at the spot where I find myself*."[27]

It is precisely this kind of intensive spatiality and corporeal submission to the dynamics of the image that Uncle Josh highlights. The third film in the series of the "picture show," The Country Couple, shows a man approaching a woman with explicitly sexual motives. When seeing this, Josh loses control, attacks

the man and tears down the screen. While he is unable to separate the theater space from the screen space, Josh physically transgresses their boundaries and ends up destroying the latter. The film thus displays the cinematic experience as a kind of assimilation based on a process of depersonalization: the screen is an intensive field that, at the level of impulsive, affective automatisms, cannot be separated from Josh's existential world. Yet one must note that, at the same time, Uncle Josh evidently also negotiates a sense of demarcation between the body and the screen. As Miriam Hansen argues, by narrating the cinema's powers as a medium and presenting a comic allegory of spectatorship, the film articulates a relative difference between spectator and cinema and thus emphasizes our distance and eventual exclusion from the events taking place on the screen.[28] Furthermore, Thomas Elsaesser suggests that Uncle Josh can even be seen as an act of self-censorship and self-restraint on its viewers, who laugh at the rube's mistakes. While distinguishing themselves from the silly character of Uncle Josh, the spectators are urged to internalize a mode of self-control with regard to their own behavior and actions in the viewing process.[29]

However, as Uncle Josh outlines, the fundamental mode of assimilation prevails at the heart of embodiment in cinema in general and the early cinema of attractions in particular. Take for example James Williamson's The Big Swallow (1901): the film shows a man who approaches the camera and eventually swallows it, which causes a serious disintegration of our spatial coordination. The one-minute film begins with a three-quarter shot that shows a "gentleman" with a cane, gesticulating and, according to the catalogue summary of the film, yelling angrily "I won't! I won't! I'll eat the camera first."[30] Step by step, the man moves closer and closer to the camera and the shot ends with an extreme close-up of the man's lips and mouth and, momentarily, with a black screen (figs. 5 and 6). In this shot, a gradual dislocation of fixed spatial points of reference takes place with the change from three-quarter framing to an extreme close-up. What is dislocated here is the "my body" that articulates a separation between "here" and "there," and incorporates the border between the inside and the outside, the sensing subject and the image moving on the silver screen. Through the extreme close-up and the black screen in which spatial points of reference have vanished, the shot modulates an impersonal or "depersonalizing" affect of being devoured and even replaced by the cinematic space. These disorientations between the body and the image, however, are partly balanced and nonetheless simultaneously intensified with the next shot that is actually comprised of a rather crude trick. The mouth is matched with a black canvas occupying the frame, into which the camera and its operator get sucked (near medium close-up). As it re-establishes a distance between the camera's viewpoint and the mouth, body and image, this shot, on the one hand, saves us from complete assimilation. On the other hand, it also leaves us perplexed about the spatial

proportions and scale with regard to what was established in the beginning of the previous shot. Space in The Big Swallow is discontinuous while directions are fragmented. These disproportions are augmented in the final shot, which is a reversal of the first: the man, munching and grinning, retreats from the camera (an extreme close-up to a close-up) with the main change from the beginning being that he now looks straight into the camera. By the last shot, we are lost somewhere between the inside of his mouth (image) and its relative outside ("my body").

Figure 5 Still from The Big Swallow, *by James Williamson (1901)*

The trick of The Big Swallow is not simply "on the keyboard of our minds," as Hugo Münsterberg observed, but, more pointedly, on the keyboard of our affective life. The film is based on a disparity and yet an intimate connection inherent in cinematic organ projection, between the body of the viewer and the image projected. The Big Swallow plays explicitly on this intimacy. The projection of a relative outside and, consequently, the selection of a relative inside now arrive, not from the inside but from the outside itself, because the origin of projection and its point of reference in space become ambiguous. The outside environment

seems to transform into and determine the inside of the body and consciousness, and the latter lose their coordinates and turn into any points whatsoever in the cinematic space where "here" and "there" have become confused. There is a neuromimetic assimilation between the body and the screen, an assimilation in which these two appear as one and the same. Thus, cinematic experience clearly resembles those insect-like dimensions described by Caillois in which "the body separates itself from thought, the individual breaks the boundary of his skin and occupies the other side of his senses... He feels himself becoming space, *dark space where things cannot be put*."[31]

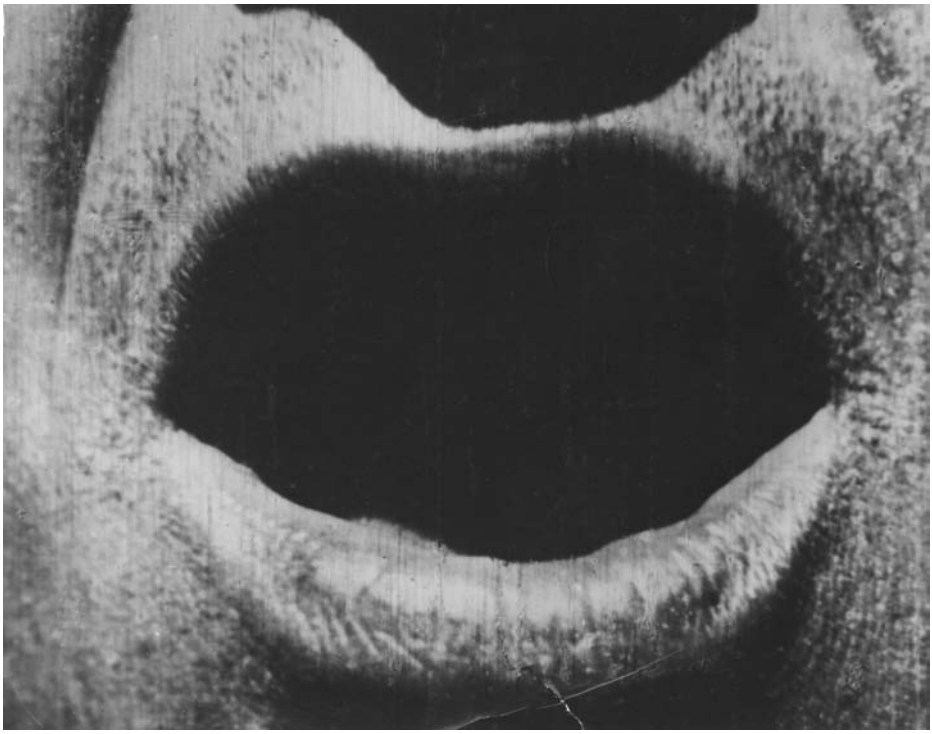

Figure 6 Still from The Big Swallow

The opening shot of The Big Swallow thus functions as an inversion of the generation of space and the sense of location involved in the processes of individuation and the psychogenesis of life. Extensive space with the "my body" as its center, accompanied by distinctions between figure and ground, distances, directions and scale, gradually dissolves into an intensive "spatium" or an abyss populated by intensities and affections such as nascent shapes, movement vectors, rhythms, the dynamics of speed and slowness, and elementary tempo-

ral patterns. In this way, the film suggests how coordinated hierarchies of extensity are substituted for dynamic relations of speed and slowness in cinema, and how perception is caught in vectors of movement and force-lines. The result is a technologically generated "ahuman" perception that is multiple, constantly changing and becoming other. Cinema generates a devouring space basically composed of blocks of space-time with different velocities and heterogeneously distributed directions of movement. This intensive space defies mastering in terms of (symbolic) representation and even requires that the living assimilate via a special kind of neuromimesis, first, kinetically in terms of relations of speed and, secondly, dynamically in terms of capacities to affect and to be affected.

This kind of neuromimetic coupling of the organism and the image is based not on forms represented by a spontaneous agent but on a certain repetitive process of the habitual binding of excitations. Janet stresses the role of habit in the formation and development of automatisms. Moreover, following the empiricist tradition that began with David Hume, Deleuze points out the importance of habit and especially repetition to organic life and individuation.[32] He defines habit in terms of contraction. Simply put, there is a repetition of an objective sequence of elements: AB, AB, AB, A... The organism, for example, the nervous system, retains one element (A) when the other (B) appears, and an internal impression is formed, as Deleuze noted, "like a sensitive plate." This is the operation of contraction: given the impression arising from the repetition of elements, the organism expects B when A arrives, and so on. In this way, contraction gives rise to a particular mode of temporality, that is, the lived present, which has the past and the future as its relative dimensions. The past is the preceding instant retained in the contraction and the future is that which is anticipated in this contraction. Habit, then, is constitutive of our living in the present. Of course, this habitual life involves some kind of synthesis of elements. This synthesis, however, is not active by nature. According to Deleuze, it "is not carried out by the mind, but occurs *in* the mind which contemplates, prior to all memory and all reflection."[33] It is passive because it is sub-representational and does not involve agency ("I"). This synthesis characterizes an affected and affective self prior to separations between the inside and the outside, ones that were pointed out by Janet in terms of psychological automatisms.

Cinema is a technology that immanently modulates this operation of contraction through its repetitive rhythms. It is a technology of the lived present. Most basically, the repetition of instants in cinema (e.g., 1/16 of a second) is not consciously reflected but rather lived through in pure perception and then passively synthesized into elementary sensations and movements – sensations that are not represented or "perceived" and movements that are not performed by a conscious agency and thus have no end. For example, this situation is explicit in

Émile Cohl's Mobilier fidèle (The Automatic Moving Company, 1910). The trick film presents, as its English title somewhat implies, furniture moving automatically in the sense that it lacks human or other kinds of motive agency. Inert objects are animated and are transferred by themselves. In the opening scene, a postman drops a letter in a mailbox; the letter floats onto a nearby desk, a knife opens the envelope, and "someone" reads the assignment. In the second scene, a wagon (without horses) travels to a house; the doors of the wagon open and pieces of furniture – chairs, cupboards, beds, tables – jump out, enter the building, and climb the stairs to an apartment; there, the objects arrange themselves neatly and in order. The entire film is based on this single trick. As for the trick, the question evidently concerns the lack of an agent or cause. The film confuses cause and effect, the subject and the object, and presents causes in effects or "immanations." There is neither a clear-cut separation between the agent and the patient nor the inside and the outside. In this way, the movement of things in the film crystallizes the function of cinema: there is no mind that needs to add movement to an image in cinema, the moving image being the effect of itself. Furthermore, in its mode of embodiment, cinematic experience is based on the material repetition of things that become synthesized in the affective state. In this state, the movement of the image is not carried out by the mind but occurs *in* the mind, in the "larval stage" prior to any clear-cut division between the inside and the outside.[34] In fact, from the viewpoint of conscious representation, Mobilier fidèle would appear to be a-symbolic or a-signifying "nonsense." In other words, "living through" the film requires affective binding based on habit and consequent neuromimetic assimilation. Instead of symbolic patterns, the film puts into play the affective life of elementary sensations and movements generated by passive syntheses of material repetition. It is precisely at this level of passive syntheses that the cinema originally captures the living being. Cinema, for its part, modulates "the thousands of passive syntheses of which we are organically composed."[35]

Habitual contraction, then, characterizes cinematic embodiment. It is the force that binds us to the screen. In this respect, it is the passive synthesis of (audio)visual elements that creates the moving image experience. Cinema, in other words, is based on a certain kind of "attraction" of the image. Etymologically, the term "attraction" comes from the Latin *attractio*, which means contraction and drawing together, and it suggests, as the first definition of the word in *Oxford English Dictionary* indicates, an "action of drawing or sucking in." In a sense, then, to follow a concept employed by both Tom Gunning and André Gaudreault (who borrowed it from Sergei Eisenstein), every film presents a "cinema of attraction(s)." Generally speaking, attraction can be considered in terms of a mode of filmic experience, which directly solicits the spectator and *attracts* her/him toward the screen. As Wanda Strauven notes, it is a concept that

emphasizes the force of the image upon the individual, even in elementary physical as well as physiological senses.[36] Attraction points to a force that literally draws and sucks inward like the milieu in which living bodies breathe, move and support the living. Cinema thus modulates our living presences and habits, the affective life of the organism.

Vitality Affects

The argument put forward thus far nonetheless demands a more nuanced understanding of what we mean by affect in this context. While the concept of affect has been a subject of lively discussion and analysis in recent film and media studies and cultural theory, the following treatment is mainly restricted to findings in contemporary developmental psychology and film theory.[37] Let us first take a look at how one early film theorist describes the experience of cinema. In his essay "On Certain Characteristics of *Photogénie*" ("*De quelques conditions de la photogénie*") originally published in 1924, Epstein, while he was developing the notion of *photogénie*, described the close-up (a technique, Epstein noted, that was experimented on extensively in early cinema):

> [A] close-up of a revolver is no longer a revolver, it is the revolver-character, in other words, the impulse toward, or remorse for crime, failure, suicide. It is as dark as the temptations of the night, bright as the gleam of gold lusted after, taciturn as passion, squat; brutal, heavy, cold, wary, menacing.[38]

Epstein here explores how the power of filmic expression is going to shape our experience of objects and the world at large. The most interesting aspect of Epstein's description is the way in which he aligns the close-up with immediate and immanent impulses (*désir* in the original) and passions, with emergent feelings of colors and sensations of magnitude and quality (heavy, cold, squat) as well as with certain affective states (brutal, menacing, taciturn). The moving image, Epstein seems to imply, creates an entire web of sensual embodiment that attracts or attunes us into its affective modes within a single shot and moving frame. Epstein's description of the close-up points primarily to elusive, intensive and dynamic qualities of experience such as the explosion or surging of an impulse or a feeling, the variation and play of light and shadow, or the "squatness" of the image. Furthermore, when discussing the nervous energy that links the screen to the spectator, Epstein associates the close-up with the disappearance of physical distance and the production of intimacy in amodal perception: "The close-up modifies the drama by the impact of proximity. Pain is within reach. If I stretch out my arm I touch you, and that is intimacy. I can count the

eyelashes of this suffering. I would be able to taste the tears."[39] One must note, in passing, that also Münsterberg pointed out how "neurasthenic persons" in particular are susceptible to "experience touch or temperature or smell or sound impressions from what they see on the screen."[40]

In *Cinema 1*, Deleuze takes his cue from Epstein in developing his concept of affection in cinema.[41] To put it briefly and bluntly, Deleuze believes that the function of what he calls the "affection-image," which is emblematized by the close-up again, is to express qualities of things, and the mode of perception it brings forth does not pertain so much to particular sights or recognizable objects as it does to emergent shapes, rhythms, intensities and passages abstracted from their spatiotemporal coordinates. The affection-image in this sense incorporates an experience of *thatness* before showing precisely *what* happens and then discloses a dimension of the passive synthesis that was mentioned earlier, which concerns the sensation of material movements before representations take place. One should point out that these kinds of affective experiences do not totally conform to the categories of emotion introduced and analyzed by Charles Darwin in *The Expression of the Emotions in Man and Animals* (1872) – for example, happiness, sadness, fear, anger, disgust, and surprise, which are each accompanied by a proper facial expression. Instead of the perception or communication of form, the affect in cinema refers instead to the experience of bodily intensity and force. Deleuze takes his notion of affection-image mainly from Bergson, who defines affectivity in terms of the body's intensive interiority.[42] Affectivity is the action of the body on itself, which takes place within the sensory dynamics internal to the body. As Epstein's description of "reaching pain" and "tasting tears" on the screen suggests, the cinematic image encompasses forces internal to the body in addition to external perception, and it is precisely these forces that the medium takes hold of in organ projection.

In this respect, cinematic embodiment can be further described in terms of what Daniel Stern has called "vitality affects."[43] These are characterized in dynamic and kinetic terms such as *surging*, *fading away*, *fleeting*, *explosive*, *accelerating*, *decelerating*, *bursting*, *reaching*, and *hesitating*. They concern the force, intensity, quality, form, or rhythm of experience, and accompany even most of the elementary daily events like breathing, moving, sucking, defecating, and swallowing. Stern notes that "[v]itality affects are subjective experiences. They consist of the temporal dynamics of changes in feelings consisting of analogical shifts, split second by split second in real time, of affects, thoughts, perceptions, or sensations. For instance, the felt acceleration and then explosion of anger."[44] Vitality affects, as their name already tells us, form an important part in the psychogenesis of life, since they incorporate elementary stages toward personal unification and play a crucial role in vital processes of life such as breathing, getting hungry, or feeling the coming and going of emotions and thoughts.

They, in other words, make up the fabric of individuation. Crucially, Stern also associates these experiences with amodal perceptions, which form a matrix for the emergence of vitality affects. Amodal perceptions concern global perceptual qualities that are held common by all of the modalities of perception such as intensity, shape, time, motion, and number. "[A] rhythm," Stern writes, "such as 'long short' (— –), can be delivered in or abstracted from sight, audition, smell, touch, or taste."[45]

We can also speak of the vitality affects of cinema, pointing out how the moving image consists of breathing rhythms, intensities of affective states, and form and texture dynamics, among other things.[46] From the outset, cinema emerged as an embodiment of such a mode of experience. In a contemporary description of the Lumière Exhibition in Sweden in 1896, one commentator pointed out that while witnessing "the workers streaming out of a factory" he noticed how "every little movement, every twitch of a muscle stands out so clearly that we seem to see the picture in real life."[47] While this description revealed a common and cross-cultural fascination among the early writers on cinema with the "lifelikeness" of the shadows projected on the silver screen and the vividness of emotions produced by changing figures and settings, what is notable in it is how it pointed to the micro-temporal dynamics of cinematic embodiment. The cinema, the author tells us, is about movement and twitching, implying that the moving image captured the micro-temporal dynamics of experience that concerns perceptions of the intensity of a smile, the twitch of a muscle, or the rapidity and rhythm of hand movements, for example. What the commentator describes as the image's lifelikeness is due to cinema's capacity to capture affects that manifest the body's vitality, transposing them onto the screen irrespective of the particular bodies to which they belong. As Brian Massumi describes it, "Affect is autonomous to the degree to which it escapes confinement in the particular body whose vitality … it is."[48] A similar perception that directly concerns the body's sensation of its intensive interiority in an external image can be found in Béla Balázs's 1920s theory of the close-up. Wrinkles and muscle twitches, Balázs wrote, participate in a temporal dynamics of changing feelings, and he referred to Asta Nielsen's case in particular in which "[w]e see every hint of expression around her eyes and mouth and watch them relax one by one and slowly change. For minutes on end we witness the organic *development of her feelings*, and nothing beyond."[49] Balázs's description directs our attention to the surface of the image as the interplay of affective charges triggering the swell of emotions. The image turns into a kind of dynamic experience especially in the close-up that produces breaks and gaps in the links between images subjected to narrative and/or spatiotemporal continuity, generating particularly emotionally colored tensions and rhythms.

This suggests that the so-called lifelikeness and emotional force at issue here is not so much about what films show but more about the movement and twitching of the cinematographic image itself. As known, one of the main attractions in the Lumière Exhibition were the transition of the still image into a moving one. For the first time in the history of visual culture microscopic variations, which our fabric of reality is made up of, were also subjected to constant animation and modulation. This holds true even of the earliest films such as Sortie d'usine (Workers Leaving the Lumière Factory, 1895) that, as Gaudreault has analyzed, already consisted of dynamic fragmentations and segmentations.[50] The sequences of their constituent frames were "noncontinuous" in their organization, and were affected by breaks and disproportion. Consequently, the intensive surface of the moving image comes into focus, and then suddenly jumps, embodying the twitching of nerves and muscles, saccadic rhythms of figures as well as changes in the positions and trajectories of figures directly influencing the intensities of our visual field and bodily experience.

This bodily dynamic bears on what Stern calls "temporal contours" of experience. These are "objectifiable events" and correlate with the emergence of vitality affects. Temporal contours consist "of the analogical shifts … in the intensity, rhythm, or form of the stimulation [of the nervous system]."[51] Crucially, Stern argues that it is also from these rapidly changing and varying contours, accompanied by specific affects that our subjective *now*, the lived present, or what he calls the "present moment," generates. This is the time, Stern observes, that is "needed to make meaningful groupings of most perceptual stimuli emanating from people, to compose functional units of behavioral performances, and to permit consciousness to arise."[52] Stern says that the present moment lasts between one and ten seconds, with an average duration of circa three to four seconds. But he also keeps its quantitative definition open, the main point being that "one coherent continuous event fills the entire duration of a present moment."[53] It is from these moments that our sense of self and agency – and also the differentiation from our surroundings – emerges. Present moments establish existential coherence in both personal and intersubjective terms.

With rapid movements on the surface of the image, shifts in rhythms with cuts or montage within the frame itself, cinema composes temporal contours that shape diverse sorts of affective modes. But Stern's concept of vitality affects opens up a perspective on the moving image we have not considered so far, that is, the creation of meaningful spheres of action and feeling in cinematic embodiment. The question is how continuous present moments emerge and get modulated in cinema. Raymond Bellour suggests that we can establish a correspondence between the present moment and the shot in analytical terms.[54] The shot, he argues, forms a unitary block of duration comparable to the present moment, one that is indefinite and internally divisible into actions and rhythms, which

contribute, in a micro-temporal dimension, to the emergence of an event with a unique sense. A similar understanding of the shot in fact arises in Deleuze, who defines it as a unity of movement/duration that "embraces a correlative multiplicity which does not contradict it."[55] Of course, shots with variable durations do not easily conform to the time limits of the present moment provided by Stern, and Bellour refrains from making a literal connection between the two analytic terms. Instead, he suggests that numerous modalities of variation within the shot itself may also count as present moments in cinema, incorporating shifts in thoughts, feelings, action, stance, and bodily dynamics. The point is that the concept of present moment permits us to separate and crystallize in detail those sensible durations within or between shots that participate in putting up the polyphonic constellation that is the meaningful world of a film. In other words, it permits us to point out those "multiplicities" of micro-temporal rhythms, variations and actions created in cinematic expression that constitute processes of individuation resulting in psycho-physiological unity in the cinema.

From this perspective, let us now look at Edwin Porter's The Great Train Robbery (Edison Manufacturing Company, 1903) and analyze one particular shot from it. The film's storyline is straightforward: a bunch of bandits rob a train of the money transfers and the passengers' valuables. The robbers attempt to flee but are pursued by law enforcement officers and are eventually caught and killed in an exchange of gunfire. Critical analyses of this film have often concentrated on the narrative editing and the technique of crosscutting it utilizes.[56] Instead of taking up these issues, we shall here merely analyze the implications of the film regarding our understanding of affective experience and the role of present moments in cinema, focusing on the film's third scene. This is a continuous shot that shows the inside of an express car where the money is being guarded by a messenger. Let us look at the moments or durations that create this scene, which lasts roughly 60 seconds in total:

- The scene begins with an establishing view with a matte shot: in the background we see the landscape rushing past in a blur through an open side door, while in the foreground we see an empty floor. There is one coffer open on the floor on the other side of the interior and others piled up against the wall. The messenger is busy with the baggage (c. 13 seconds).
- Suddenly, the messenger gesticulates as if he hears something; he runs to the closed door on the left of the car and peeks out of the keyhole. Then he rushes back to the coffer on the floor to lock it (c. 7 seconds).
- Two bandits break the door down (with pieces falling to the floor), while the messenger locks the coffer and throws the keys out the open train car door. He pulls out his gun and takes cover behind the pile of coffers (c. 3 seconds).

– The bandits break the door down on the left and gunshots are exchanged, with smoke from the weapons filling the air. The messenger gets shot and falls down on the floor (fig. 7) (c. 4 seconds).
– Two diverging lines of action now emerge (c. 22 seconds). One of the bandits tries to open the coffer, searches for the keys to the lock, and finally sets up an explosive. Meanwhile, the other bandit guards the door they broke down, gesticulating and moving around nervously. The alternating shifts or "cuts" in affects and rhythms between the two men can be seen as constituting two or more separate present moments here.
– After setting up the explosive, the bandits run for cover outside the picture frame, and the coffer explodes (fig. 8) (c. 4 seconds).
– They come back, collect what they were after, and depart (c. 7 seconds).

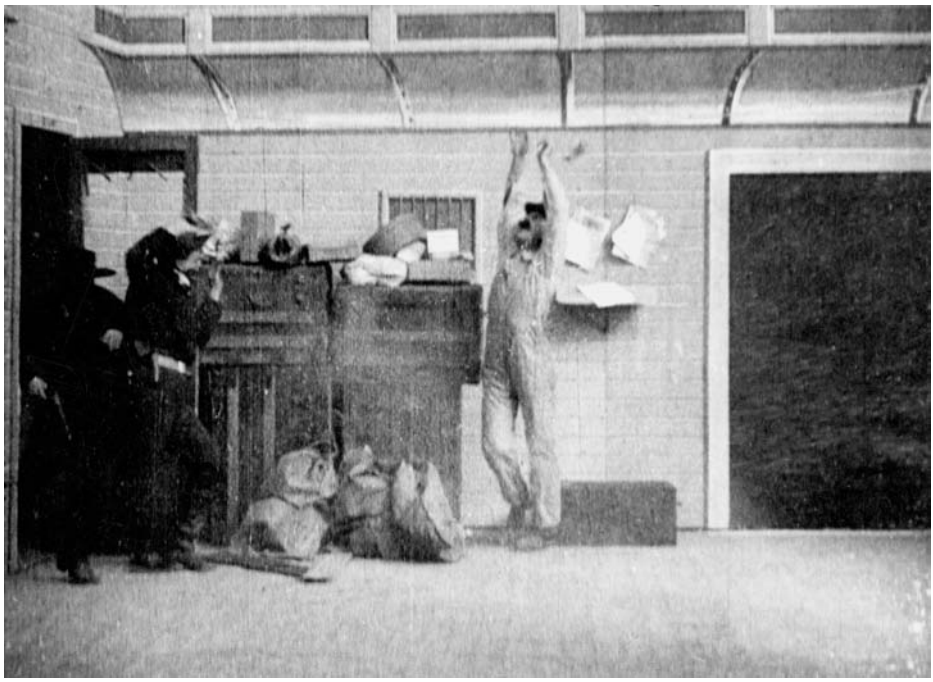

Figure 7 Still from The Great Train Robbery, *by Edwin S. Porter (Edison Manufacturing Company, 1903)*

The establishing view is based on a perceptual disorientation comparable to the one we have seen in the previous chapter in A Storm at Sea. With the train moving parallel to the screen from left to right, the surfaces of our perceptual field and our kinesthetic sense of location are dislocated and identified with the moving train. The background merges with the moving projectile and its velo-

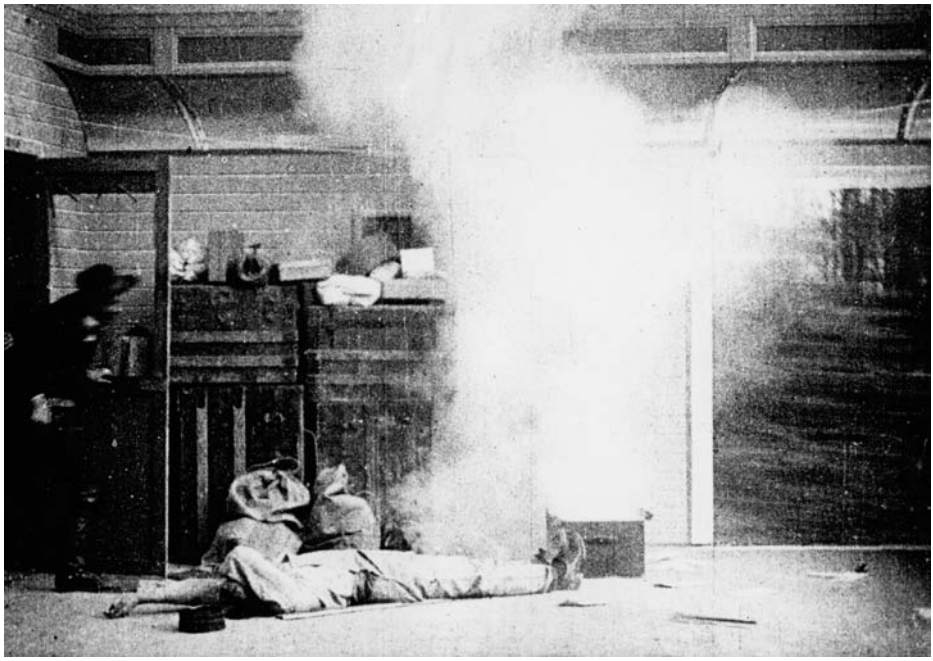

Figure 8 Still from The Great Train Robbery

city, which, as Jonathan Crary suggests, challenges the symbolic apprehension and solicits bodily density in experience.[57] The unfolding of the scene takes place through a rhythmic composition of diverse durations made up of various lines of forces, establishing, as Crary describes, a "kinesthetic constellation of moving forces" that is based on affective binding by which we are immediately sucked into the film's rhythms. This binding primarily yields a mode of proprioceptive bodily engagement, conveying a sense of weighed physical movement on the train. Several other kinds of affective modalities are also created, based on this kinesthetic experience generating from the mobility of the frame and background. These concern the visceral tensions emerging from the gun battle, the growing tension as the bandits wait for the coffer to explode that may increase the rhythm of breathing or the heartbeat, the burst of intensity as the coffer explodes, as well as the haptic quality of visual sensation when the smoke and notes from the coffer fill the air that makes us feel the tactile dynamic of the image surface in our bodies. Moreover, by analyzing the scene based on the various durations that alternate within the shot's internal montage, we see that the shot accelerates toward the middle, creating tensions of intensity and speed, which are focused on the gun battle and the explosion. All in all, the scene puts

up an affective space where the visual field becomes essentially translated into proprioceptive sensations of bodily intensity, rhythm, and speed.

But, what is important in this scene with respect to our previous examples is that, from within this affective space, actions and intentions also emerge. In other words, from within the vitality affects that the scene establishes – consisting of proprioception, haptic vision, and visceral sensations – meaningful units of behavioral performance arise that concern dramatic tensions, intentions and goal-directed actions in the unfolding of the film's story: the bandits break in order to steal the money, the messenger throws the key away to protect the contents of the coffer, and so on. These, however, should not be confused with symbolic patterns (the storyline as told and "past"). Rather, they are about the *process* of narrative development, which each present moment in the scene contributes to. Stern, in fact, considers intentions as the major elements of present moments and the pre-symbolic and pre-verbal narrative organization of experience, describing how "the present moment has the feeling of intentionality in movement."[58] He goes on to argue that the "intentional-feeling-flow" these moments incorporate forms an important aspect of our intersubjective relations and the understanding of the behavior of other people.[59]

The Great Train Robbery builds on this kind of an intentional-feeling-flow made of present moments, which, for their part, build on the micro-dynamic and affective – in the first instance proprioceptive – dimensions of experience. The kinesthetic sensation of being moved becomes aligned with purpose-oriented action, which embodies a correlation between the eye and the hand. The film thus creates a fundamental experience of sensorimotor power to feel affections and act, which forms the basis of personality and agency.[60] In the film, spatial relations are no longer primarily immersive and devouring but acquire a certain kind of operative unity, whereas objects become functional elements in actions – coffers offering cover, keys performing a significant role in the dramatic tension between the bandits and the messenger, for example. As Bergson explains, "[t]he objects which surround my body reflect its possible action upon them."[61] One could say that spatial relations and objects become parts of the intersubjective matrix that the film enacts in the flow of present moments. These moments then compose the story of the film as lived, which is not necessarily verbalized or symbolically represented. They, in other words, contribute to the experience of the film as meaningful – to our understanding of the actions and gestures of the messenger when the robbers break in and the bandits' objectives. Unlike our previous examples such as the earliest Lumière films where the event of the image becomes the focus, or The Big Swallow and Mobilier fidèle that trigger automatic, affective binding, The Great Train Robbery generates intersubjectivity based on the access to other people's experience and the awareness and understanding of their motives, desires, feelings, and thoughts.

Stern notes that intersubjectivity plays a significant role in psychogenesis when it comes to both social relations and self-identity and self-cohesion.[62] Furthermore, according to Stern, "All present moments involving intersubjective contact involve actions, be it a mutual gaze, a postural shift, a gesture, a facial expression, a respiratory change, or a change in vocal tone or strength."[63] In addition to the affective space, The Great Train Robbery also constructs an "action-space" around the continuity of spatiotemporal relations as well as on the intentions and behavior of the characters. Thus the film brings about a meaningful environment or "world" (in a phenomenological sense) where personal and intersubjective coherence emerges on the grounds of mutual actions and shared intentions and feelings. This is the world of meaningful behavior, action and communication that the cinema gives rise to.

The Open

As the case of The Great Train Robbery reveals, affects and automatisms also generate agency in cinema. Vivian Sobchack, with regard to this notion of agency, points out how the cinema gives rise to a "cinesthetic subject" that senses screen events affectively in the interior of its body. Sobchack posits that film experience involves a reciprocal relation between the viewer and the screen in which the field of the image momentarily becomes an intensified sensory experience within the viewer's own body. "The cinesthetic subject," she writes, "feels his or her literal body as only one side of an irreducible and dynamic relational structure of reversibility and reciprocity that has as its other side the figural objects of bodily provocation on the screen."[64] Sobchack thus describes the fundamental feeling of subjective cohesion, the feeling of "my body" and sensorimotor power, that takes place in cinema.

However, we must note that subjective cohesion emerges from the "larval" state of passive syntheses, which actually make the dynamic relational structure of reversibility that Sobchack introduces possible.[65] Every corporeal and psychodynamic gesture by which elements are synthesized into functional and meaningful wholes (e.g., keys becoming part of the scene's dramatic tension) is fundamentally based on passive syntheses, since the latter are what make up the individual itself. As Gilbert Simondon shows, the individual always exceeds itself in its constitution, as its existence supposes a reality that is "pre-" as well as "trans-individual."[66] We have analyzed this reality in cinema in terms of techno-aesthetic automatisms based on habit. These automatisms are what individuate us in a certain manner. Emotional and behavioral patterns, personal

memories and conscious representations in the cinema are a kind of second-order of automatisms that derive from habitual contractions.

Existential, subjectively embodied experiences in cinema, depend on and emerge from fields of pre-individual singularities. In this respect, a crucial analytic concept is that of the (technological) milieu, which stems from the ecological considerations brought up above. We have already implied how in our example, The Great Train Robbery, functionally inhabited milieus are generated in cinema. That happens when the sensorimotor circuit between the body and the moving image not only nervously contracts, jerks, immediately reacts, hallucinates, or stammers and babbles on the pre-individual field, but begins to act and behave in a certain characteristic manner; that is to say, when gestures no longer appear as nervous, but an operative dynamism between the modern media technology and the living being becomes established. George Canguilhem points out how the relation between an organism and its milieu should not be understood merely mechanistically in terms of isolated reactions to stimuli but rather in terms of action produced by an agent capable of representing a given situation as a sensible whole: "The reaction is always a function of the opening of the senses to stimuli and its orientation relative to them. This orientation depends on the meaning of a situation as it is perceived in its entirety."[67] Accordingly, Deleuze, in *Cinema 1*, following Canguilhem as his main point of reference, outlines how the cinema gives rise to "a physico-biological domain" that corresponds to this notion of milieu as the relative outside for an agent. The cinematic action-space should be conceived as the milieu in an ethological sense that "designates the ambiance or the encompasser which surrounds a body and acts on it, even though the body reacts on the milieu."[68] The "physico-biological domain" of the moving image concerns the processes of individuation between the living being and its surroundings in cinematic embodiment. In these processes, qualities and powers of cinematic expression become actualized in determinate, geographical, social and historical space-times, whereas affects are embodied in behavior and emotions.[69] In The Great Train Robbery, basic expressive elements such as mobile viewpoints and the mobility of the image itself get incorporated into a socio-technological space-time, which is the passenger train in the Wild West, whereas affects become elements in certain kinds of emotions relating to the brutality of the bandits, for example.

The result in The Great Train Robbery, as noted, is the creation of a sphere of meaningful experience. The moving image gives rise to a "living" space with characteristic behavioral patterns and emotional qualities. A functional sensorimotor circuit is established between the moving image and the living being, one in which the latter not simply reacts to external stimuli in terms of the reflex arc but acts in a sensible situation, produces action that has a determinate function in the situation. As Simondon argues, action not only modifies a milieu but,

more fundamentally, it modifies the very network between subject and object and thus generates a new dimension for the living.[70] In action, disparate and "kaleidoscopic" perceptual and affective plurality becomes circumscribed and integrated into a unique, individual viewpoint from which the world is attributed with signification and specific goals.

One can point out these processes of individuation especially in David W. Griffith's work, which crystallizes how cinema generates several kinds of milieus determined in causal, behavioral as well as emotional terms. Let us have a short look at Way Down East (1920), a sentimental melodrama about the loss and regaining of innocence. In short, the story is about Anna Moore, played by Lillian Gish, who is driven to poverty and is forced to leave her mother's home in the countryside to visit their wealthy relatives in the city. There she is misled and seduced by the socialite Lennox Sanderson and she becomes pregnant. However, her baby dies soon after birth and Anna is left drifting. Eventually, as if by chance, she finds a position at the Bartlett's farm, where she and David Bartlett secretly fall in love. The film, in its composition, develops functional articulations between at least two different kinds of milieus individuated as particular space-times by means of parallel alternate editing. These milieus are intersubjective matrixes with diverging emotional qualities and behavioral patterns. On one side, there is the countryside that encompasses particular places of action such as the Moore's home and the Bartlett's farm in different villages. These are impregnated with various emotional qualities such as honesty, happiness, poverty, and innocence. On the other side, contrasted with these rural places, there is the modern city, which is especially mirrored in the house of Anna's relatives that is marked by luxury, secrecy and humiliation. Way Down East is largely based on the dramatic tensions between these two milieus. As Michael Allen notes about Griffith's narrative style, it plays out series of doublings, mirrorings and repetition patterns.[71] For instance, there is a mixture of comedy, shame and humiliation when Anna, arriving from the countryside, is unfamiliar with the habits, styles and fashions of the city. In the course of the film, particular actions take place that are triggered by and release these tensions: Lennox Sanderson seduces Anna in a setting of modern decadence symbolized by the parties of urban society; Anna seeks refuge in the Bartlett's home in the countryside. But the deeply religious Squire Bartlett throws Anna out of his home after having heard about her "disgraceful" past. In this way, the film brings about an organic unity, which is divided into spatiotemporally, geographically and socially differentiated parts that act and react upon each other: rural/modern, woman/man, moral/decadent. This unity is specifically characterized by different emotional charges between the parts: love, disgrace, hate.

The unity of the film is thus built on the perception of various locations and relations between them. Through dramatic lines of action, space is divided into

particular localities and acquires quality. It is inhabited and responds to the characters' actions in the way it is organized. The key technique in this differentiation is crosscutting, which organizes spatiotemporal coordination by arranging repetitions, doublings, tensions and differences between the various parts. Crosscutting shapes the rhythms, which allows cinema's intensive "spatium" to be divided into various lines of action (extension) and emotional and behavioral patterns (quality). Crosscutting allows space to become a drama of existence, a drama of life. For example, in the film's penultimate scene, the passions and emotional tensions – the film's myriad emotional register from disgrace to restrained love – discharge explosively as the secret of Anna's past relationship with Lennox as well as David Bartlett's love for Anna are exposed. Bewildered, Anna runs away from the Bartlett's home into a nearby forest. The natural surroundings become expressive of the overall emotional explosion in the form of a snowstorm in which Anna gets lost and almost drowns in an icy river. The snowstorm thus responds to the tensions between the characters by turning the environment into affective surroundings. The crosscutting technique finds its culmination here, when we see David pursuing Anna in order to save her in time. The scene alternates between two lines of action and creates a feeling of suspense, as we remain unable to determine the distance between Anna and David.[72] The tempo increases when they both seem lost in the blizzard as the figures almost vanish in the snow and our perceptions become increasingly confused. The suspense grows in an exchange of close-ups of the faces of Anna and David, which interrupts the flow of action and gives the situation its affective intensity and emotional expression. This suspension is ultimately cleared up after we experience a temporal jump, as David appears in Anna's space and rescues her from the ice floe.

Although this analysis may be too sketchy and limited to give proper credit to the film, it is important to note how in Way Down East one becomes embedded, both in terms of perception and affection, in a complex milieu that has spatial directions, various locations, as well as certain emotional and behavioral qualities, and which is active in the sense that it responds to actions. There is a synchrony between "my body" and the moving image, which the parallel editing in particular contributes to. At an experiential level, as Francesco Casetti insists, crosscutting gives a sense of ubiquity in perception from a relatively fixed point of view: "[T]he camera frames a situation, moves to another, then it returns to the first, and so on. Allowing us to witness different moments in real time, it transports us through space with such rapidity that we become ubiquitous without ever losing our sense of position."[73] Crosscutting gives us a sense of "here" and/or "there," a position from which we can locate things and beings, give the world certain kinds of spatiotemporal coordinates, and perceive it as meaningful and emotionally charged. Most importantly, crosscutting gives

us a position from which we can locate ourselves and find our existential bearings within our surroundings, and gain a sense of ourselves as purposeful agents. Space is neither an inert container of things nor a spatium in which the individual is dissolved but rather divided into dramatic trajectories and locations. It is projected as a field of actions and reactions that have a bearing on an existential burden. As Casetti points out, in our cinematic modernity, space inserts what is contained in it "within a complex environment, it declines it according to this accent or that, it defines its weight and role. In this sense, we are not before a simple container, but something that dictates and responds. In a word, we are in front of a world."[74]

In these terms, one could say that Way Down East creates a "world" of affection and action. It testifies to the sensorimotor power of the moving image to let us feel affections and perform actions. The film absorbs us into various matrixes of movements, rhythms, intensities and temporal patterns that we experience as functional, meaningful milieus shaped by certain characteristic emotional and behavioral qualities. Of course, Griffith's work in this respect, contributes to the establishment of film as a storytelling medium, improving various narrative strategies, and it also anticipates classic Hollywood cinema. But, instead of perspectives on filmic narration, what concerns us here is how The Way Down East and The Great Train Robbery claim a so-called "ethological-aesthetic" approach to cinematic experience. The notion of ethology points directly to the biologist Jakob von Uexküll's work from the 1920s and 1930s, and especially to his concept of the *Umwelt* that includes the notion of action as its significant component. Moreover, we shall also see that Uexküll's work takes us back to the biopolitical context of cinema that we analyzed in the previous chapter.[75]

"As the spider spins its threads," Uexküll wrote in his short book *A Stroll through the Worlds of Animals and Men* (1934), "every subject spins his relations to certain characters of the things around him, and weaves them into a firm web which carries his existence."[76] This is how Uexküll describes the ethological point of reference: the "phenomenal world or the self-world of the animal," that is, the *Umwelt* which is "the world as it appears to the animals themselves."[77] In other words, the *Umwelt* is the existential world of the animal, the world in which the animal lives. As such, Uexküll understands the *Umwelt* as a closed unit formed by the domains of sensation and action. According to him, the attributes of external objects are constituted by perceptual or receptor cues (*Merkmal*), which unite the perceptual or receptor signs (*Merkzeichen*) of the sensory system specific to a living being. On the other hand, external objects also depend on impulses or effector signs (*Wirkzeichen*) by means of which motor organs modulate the object following effector cues or functional significance (*Wirkmal*). Thus, "[f]iguratively speaking, every animal grasps its object with

two arms of a forceps, receptor, and effector. With the one it invests the object with a receptor cue or perceptual meaning, with the other, an effector cue or operational meaning."[78] According to Uexküll, an environmental object is perceived and acted upon – a part of the *Umwelt* – only to the extent that it possesses certain qualities that can serve as receptor cue-bearers or effector cue-bearers and thus becomes part of the fields of perception and action. The *Umwelt* is based on the sensory and motor fields characteristic of an animal in which subject and object are articulated with each other in functional cycles of affection and action.

The *Umwelt* is a closed sensorimotor whole – and the only world the living being itself is capable of perceiving and knowing. For example, out of the infinite number of stimuli radiating outward from a forest, the *Umwelt* of the tick (*Ixodes ricinus*) is composed of three receptor cues and three effector cues related to the smell of a mammal's skin, the tactile qualities of its fur, and the heat of its blood. This is everything the tick actually perceives in her search for blood, after the completion of which the tick deposits her eggs and dies. As such, it is the *Umwelt* that actually defines the tick. The organism does not simply adapt to its environment but, essentially, *is* only in relation to its *Umwelt*, and it becomes aware of itself – capable of acting and behaving – only with respect to its *Umwelt*. Furthermore, as Keith Ansell Pearson points out, in Uexküll's theory the *Umwelt* even defines the animal as a species – "species," however, not simply understood as a biological entity and approached in modern terms of relations of descent but, instead, in line with an older tradition according to which species relates to specifiers or specifications of the milieu.[79] For Uexküll, the animal as species is constituted by the affects through which it can create a world for itself. Species is defined in terms of a "semiotics of affect."

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

Uexküll observes how the properly human *Umwelt* is based on the critical duration of 1/18 of a second that forms the limit of an indivisible elementary sensation (auditory, tactile or visual stimuli occurring in shorter intervals are not perceived discretely).[80] As cinema technology exceeds this critical threshold, it connects directly to and modulates the organism and the functions that per-

tain both to the unconscious and self-awareness, the latter being signaled by goal-oriented action and the anticipation of the future. It determines the affective and functional relations that the organism is capable of, and thus it also defines how the organism becomes individuated or specified. In other words, it becomes a power-relation that determines possible actions, affective and functional capacities of the living being, and thus individuates and "specifies" the organism in a certain manner. In this respect, however, one should stress that the projection of the outside – that is, the construction of an *Umwelt* in cinema – does not depend on the natural capacities of the living being but, rather, on the cinematic system that harnesses perception and effector cues into its mechanics. As we have seen in the previous chapters, the form of life produced within the technological medium is not "natural" life but experimental, bare life that was originally resuscitated in the laboratory – a form of life that transcends the one sustained by the human organism itself. Indeed, as Canguilhem points out, "to study a living being under experimentally constructed conditions is to create a milieu for it, to impose a milieu upon it."[81]

From this perspective, the cinema appears as a kind of experimental laboratory in which affects, emotions, gestures, and facial expressions are isolated and organized, and new modes of being created. In this process the cinema resorts to the micro-temporal dynamics of vitality affects that shape the present moments, which our personal and intersubjective worlds are made of. The technique that especially corresponds to this is the close-up. From these moments, narrative flows, behavioral patterns, and emotional qualities are generated in particular settings and experiences by means of crosscutting, for instance. In other words, particular *Umwelt*s emerge from these moments in cinema – and experimentation turns into existence. Way Down East in many ways attests to this. In the penultimate scene, variations of speed, rhythm and tempo within actions in the image, close-ups and parallel editing give rise to a world where questions of life and death are at stake when we get lost and find ourselves in the blizzard again. Here cinema fundamentally functions as an existential technology in the sense that it prescribes what we can assume our world is made of and how we locate ourselves within it.

A similar perspective on cinematic embodiment appeared in a 1919 short story by the Austrian novelist Joseph Roth in which the writer describes himself as being in a small town somewhere in rural Germany.[82] What surprises him is the behavior of the local residents who display too much elegance for small-town provincial types and who are too aware of the latest fashions and styles. The protagonist finds an answer to his quandaries when he goes to the local cinema on a rainy Sunday. This is where the locals become absorbed in the moving images on the screen, following the movements and styles of characters with particular intensity. Every gesture of the heroine or the hero, every facial

expression and micro-movement of muscle is absorbed by the spectators. The moving image is thus disclosed as the source of people's behavior, gestures and expressions – from the coquettish facial expressions and head movements of the women who greet one another on the streets, to the maid who behaves like a lady, to the men who wear monocles. The cinema appears as an *Umwelt* that prescribes the capacities of affection and action. Roth describes how people construct for themselves a "second self" with which they even sometimes merge from the shadow figures, scenes and actions in the cinematic world on the screen. Spectators, in other words, incorporate the moving image as their own personal, phenomenal worlds.

This observation of how gestures, postures, behavioral patterns and expressions are absorbed in cinema was not unique to Roth alone, several other voices in the 1920s and 1930s – from Marcel Mauss's writings to the Payne Fund Studies – noticed the role of cinema in organizing life-worlds.[83] Martin Heidegger in his work on the power of technology in the biopolitical context of modernity during this period, described how technological media immanently stir and "machinate" our being.[84] Heidegger contends that the power of technology over the living operates by enclosing the living being in a structure of what he terms "lived-experience" (*Erlebnis*). This denotes a delimited, subjective world of experience. By prescribing possibilities of sensation and action, modern media and especially cinema play an important role in this enclosure, which characterizes the modern individual. "'Motion picture,'" Heidegger writes, "is the public installation of the 'new' societal comportments, fashion, gestures, and 'live-experience' of 'actual' 'lived-experiences'. It is not that films are trashy, but what they offer as the consequence of machination of lived-experience and what they disseminate as worthy of live-experience."[85] Heidegger sees the cinema as a specific kind of modulation of life potentialities. He seems to suggest that the intimate fact of living gets confused with the public image, so that cinema actually structures and modulates our being and creates particular worlds of lived-experience.

Thus we can see how the cinema operates in the biopolitical context of modernity and creates the political "double bind" that Michel Foucault understands as "the simultaneous individualization and totalization of modern power structures."[86] As Roth's tale suggests, the cinema totalizes by standardizing the processes of individuation. In other words, by capturing and modulating pre-individual singularities such as affects and bodily intensities, moving images create specific modes of being that are common to everybody. In this sense, the cinema participates in processes by which, following Foucault, biopower takes control over "relations between … human beings insofar as they are a species, insofar as they are living beings, and their environment, the milieu in which they live."[87]

This is what Heidegger's notion of "lived-experience," symptomatic of modern biopolitics, describes. It can be further deciphered in relation to what the philosopher, who was strongly influenced by von Uexküll, argues about the animal and its environment.[88] Heidegger explains that "animal" life, or life defined biologically, as well as the structure of lived-experience can be seen as identical to one another.[89] For Heidegger, the animal is essentially characterized by a certain organization of possibilities: the animal is "capable of" (*Fähigsein zu*), and what it is capable of is behavior *(Benehmen*). This basically means "seeing, hearing, seizing, hunting, fleeing, devouring, digesting, and all the other organic processes."[90] Behavior for its part is possible because of a peculiar relationship that exists between the animal and its environment, which Heidegger calls "captivation" (*Benommenheit*). The animal can behave insofar as it is captive, which denotes the animal's factual relatedness to things that actually affect it. For the animal, "[s]eeing is the seeing of *what is seen*, hearing is the hearing of *what is heard*."[91] Heidegger writes that, in this process, "the animal surrounds itself with a *disinhibiting ring* which prescribes what can affect or occasion its behaviour. Since this self-encirclement belongs to the animal, it always intrinsically bears its disinhibiting ring along with it and does so as long as it is alive."[92] The disinhibitor (*Enthemmende*) opens up the animal's environment and prescribes what the animal will become aware of and what the animal will be interested in. Moreover, the disinhibiting ring – which clearly corresponds to Uexküll's *Umwelt*[93] – determines the "innermost organization of the animal." It shapes the way in which the animal encircles itself within the environment and, consequently, the environment as such that is *open* for the animal. The disinhibitor defines what the animal *can* see, hear, taste.

It is not a question here of whether Heidegger's views on the animal are plausible or not. Instead, what concerns us is how they shed light on media technological modulations of life in biopolitical modernity. The notion of a disinhibiting ring points to biological, "animal" life as the substratum of cinema. In Heideggerian terms, it is the cinematic shaping of sensorimotor capacities as well as behavior and emotions by techniques such as the close-up or crosscutting, which appears as a mode of captivation – captivation within which the subject is driven toward and taken by what actually affects it, that is, the images of affection and action that the cinema creates in its aesthetics. Such images appear as emanating from the inside and cannot be clearly distinguished from the organism's specification. In this way the moving image takes hold of and determines the "innermost organization" of the living being caught by it. It encircles the disinhibiting ring that prescribes the capacities and contents of affection and action, and becomes what is open to us, our *Umwelt*. For Heidegger, however, this kind of life is separated from and incompatible with *Dasein*, which concerns the so-called authentic existence of humans and their fundamental openness to-

ward the world as such (that is, the world as "non-machinated").[94] In other words, biological life for Heidegger does not communicate with qualified existence, *logos*.[95] This is, of course, his criticism of cinema: it excludes authentic existence from its aesthetics. The moving image does not amalgamate the existential "there" of Heidegger's "being-there" (*Dasein*).

To summarize, we have first of all seen how the moving image encompasses pre-individual automatisms and how, as a mode of biopower, the cinema is based on the processes of selection and projection within which our most elementary affections and habits are shaped and organized. Cinematic *Umwelt*s arise out of these processes in which individuals bind themselves to their own identities and the consciousness modulated by the moving image. At critical points, pre-individual automatisms turn into emotional and behavioral patterns, and the moving image creates milieus or *Umwelt*s that individuate and specify us in certain ways. It makes no sense in this situation to separate existence from life, being from technology – or, for that matter, any kind of authentic "there" from the "here" of cinema. That is because cinematic life is constitutive of existence, while technology is constitutive of being. However, as we shall learn in the following chapters, this does not mean that there are no other modes of openness *within* the moving image except for the sort of captivation we have thus far analyzed as characteristic of cinema's biopolitical vocation.

4 Paradox-Image: Mapping the Unconscious

White Screen

Léonce Perret's 1912 film Le mystère des roches de Kador presents one of the most beautiful scenes in the early history of cinema: the female protagonist, Suzanne (Suzanne Grandais), shrinks away from a white screen filled with light in front of her and eventually she faints (fig. 9).[1] The film's story is about Suzanne who has fallen into an amnesic and catatonic state due to the traumatic shooting incident in which Suzanne's cousin has attempted to shoot her fiancé at the seashore. A Professor Williams treats Suzanne with a "new cinematographic method in psychotherapy," which consists of restaging and recording the traumatic event and then showing the film to the patient. This particular scene displays the screening of Professor Williams's film, which leads directly to Suzanne's recovery. Most importantly, having seen the film, Suzanne recovers her "faculty" of language and thought, that is, a faculty which in the history of Western thought is closely associated with articulate and meaningful speech as opposed to mere silence or the sounds of "brute beasts."[2]

The scene itself, however, is interesting in that it lacks communication, bordering on an essential speechlessness. Suzanne's appearance, in fact, can be compared to a mute Golem of sorts. As we watch Professor Williams's film, Suzanne is like a "sensitive plate," neither active nor purely passive, who is merely registering the events recreated in the screen. Williams's film shows her fiancé coming to look for her in a rowboat. Suzanne's cousin shoots the fiancé, and, even though he is wounded, he manages to pick up the unconscious Suzanne lying on the shore until he also passes out, and they are both thrown into the boat and cast adrift. However, what the scene stresses in its composition is not so much what Williams's film consists of, but rather how Suzanne gets up and recoils after the film ends and the white screen appears as the projector illuminates the room. The cathartic moment charged with a strong affective force occurs when there is nothing left to be seen but bare "imagelessness." Just as there are no words, in a sense, the images are also absent (or, rather, what the actual image attempts to bring forth is the absence of any image).

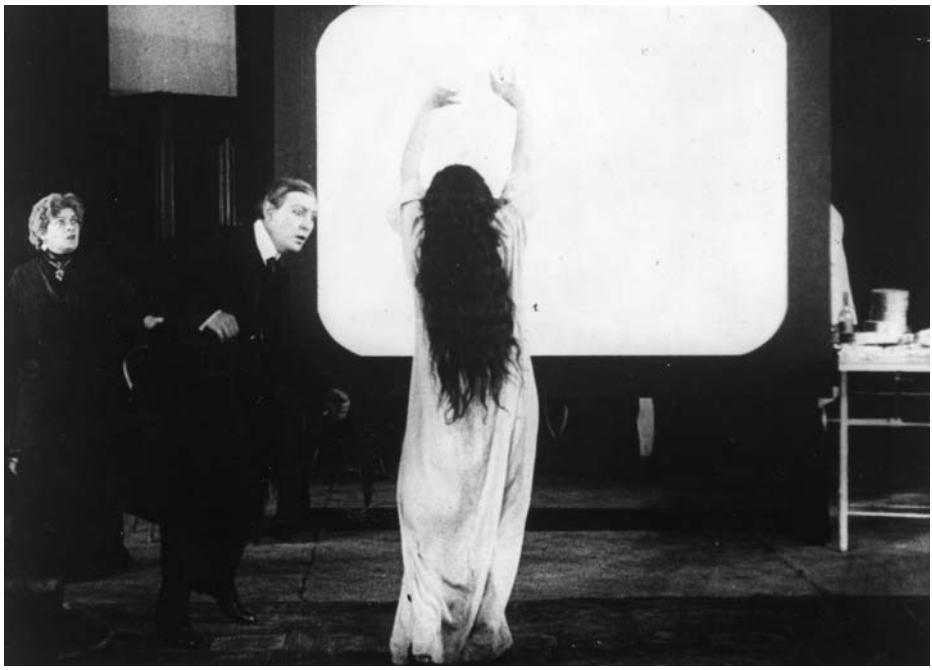

Figure 9 Still from Le mystère des roches de Kador*, by Léonce Perret Production Gaumont, 1912; Collection Musée Gaumont*

What does Suzanne actually "see" then? Kador clearly suggests that she is facing her own amnesia.[3] Suzanne passes out during the original traumatic event because her cousin has put a sleeping potion in her tea. Thus, she does not have any memory of the event. Those memories only emerge afterwards via the filmic recreation of the event. This means that Professor William's film itself is Suzanne's memory about an event she has never consciously experienced. The film does not function as the mere retention of personally experienced past events but as the impersonal and non-subjective "tracing" of her memory – as the other inside her, one that she would never have been able to recollect otherwise. In this way, for Suzanne, there is nothing to remember, and the white screen eventually displays her amnesia.

What is unique about this film-within-a-film scene compared to similar scenes from the era is this explicit and fundamental alignment of the empty white screen with fundamental forgetting. The scene does not generate the affective and even psychotic process of transfiguration between this world and the screen world such as we see in Edwin S. Porter's Uncle Josh in the Moving Picture Show (1902) or in Buster Keaton's Sherlock Junior (1924), for

instance. Keaton's film features a famous scene that depicts how the hallucinatory double of a projectionist, who has fallen asleep during a show, detaches from his original body, and walks down to the cinema to enter the movie screen so that he becomes part of the events in the film. In both Uncle Josh and Sherlock Junior, the screen is displayed as one that solicits corporeal submission and triggers affective automatisms. The screen "screens" us into its world, that is, creates an *Umwelt* composed of a bodily texture of affection and action that is characteristic of biopolitical modulations of the living.

By contrast, in Kador, cinema is articulated in terms of the automatisms of memory and thought, which embrace the changing configurations of visuality at the turn of the twentieth century. It surpasses the purely optical and the physiological and the screen becomes an opaque surface that nonetheless modulates Suzanne's psychic capacities. The screen has an "imaging" power without any actual images being projected. In this way, Perret's film sculpts a very particular picture of how memory and thinking become fundamentally coupled with a specific kind of visual dynamics and density that cinema creates. The scene is a unique thought experiment that presents the white screen as an opaque surface that challenges pictorial representation, but one that, precisely in the absence of any content, images or words, is impregnated with the depths of memory, disclosing a virtual dimension within itself. In Kador the white screen appears as that which encircles Suzanne's very potentiality to remember, in other words, a pure memory. Suzanne's process of recollection and her regaining of speech begin only after the moving image "redeems" her memory and after Suzanne has confronted her own amnesia, her incapacity to remember, before the empty screen. Thus the screen turns into a mnemic potentiality instead of any specific mnemic content. The screen is not an object to be looked at or a world to inhabit but a *capacity* to remember and find one's bearings in thought.

The scene, then, displays the moving image as potential memory and, consequently, also potential thinking, rearticulating the moving image as intimately entwined with the faculty of thought. As Giorgio Agamben has pointed out, we can understand a faculty as a power or potentiality, which is fundamentally characterized by its own privation.[4] The faculty of memory is not simply a capacity to remember but also not to remember; the faculty of thought is a capacity both to think and not think. Not-to remember or think can be characterized as unconscious like what is forgotten or unthought. Memory or thought, in other words, always relate to its outside which, in fact, is its most intimate inside in the sense that the outside encircles the contours of memory or thought, the very capacity to remember or think. While in Kador the moving image takes hold of the unconscious, the forgotten and the unthought, it simultaneously enfolds the potentiality to remember and to think. The filmic simulation

of Suzanne's recollections suggests how the moving image turns into memory itself – the white screen incorporating that which we cannot remember and with regard to which we are to remain amnesic, since memory inevitably escapes and exceeds recollection for the reason that it makes recollection possible. It is a screen of amnesia and, simultaneously, of purely potential memory, that encompasses a sphere of "sayability" or "thinkability." This scene in KADOR points to a specific virtual dimension that the moving image embodies, as the surface of the image becomes the very density of memory and thinking.

Ruptures in Vision

The scene in KADOR presents a dimension of the cinema that has not been acknowledged in the previous chapters, one that concerns a certain constellation of time, memory and potentiality. The nature of this constellation will dawn upon us in a clearer manner, if we look at the changes in thought formations concerning language and memory that emerged in conjunction with the moving image. It is namely in the genesis of conceptual thought, or as the "sayable," that the virtual dimension of the moving image becomes first and foremost tangible in an epistemological change occurring simultaneously with cinema: the generation of dynamic theories of the psyche, most notably Sigmund Freud's psychoanalysis.

What characterizes psychodynamics, as Ian Hacking notes, is the view that memory is not just a property among others.[5] A crucial point that KADOR also suggests is that memory is seen as constituting selfhood and thus providing a key to the "soul," whence the status of memory simultaneously turns problematic. Fundamentally, psychodynamics subscribes to the view that forgetting actually constitutes our psychic existence. That which is forgotten – the unconscious seen as a special sort of temporal fabric – turns into a new kind of epistemic entity and is understood as the very essence of the psyche. What becomes an object of knowledge then, is not the non-conscious neurophysiological apparatus like La Mettrie's man-machine, a reflex automaton that reemerged in Jean-Martin Charcot's view of hysteria, one that could become understood via the cinematic reproduction of its gestures and poses. Memory, or the unconscious, is not regarded as an epistemological entity that can be known via anatomical or experimental scrutiny by means of various inscription technologies. Instead, according to psychodynamics, the surface of the body hides within itself the unconscious realm as a specific temporal texture, an auto-affecting and sovereign dimension of the psyche based on forgetfulness, that expresses itself in language, or more precisely, in the automatisms of writing and speech.

The psychodynamic view begins with research on amnesia. One of the most important cases in this respect is Eugène Azam's classic Félida X, which aroused much attention in the latter half of the nineteenth century.[6] In Félida X's case pathological mental states such as somnambulism and the "doubling of life" (*dédoublement de la vie*), or "double consciousness," became inseparable from the malfunctioning of memory and amnesia. What was remarkable about Félida at the time was that one individual could have two different personalities separated by an absence of memory. Azam distinguished between what he calls Félida's first state, *état normal*, in which she is "somber and gloomy," and her second state, *état* or *condition seconde*, in which she appears as "cheerful, frivolous, and more preoccupied by her clothing and other kinds of trifles."[7] The first state suffers from "periodical amnesia," so that Félida did not remember what she had been doing in the second state. Azam observed that she "ignores all that has happened during the preceding three or four months, everything she has seen, everything she has said, everything everyone has told her... Yet, during this time, her intelligence and actions have been complete and reasonable."[8] These occasions of *dédoublement* are accompanied by corporeal disorders such as anesthesias in parts of the body, hyperesthesias, spasms, and other abnormalities of the senses. Accordingly, Félida is described as a hysteric. Azam, a friend of Paul Broca's, whose authority actually made Félida's case famous, understands periodical amnesia as due to the impaired flow of blood to the hemisphere in which memory is located. However, Félida's case also stimulated other conceptualizations of memory and selfhood. For Hippolyte Taine, the case represented an argument against the philosophical presupposition of a unitary "I," an *in*-dividual, that is, against any transcendental soul or noumenal self.[9] On the other hand, Azam's vocabulary and the very idea of a double personality is significantly addressed by Joseph Breuer and Freud in their *Studies on Hysteria*.[10]

The emphasis on memory, as we have already noted, signifies an epistemological shift as to *how* the psyche is comprehensible. The problematic of understanding the psychic life moves from the physiological surface to the density of memory and time. A case in point is Jules Janet's observation of Marie "Blanche" Wittman, a famous patient of Charcot's at the Salpêtrière, whose "hysterogenic zones" Albert Londe had been cutting up into discrete units with his chronophotographic apparatuses. Instead of locating the etiology of Blanche's somatic troubles (anesthesia and analgesia) simply on the visible surface of the body, Janet noticed that these troubles were actually caused by a dissociation of the patient's ego; Blanche's suffering was caused by her malevolent second personality, Blanche 2.[11] It was the work of Jules Janet's brother, Pierre Janet, that marked a crucial milestone in this shift toward a more dynamic conception of the psyche. It shifted away from an anatomical-physiologi-

cal explanation of neuroses and opened up a psychological view on the issue. Pierre Janet believed that the psyche and personality consists of memory, with the psyche evolving into a temporal rather than a spatial problem. Henri F. Ellenberger even characterized one of Pierre Janet's leitmotivs as "time travel," or a conception that the entire past lies in the present.[12]

The central point of Pierre Janet's early work, as we have seen in the previous chapter, is the notion of psychological automatism, which developed in research on hysterical patients. This notion also continues on the theme of automatisms, which was crucial to both late nineteenth-century theories of hysteria and the formation of moving images. Janet, however, did not maintain a strictly mechanistic-physiological view of "non-consciousness."[13] Instead, he chose to view psychological automatism in terms of elementary sensorimotor and mnemic images, which are not integrated into an individual's personality and are basically unconscious in the sense that they are not part of personal judgment. Janet coined the term subconscious (*subconscience*) to help explain the existence of psychic phenomena, actions, thoughts, memories, outside of the personality: these kinds of phenomena follow an autonomous and "automatic" development in the subconscious. Consciousness, according to Janet's theory, is defined as a power to form new syntheses. It is an active capacity to synthesize different tactile, kinesthetic, visual and acoustic impressions ("images") into a coherent and meaningful whole, which is personality. When the automatism escapes conscious control, "fixed ideas" in memory are revived and rise to the surface. The dissociation (*désagrégation*), which separates the memories that constitute personality from consciousness, leads to the simultaneous existence of multiple personalities that express themselves through automatic writing, for example.[14]

Generally speaking, a decisive step in the conception of the dynamic view of the psyche is that fragmented images that do not fall under the control of consciousness are not regarded as only following neurophysiological conditions that are referable in their apparent visibility. Various layers of psychic existence make themselves manifest in the disclosure of a temporality that does not apply to the cinematographic cutting up of the body according to discrete instants. In this regard, the oft-highlighted epistemological shift by Freud from "looking to listening" can be seen as an emblematic one.[15] Charcot, the great seer, does not see any significance in the "incessant babbling" of hysterics, while Freud, on the contrary, clings to these perhaps nonsensical utterances, stressing the importance of verbally produced phenomena. The word formations of hysterics should be taken seriously and made comprehensible: "The psychical process which originally took place must be repeated as vividly as possible; it must be brought back to its *status nascendi* and then given verbal utterance."[16] On the other hand, this shift toward language is based on a more fundamental view regarding the temporal constitution of the psyche – it is memory that constructs

our psychic existence. Freud, like Janet, pays attention to the depths of memory and the patient's personal history instead of the surface of the body and the spatial and visual localization of "hysterogenic zones." Instead of cutting into the time of the nervous apparatus, Freud argued that pathogenic psychic material should be cleared away "layer by layer" by penetrating "into deeper layers of... memories."[17] This new perception and concept of the psyche shifts from a spatial plane of reference to a framework constructed around temporality, one that is fundamentally invisible.

This temporal framework is cunningly highlighted in Le mystère des roches de Kador, in the scene where the image surface becomes impregnated with the depths of memory, simultaneously suggesting how the moving image is linked in an essential manner to the new perception and conception of psychic life. Cinema in Kador is not simply displayed as the space of retention that preserves the past images of personal memories, but rather as a technology that holds the key to the constitution of memory itself, a notion that is visually rendered as an opaque and empty surface that bears the enigma of the constitution of the psyche. This type of visuality is not unlike what Gilles Deleuze argues regarding the cinema's "direct presentation of time."[18] Deleuze suggests that cinema is able to disclose the operation of time that he – based especially on Henri Bergson's reconfiguration of time and memory at the turn of the twentieth century – understands as being founded on how time splits into two heterogeneous directions: the present that passes and, at the same time, the past that is preserved. The first represents the actual unfolding of time, launched into, and anticipating, the future, as the present is already becoming another present. The second represents how time enfolds, wraps around itself, forming an abyss of vast temporal circuits that are preserved as virtuality in the present. The first is characterized by the sensorimotor scheme – empirical experience and what Bergson calls "habit-memory" – that projects possible actions into the future. The second constitutes pure memory or pure recollection that, from a subjective viewpoint, also inevitably includes forgetfulness and otherness in the "in-dividual." It constitutes a pure past, which is a time that has never been lived and should thus not be confused with psychological recollection. This is a time that is not ours but where we are and to which we are internal, the inexorably forgotten that nevertheless founds memory. Although pure memory certainly cannot be presented by an actual image, Deleuze argues that it is precisely this incessant splitting of time that the moving image is capable of embodying. According to Deleuze, a rupture may occur in the irreversible unfolding of the images, one in which the present image finds its contemporaneous past in a virtual mirror image and a limit is established where the present and the past even become confused. It is precisely this limit that the scene in Kador explores structurally by constructing a series of interconnections between the actual im-

age, the past that is produced and repeated (through this very production process) by the cinematographic apparatus, and, perhaps most importantly, the immemorial white screen as an idea of pure memory or pure virtual image. The scene generates a visionary moment, a rupture of sight, which, instead of sensorimotor extension, introduces mnemic and noetic linkages.

What is essential here is the idea of pure or potential memory that the white screen incorporates: the visual begins to become intimately linked to the depths of time and mental relations. In the history of cinema, this mode of vision also became thematized, although it was not directly scrutinized structurally, by all the *Doppelgängers* and split personalities that haunt Max Mack's The Other (*Der Andere*, 1913), Stellan Rye's The Student of Prague (*Der Student von Prag*, 1913), and Robert Wiene's The Cabinet of Dr. Caligari (*Das Kabinett des Doktor Caligari*, 1919). The scene in the Jewish cemetery in The Student of Prague presents a flashing moment in which virtual forces from the depths of memory emerge and become incarnated, with the multiple exposure technique, in the image of the protagonist Balduin's doubles. Time splits in the interval of the *Doppelgänger* shot, and there is a rupture in the course of action that essentially evokes past images. Movement is interrupted and the sensorimotor relationship with the image is broken when Balduin confronts his virtual double, a vast memory-circuit, as if he is gazing into a mirror. Balduin, like Suzanne in Kador, is not an agent but a "seer" who, to follow Deleuze, "records rather than reacts. He is prey to a vision, pursued by it or pursuing it, rather than engaged in action."[19] What in the end Balduin is pursued or haunted by is a vision of time in terms of the other inside him that recurs in the circuits of pure memory. When Balduin confronts his double at the cemetery, he has actually encountered the figure of what he has always already forgotten, one that emerges from the abyss of time and returns as the other. In the interval, to quote Bergson, attentive recognition breaks down and "the person... becomes a stranger to himself, ready to be his double, present as a simple spectator at what he is saying and doing."[20] In other words, what happens in the cinematic interval between the two Balduins is that the moving image transposes forgetfulness – that is, the very fabric of memory – to its own mediality.

Writing Pad

The moving image is thus connected to the formation of psychodynamics in terms of a shared perception of memory and temporality. More precisely, what determines both the cinema and the dynamic view of the psyche, and "structurally" connects the two with each other, is the problem of temporal repetition

concerning how the past is conserved and repeated in the present. Both view the psyche as essentially temporally constituted.

It is the problematic field of temporality, memory and the psyche that also shapes the emergence of psychoanalysis. From early on Freud was already approaching the psyche from a temporal angle, which is similar to cinematic renderings of time in films such as Le mystère des roches de Kador or in The Student of Prague. In a note from 1897, Freud observed how the analysis of (hysterical) symptoms that were manifested in the present required a gradual exposure of the underlying "scenes" or memories. In outlining his views, Freud drew a diagram (fig. 10) and explained:

> [S]ome of the scenes are accessible directly, but others only by way of phantasies set up in front of them. The scenes are arranged in order of increasing resistance: the more slightly repressed ones come to light first, but only incompletely on account of their association with the severely repressed ones. The path taken by [analytic] work first goes down in loops to the scenes or to their neighbourhood; then from a symptom little deeper down, and then again from a symptom deeper still. Since most of the scenes converge on the few symptoms, our path makes repeated loops through the background thoughts of the same symptoms.[21]

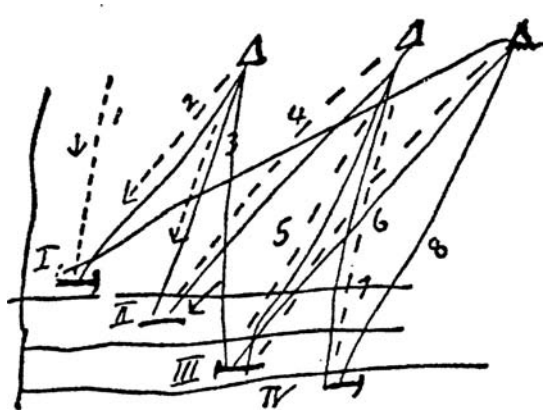

Figure 10 Freud's diagram, dated May 25, 1897
Acknowledgements: Sigmund Freud © Copyrights, The Institute of Psycho-Analysis and The Hogarth Press for permission to use the diagram from "Draft M, Notes II" of volume one of The Standard Edition of the Complete Psychoanalytic Works of Sigmund Freud, *translated and edited by James Strachey. Reprinted by permission of The Random House Group Ltd.*

This outline shows the psyche as something comprehensible in a kind of moving image, one that would operate in a perpetual loop-like exchange between

the present (the symptom) and the past or memory (the scenes), which would be laid bare in this process. These loops expose a salient problem regarding the temporality and recurrence or repetition that marks Freud's thinking as a whole, which became increasingly evident after the First World War when Freud revised his views about our instinctual life by noting that it was also based on an insistent "'perpetual recurrence of the same thing.'"[22] Freud's thought encountered the moving image because both pointed in the same conceptual direction concerning the nature of the psyche. In other words, the emergence of both the moving image and Freud's theories coincided not only historically but also in terms of a shared problematic field. Some of the major postulates of psychoanalysis, in fact, have the moving image as their problematic element. This amounts to how the moving image generates a capacity to think of a new temporally related "epistemic thing" called the unconscious or, more generally, "psychic reality," that Freud brings forth. As we shall see, this capacity manifests itself first and foremost in terms of the paradoxical status that the moving image enjoys in Freud's epistemology.

The encounter between Freud and cinema, however, is by no means unambiguous. In his theoretical writings, Freud remains stubbornly silent about the new medium, and the word "*kino*" ("moving pictures") occurs only in his correspondence. In a letter dated September 22, 1907, Freud wrote from Piazza Colonna in Rome about how cinematographic performances leave him "spellbound" (*der Zauber zu wirken*) among a crowd that is waiting for a repetition of this particular technological spectacle.[23] The moving image, for Freud, did not seem to serve any function worth noticing other than how it appealed to the scopic drive in the context of consumer capitalism. Epistemologically speaking, Freud believed it did not have the necessary rationality to enter our perception and conceptualization of the unconscious.[24] This negative attitude becomes evident in relation to the so-called film affair of 1925, when Berlin-based psychoanalysts Karl Abraham and Hanns Sachs agreed to cooperate with the UFA company in the production of Georg W. Pabst's popular scientific film about psychoanalysis, Secrets of the Soul (*Geheimnisse einer Seele*, 1926). In response to Abraham and Sachs's solicitation to authorize the project, Freud withdrew, stating: "I do not believe that satisfactory plastic representation of our abstractions is at all possible."[25] The problem for him was that the unconscious is not translatable into images or "figurable" (*darstellbar*). The moving image for him did not have the ability to transpose or translate the unique thoughts of the psyche that Freud managed to dredge up with psychoanalysis. Psychoanalysis, in other words, was superior to cinematic showing in Freud's eyes.[26]

Mary Ann Doane points out that Freud's negative attitude was due to his understanding that cinema lacks a certain "legibility" or rationality and, instead of being capable of differentiating and thus making it amenable to abstraction,

cinema, by its very technological nature, records everything and thus produces too much of the accidental and the "irrational."[27] Cinematic presentation in its mechanics does not select and reduce the way that human perception and consciousness does and thus it seems to be too unique, materialistic and accidental to generate differentiating apperception. It seems to simply repeat, without differentiation, while Freud believed that linguistic expression had the exclusive ability to prove rationalization. The talking cure, for example, focused on getting rid of an hysteric's painful memory-pictures by translating them into words so that "the picture vanishes, like a ghost that has been laid."[28]

However, an ambiguous element already inheres in Freud's epistemology as regards cinematic recordings and repetitions of the irrational. That is because the epistemology itself is methodically based on appropriating the accidental, the incoherent and unstructured by adhering to what Freud calls suspended attention.[29] The talking-cure or self-analysis implies that one must reduce critical and selective mental activity in order to objectively record and apprehend the singular and the seemingly most insignificant incidents. Freud emphatically compared this technique to a mechanical one: the analyst "must adjust himself to the patient as a telephone receiver is adjusted to the transmitting microphone."[30] In following the functions of self-recording machines common in laboratories of experimental physiology and psychology, the ideas needed to be written down "as they occur."[31] Thus Freud's methodology is similar to the logic of the technologies of reproduction that were emerging at the same time as psychoanalysis, especially the gramophone and cinema. Freud's self-analysis – which lead to the concept of a certain psychic reality – was based on the accidental and the unintelligible just as much as the first stop-motion tricks in the Edison Manufacturing Company's or Georges Méliès's films were.

The mechanical purification of the observer (which, as we have seen, is common to nineteenth-century science in general), nonetheless, is only one part of the psychoanalytic epistemology "rebus" because the isomorphism between the analyst and modern media technology primarily touches upon certain methodologies. Furthermore, there is the question about Freud's conception of the very notion of a psychic reality, which the appropriation of "nonsense" presupposes; in other words, the question of how Freud's understanding of the fundamental texture of our psychic life is shaped. In this respect, it is not the technological configuration so much as the virtual dimension of the moving image that acquires a significant yet unrecognized and even unconscious, and thus paradoxical, role in Freud's theories. Despite Freud's conscious effort to exorcize "plastic representation" from his epistemology, a distinctive dimension of the moving image is manifested in a curiously silent manner in Freud's basic metapsychological theory. It becomes substantial in the fundamental problem of how to comprehend a psychic reality that unlike a metaphysical entity retains

its immanence and tangibility but cannot be perceived by the senses. This problem, Freud pointed out, is focused on the notion of a specific psychic locality.[32]

It should be noted that there is an inherent paradox in Freud's psychic topology, because, since the psyche is connected to memory and conceived in temporal (dynamic) terms, it seems to conflate with all notions of a specific location. Nevertheless, or precisely for this reason, Freud was preoccupied with a concrete model of his conception of the "mental apparatus" during the course of his entire career. In *The Interpretation of Dreams* (1899), Freud presents the famous optical model:

> I propose simply to follow the suggestion that we should picture the instrument which carries out our mental functions as resembling a compound microscope or a photographic apparatus, or something of the kind. On that basis, psychical locality will correspond to a point inside the apparatus at which one of the preliminary stages of an image comes into being.[33]

This passage reveals a strange recurring notion of the image that appears like a ghost from behind, whenever Freud attempts to articulate one of the most fundamental aspects of his metapsychology. The psychic locality is described in terms of an image, however not as an actual form but in terms of a virtual, dynamic image, an image that is in the process of formation.

However, this optical model runs into difficulties from the very beginning, because one of the cornerstones of psychoanalysis is explaining the psyche in terms of functions ("systems") and, in this respect, to make a distinction between consciousness and the unconscious, or memory. For Freud, the complexity of the psyche cannot be reduced to a *camera obscura* model that described the mind as something composed of static pictures reflecting the outer world.[34] Thus the problem was how to join these two systems into a single one. "[T]here are obvious difficulties involved in supposing that one and the same system can accurately retain modifications of its elements and yet remain perpetually open to the reception of fresh occasions for modification," Freud wrote.[35] Or, as Breuer observed: "The mirror of a reflecting telescope cannot at the same time be a photographic plate."[36] The problem for Freud in modeling the psyche is how to conceive the image that is both open to new impressions and simultaneously retains its modifications on itself; an image that is both a perpetually open surface (the system perception-consciousness) and an unlimited "depth" of impressions (memory).

This problem arose again in Freud's final model of the workings of the mental apparatus. In a 1925 short essay entitled "A Note upon the 'Mystic Writing-Pad'" Freud introduces a device that he thought was capable of fulfilling the two-fold function of fleeting perception and permanent retention, namely, a child's drawing – or rather etching – toy called the Mystic Writing-Pad.[37] To

put it simply, the device consists of two detachable parts. The lower part consists of a slab of dark brown resin or wax, while the upper part is a transparent sheet consisting of two layers: the lower one is made of translucent waxed paper while the upper one is a transparent piece of celluloid. The upper two layers, according to Freud, conform to the functions of the *Pcpt.-Cs.* system because it receives its stimuli (etching) through the protective shield that diminishes the strength of the incoming excitations. However, when the upper part is detached from the lower part, all of the etchings vanish from the former. In this way, the *Pcpt.-Cs.* system remains transitory, in a state of flux. Instead, the wax slab retains permanent traces of each excitation. It thus conforms to the unconscious that Freud likens to a "reservoir" of memory traces; the unconscious is a retention space in which "nothing can be brought to an end, nothing is past or forgotten."[38] To be precise, one should note that what is inscribed on the wax slab is not related to representation or semblances of the excitations from the outer world. Freud was already proposing that memory was not a mere repetition of a content but one of energetic differences comprised of mnemic intervals in "The Project for a Scientific Psychology" (1895).[39] The unconscious records "differentiations" rather than representations.

This model also focuses on the problem of psychic locality as a "self-modifying" image in the form of actual images ("etchings") that are retained in their virtuality on the wax slab. More precisely, the Writing Pad's wax slab retains differential relations, intervals, of images, ones that are dynamic or in the mode *dynamis* – i.e., potential images that may or may not (re-)emerge into actuality. One could say that the Writing Pad embodies a type of configuration that is similar to the scene in Kador that presents the doubling of the present and past in its visual dynamics. The status of this kind of moving, self-modifying image that the model incorporates in Freud's thinking – an image that encompasses the simultaneous double movement of the passing present and the preservation of the past – is nevertheless doubly paradoxical because firstly, the paradox concerns self-motion. Freud in "Note" observed that: "If we imagine one hand writing upon the surface of the Mystic Writing-Pad while another periodically raises its covering-sheet from the wax slab, we shall have a concrete representation of the way in which I tried to picture the functioning of the perceptual apparatus of our mind."[40] Jacques Derrida, in this regard, astutely refers to how early Freud pictured the psyche as a machine that "in a moment would run of itself."[41] In a crucial manner, however, the notion of self-motion eventually generates a fundamental disparity between the Mystic Pad and the psyche, and thus challenges the concreteness of the model. Freud wrote:

> There must come a point at which the analogy between an auxiliary apparatus of this kind and the organ which is its prototype will cease to apply. It is true, too, that, once

> the writing has been erased, the Mystic Pad cannot "reproduce" it from within; it would be a mystic pad indeed if, like our memory, it could accomplish that.[42]

Derrida described Freud's characterization of the machine as inevitably "dead" as extremely Platonic because only the soul, a truly psychic trace, is able to reproduce and represent itself spontaneously. What emerges is an opposition between the tool (or toy) and thinking, surface-images and psychic depth. The second part of the paradox concerning the psychic depth deals with the fact that Freud conceived of memory and the unconscious in spatial terms. Freud's conception implies a paradox that concerns the infinity, unlimited nature of the hypothetical space of storage and the set of potential inscriptions. Freud's model requires a space that cannot actually be located in any particular place. Doane aptly suggests that it requires "a virtual space – a space that is thinkable but not localizable."[43] The paradox amounts to the wax slab potentially becoming the infinite set of the world's impressions.

The double paradox that directs Freud's thinking thus involves a self-moving virtual image, which reproduces itself as the potentiality of our psychic existence, as the potentiality of memory. The paradox, in other words, concerns the intertwining of the image with movement and time. Although it is often understood mainly in the context of language and writing, we can now see how Freud's conception and modeling of the psyche actually displays a specific configuration of the self-movement of the image and its influence on the perception of time and memory, one that can be seen as emblematic of our cinematic modernity. What is the role of this paradox and, consequently, of the moving image in Freud's thinking? Generally speaking and in following Deleuze's argument in *The Logic of Sense*, a paradox functions as a genetic element of thought.[44] The term genetic does not here refer to the neurobiology or physiology of the brain but to the unique elements of how thinking generates and proceeds. The paradox moves simultaneously in two separate directions, as in Freud's case with the moving image that points both to the concrete apparatuses and the abstract entity called psychic locality. As such, according to Deleuze, the paradox is an element that encompasses sense. The paradox is by no means simple nonsense (the absence of sense) but rather, to put it in Heideggerian terms, that which gives food for thought and this food is sense. In Deleuze's treatment, sense is the element that "insists" in propositions, it is what is expressible or "sayable" in a proposition (but not a proposition itself), and being the expressible element, sense allows the proposition to signify, to express something. Thus, the paradox is one of the essential elements from which thinking emerges.

From this perspective, one can argue that insofar as the moving image functions as the paradoxical element in Freud's theories about psychic locality, it is the moving image in particular that provides the notion with its sense – i.e., it

makes the notion sensible. Freud's use of the unique notion of the image to explain psychic locality is not solely a metaphorical operation but the image also functions at the very core of the genesis of thought. Following this line of reasoning, beyond Freud's dogmatic proposition "I do not believe that satisfactory plastic representation of our abstractions is at all possible" there is an element of "expressibility" or "thinkability" concerning what "our abstractions" refer to – and this element is the moving image. In Freud's case the moving image appears as a *paradox-image* in the sense that it becomes what is expressible or sayable in Freud's thought, in other words, not an image of actual thoughts and their contents but an image as the potential to think. In Freud's case, the moving image emerges as the unthought in thought, which gives Freud the capacity to create a set of propositions about psychic locality. In other words, at the turn of the twentieth century, the moving image was incorporating the morphogenetic potentiality of Freud's notion of the specific locality as a paradoxical rhythm that directs the notion's formation and makes it sensible. In Freud's case, the moving image becomes the "thinkability" of the psychic reality.

m & n

Generally speaking, the moving image – when not approached from the viewpoint of its techno-physiological materiality as in previous chapters – is endowed with a certain capacity to generate and direct the formation of thinking. As Freud's case shows, the paradox-image becomes the immanent potentiality to think. For instance, we can indicate this kind of image that is operating in Freud's diagram referred to above and the movement of thought the diagram incorporates. The diagram reveals the kind of "imaging" force that cinema embodies. We begin to see how the moving image is simultaneously restricted neither to the optical nor the physiological and is capable of generating what we can say and think about the world.

Let us continue with Freud's case in deciphering how the moving image was related to new configurations of the sayable and the thinkable at the turn of the twentieth century. Freud believed that knowledge of the psychic locality is manifestly saturated with words, as the move toward the comprehension of hysterical "babbling" has demonstrated. In this respect, however, psychoanalysis begins with research into an inability to speak, or to understand written or spoken language, into the noise that aphasics experience instead of meaningful words. Freud's 1891 study on aphasia can be seen as anticipating what emerged as the metapsychological knowledge of the workings of the psyche.[45] Freud, unlike Pierre Janet, proposed that individual psychic unity was not established

at the level of personality level but at the level of language; it is based on the unity of the associative field of language. Aphasia, from this viewpoint, is a disorder of association. Freud's view here is highly influenced by Hughlings Jackson's theory of the nervous system as consisting of separate functional levels with different structures and levels of evolution. According to Jackson's theory, aphasia does not concern specific locations of speech centers but "the state of the nervous system" and its dissolution or regression to lower functional levels. It is partially due to Jackson's efforts that Freud ended up distinguishing between primary and secondary functions or processes of the nervous system in his "Project for a Scientific Psychology." This distinction became the basis for the establishment of the "locality" of the unconscious and the system *Pcpt.-Cs*.[46] Freud also initiated the fundamental notion in the "Project" of what eventually distinguishes the two functions is speech, and more generally, linguistic formulation. Unconscious associations consisting of flows of quantitative energy in the "ψ-neurones" (primary process) acquire quality and thus become conscious when they are attached to "word-images," later called "word-presentations" (*Wortvorstellung*).[47] Becoming conscious of an idea occurs when it is "cloaked" in words, since only they are able to give quality to flows of energy that establish psychic processes. Thought takes place primarily in words.

Based on this distinction, Freud established that word-presentations and visual images function on different levels. In his study on aphasia, Freud had already connected visual presentations with object associations and the "lower" functional level of the nervous system in Jacksonian terms.[48] This view is consistent throughout Freud's work, as becomes evident in an argument in *The Ego and the Id* (1923): "Thinking in pictures is... only a very incomplete form of becoming conscious. In some way, too, it stands nearer to unconscious processes than does thinking in words, and it is unquestionably older than the latter both ontogenetically and phylogenetically."[49] Freud thought that the unconscious, deprived of language (as well as thought), was composed of thing-presentations (*Sachvorstellung* or *Dingvorstellung*), which are defined as consisting "in the cathexis, if not of the direct memory-images of the thing, at least of remoter memory-traces derived from these."[50] Thing-presentations do not resemble facts or things and are more like reinvestments or "vitalizations" of mnemic traces. Their relationship to word-presentations is approached in terms of regression, which occurs both in dreaming and in neuroses: when an idea moving into consciousness along "the normal path" – through linguistic formulation – is hindered for some reason, the idea is transformed back into the sensory image from which it had originated.[51] Images escape the control of words, and revive with the result that hallucinations occur.

In a sense, then, according to Freud's divisions, the image encompasses a bare or simple repetition, whereas the word tends towards differentiation. The im-

age, to paraphrase Freud in a letter to Fliess on December 6, 1896, marks "the presence of 'survivals'."[52] In other words, the image incorporates memories that behave as if they were current events. This temporal recurrence amounts to a failure in the genesis of consciousness that Freud describes in the letter as a chain of re-arrangements and re-transcriptions. The generation of consciousness encompasses a gradual process in which "signs" (*Zeichen*) that exhibit perceptions are reproduced and re-arranged within the unconscious and preconsciousness, so that "thought-consciousness" eventually arises from this "process of writing and rewriting," as Daniel Heller-Roazen characterized it.[53] The image, the one that survives and recurs, thus marks a fissure in the chain of psychic "writing" that leads to the emergence of thought-consciousness. More precisely, it marks a break in what Freud calls "translation" which – despite all of its ambiguities – refers to the frontiers at which different temporal periods (epochs of life) are organized, and thus to the process of forgetting. The image incorporates temporal recurrence due to which these frontiers become blurred. Yet this temporality also haunts language itself. In Freud's conception of aphasia, to quote Heller-Roazen:

> It is that aphasia, contrary to the common conception, constitutes not a type of forgetfulness but exactly the reverse: an aggravated form of recollection, in which individuals, unwilling or unable to "re-arrange" or "re-transcribe" the "signs" of their perceptions, remember, so to speak, too much, condemned to the perpetual recurrence of one utterance at the expense of all others.[54]

Thus it is as if the image worked from within these fissures of language – or amnesia – as a disturbing force.

This point already suggests that the demarcation between image and word is not simply one of qualitative opposition. At least words are not simple transcendental signifiers with a latent meaning that needs to be unraveled. Michel Foucault notes how Freud considered that linguistic signs envelop a malevolent element, since the sign conceals itself in a myriad of associations and comes only after its interpretation.[55] What is the source of this malevolence? In *The Interpretation of Dreams*, Freud reported that he saw a sign in a dream that either read "You are requested to close the eyes" or "You are requested to close an eye."[56] Discussing how the dream-work transforms logical connections implicit in dream-thoughts, Freud observed that he usually wrote the either-or relation as follows:

$$\text{You are requested to close} \begin{matrix} \text{the} \\ \\ \text{an} \end{matrix} \text{eye(s).}$$

It is remarkable that in this short passage words become inseparable from the typographical space surrounding them. As Freud specifically noted, the so-called interpretation of the dream in question depends to a large extent on which spatial conjunctions and disjunctions between linguistic signs are followed, since words undergo a treatment of *malformation* and become ambiguous in dreams as they do in paranoia and hysteria.[57] Moreover, Friedrich Kittler has pertinently argued that *The Interpretation of Dreams* in general "conducts the analysis of signs solely according to the place values of discrete elements."[58] Signs evolve into spatial units. The malevolence of signs implies first and foremost that they always tend to approximate things not unlike tricks performed by children who, as Freud argued, "sometimes actually treat words as though they were objects."[59]

Knowing the psyche, then, is not based on a voice impregnated with signification but on the materiality of written signs that are, fundamentally, senseless – at least from the viewpoint of signification. In the analytic situation, Freud maintained a "suspended attention," true to the heritage of experimental psychology and similar to an automatic self-recording machine, in order not to select but to register virtually everything, especially the accidental and the insignificant like parapraxes and puns. Thus the malevolence of signs amounts to a situation in which the epistemological shift from looking to listening noted above remains ambiguous. Kittler points out that the talking cure is far from listening in the sense of understanding and interpreting.[60] It is instead an automated, mechanized way of channeling discrete discursive elements. This situation is similar to "a technical contest," where words themselves threaten to degrade into the stochastic "white noise" from which they have emerged. Psychoanalysis cannot replicate translation actions that are characterized by traditional hermeneutics, since words do not have a point of reference outside themselves. Kittler places this aspect of psychoanalysis into the late-nineteenth-century techno-scientific context, one that emerged out of modern technological media that actually made it possible to store single, idiosyncratic and accidental messages. The science that crystallized this logic was psychophysics in which discourse becomes nothing but a fundamentally arbitrary repetition of discrete linguistic functions that defy subjective interiority. A case in point is provided by recall experiments in which strings of nonsense syllables with no meaningful association relegate memory to its statistical scrutiny and, finally, physiology.[61]

However, associating Freud with the psychophysical sciences of the era only reveals a small portion of the rebus. The issue with Freud is not one of purely techno-physiological materiality but rather a conception of language based on a certain kind of figural sense. In other words, how Freud made sense of the psyche was not limited to linguistic meaning or meaninglessness but also incorporated an aspect of visuality. This is first found in Freud's theory of hysterical

conversion in which the body replaces verbal utterance – "somatic expression" replaces linguistic one and words become silent repetitions of gestures and bodily poses, as it were.[62] Words are transformed into flesh especially in the process of hysterical conversion via symbolization, in which verbal formulation serves as an intermediary between affect and somatic symptom. The phrase "a slap in the face," for example, allows a certain memory or a train of thought to be incorporated into a trigeminal neuralgia. What we see here is the bodily acting out of the literal meaning of a figurative verbal expression. This bodily expression, however, should not be merely regarded as a result of an individual's voluntary actions. Instead, the visual persists and recurs as the virtual playground of language.[63] Freud believed that hysterical conversion revealed something about language itself, since "hysteria is right in restoring the original meaning of the words in depicting its unusually strong innervations... It may be that it does not take linguistic usage as its model at all, but that both hysteria and linguistic usage alike draw their material from a common source."[64]

Secondly, the "common source" becomes clear when Freud in *The Psychopathology of Everyday Life* recorded a patient recalling a story from his childhood:

> He is sitting in the garden of a summer villa, on a small chair beside his aunt, who is teaching him the letters of the alphabet. He is in difficulties over the difference between *m* and *n*, and he asks his aunt to tell him how to know one from each other. His aunt points out to him that the *m* has a whole piece more than the *n* – the third stroke.[65]

When this apparently insignificant childhood scene is analyzed by Freud, it begins to unravel in a particular manner. The opposition of *m* and *n* appears as a "symbolic representation" of the opposition between the sexes.

> For just as at that time he wanted to know the difference between *m* and *n*, so later he was anxious to find out the difference between boys and girls and would have been very willing for this particular aunt to be the one to teach him. He also discovered then that the difference was a similar one – that the boy, too, has a whole piece more than the girl.[66]

In this passage, Freud is not concerned with the letters themselves and his analysis has little to do with significance.[67] Instead, Freud was treating the letters as images of themselves, and what concerned him was the figural difference, a figural interval, between *m* and *n*. He framed the letter as its own "differential" image: the letter *m* is not a discrete element in the alphabet but a figure with a third stroke distinct from the *n* with its two strokes and the absence of an extra piece.

What matters here is the figural difference between the letters, which eventually provided Freud's analysis with a certain sense. This difference does not

concern actual or virtual reference. From within language, Freud managed to carve out the most intimate materiality that evinces a fundamental incapacity to denote or signify. Words become increasingly unable to control things and it is as if things were functioning at the core of words themselves. That is to say, words become images of themselves, and it is this imaging or figural force that actually gives them their capacity to signify something.

In this respect, Freud's approach finds its artistic equivalent in the work of Freud's contemporary, Stéphane Mallarmé, especially his *Un coup de dés jamais n'abolira le hazard* (1897), where words eventually lose their "immaterial" affirmative and semantic function and become dependent on their spatial placement. The force of a white sheet of paper, so to speak, mobilizes, twists and regulates the rhythms of words so that they acquire sense primarily through their position in the typographic space. Words do not designate, or correspond to, things, instead, they become utterly self-referring while they circulate in the intersections of the spatial constellation of alphabetic material and empty spaces. Thus, Mallarmé writes in *Variations sur un sujet*, that the words are "transposed."[68] Transposition here means that the page opens up a dimension of potentiality, that is, potential connections between linguistic elements. Words are released from their linear succession and acquire unresolved simultaneity with potential future, past and present connections between them. Mallarmé, in the "Préface" to *Un coup de dés*, pointed out that "[t]his copied distance, which mentally separates words or groups of words from one another, has the literary advantage, if I may say so, of seeming to speed up and slow down the movement, of scanning it, and even of intimating it through a simultaneous vision of the Page."[69]

For the poet, linguistic elements become mobile images (of themselves), forming series between one another in acceleration or suspension. Mallarmé's perception of the movement of words then merges with cinematic vision, based on the editing of diverse elements into a constellation that can achieve simultaneity and is capable of modulating speed. Paul Valéry noted this with respect to *Un coup de dés* when he argued that the poem's typographic space generates temporal forms and figures similar to a cinematographic shot.[70] Indeed, several experiments on filmic expression from the 1920s show words getting caught up in a kind of non-linear temporality in the cinema.[71] A scene from Fernand Léger's Ballet méchanique (1924) presents linguistic signs as elements of the plastic, moving composition of the film's "spectacle of things." A text that reads "*On a volé un collier de perles de 5 millions*" becomes fragmented and twisted, with the main element in the scene being the "O" which is put in motion and multiplied, thus associating it with a pearl necklace, with zeros in "5 millions" as well as with the vowel "o" dominating the sound of the text. The repetition of these elements opens up many possible combinations between them. Similar to this

sensational headline becoming a movable thing, Man Ray's Emak-Bakia (1926), presents an electric advertising text in motion, shining in the dark. It is used as a material element that supports the motif of rotating and recurring luminous lines, which characterizes the film. Here words, to paraphrase Mallarmé, are transposed into their "almost vibratory disappearance."[72]

The image basically ceases to function as the silent repetition of things or as a mute gesture. As we have seen in Freud's case, the moving image becomes the potential to consider psychic reality and make sense of it through the various models as well as through its figural expressions. In Mallarmé, meanwhile, the moving image organizes the "simultaneous vision" of words and the page as subject to repetitions and differentiations similar to what occurs in cinematic editing. Mallarmé's and Freud's figural intervals have in common the fact that space gives rise to temporality, gesture to thought, embodying the moving image's capacity to generate sense. Thus these intervals suggest how the demarcations that were made at the birth of aesthetics, most notably in Gotthold Lessing's Laocoon, between the arts based on succession and those based on simultaneity, (spoken) word and image, *logos* and unarticulated or automatic gesture, has been radically challenged.[73] Cinema renders this separation obsolete by letting the present (succession) and the past (simultaneity) converge in its compositions as if in a single toss. We have witnessed this kind of a composition in Perret's Kador in which the cinema's emergence as potential memory and thought process is rendered visual through a complex film-within-film scene, which underlines temporal repetition as a mode of psychic differentiation. The image expands from resembling and simply repeating with cinematic rhythms that open up to thought instead of prolonging action according to sensorimotor schemata.

This problematic can also be compared to René Magritte's painting *Ceci n'est pas une pipe* (1926), in which propositional thought again becomes confused with the image in a visual paradox of sorts. Following Foucault's analysis, linguistic formulation in this painting, is no longer capable of stopping the so-called silent and unconscious repetition of the visible. Words cease to designate and affirm, and hence stop separating themselves from the image, whereas the image itself seems to acquire a certain capacity not only to reproduce or imitate but also to differentiate. Foucault wrote that there is "an absence of space, an erasure of 'common ground' between the signs of writing and the lines of the image."[74] The shifter "this" ("ceci") in particular loses its capacity to signify and capture the image under its reference. This is due to the fact that, as Magritte puts it, "'[a] word can take the place of an object in reality. An image can take the place of a word in a proposition'."[75] Magritte's painting thus epitomizes an aesthetic, epistemological and ontological change that David Rodowick – following Foucault's views but also rearticulating a concept of François Lyotard's

– approaches in terms of the figural.[76] For Rodowick, the concept of the figural characterizes the status of the image in cinematic modernity, especially as regards the intimate relation between the image and thinking. By definition, the figural is neither an actual figure nor even figurative. First, by abolishing the self-identity of both the linguistic *énoncé* and the image, it marks a confusion between them. The figural is the "para-doxic" force of this confusion and thus its transgression. It is a potential matrix for the emergence of disjunctive relations between the image and the word. This relation does not follow a collateral logic according to which linguistic signs, through reference and differentiation, would encircle the unintelligible repetition of the image. In contrast, the "mute repetition" of the visual itself becomes intelligible; it "speaks," imagines, thinks – differentiates.[77] Furthermore, it should be noticed that not only the status of the word but also that of the image becomes problematic. It cannot be a question of a self-identical, unitary image but, instead, of a dynamic, moving image that acquires a certain non-linear and differential temporality. This kind of image is not straightforwardly visible; it does not surrender itself to actual sensation. Rather, it is "anesthetic" in that it is potentially given in the intervals between image and text, image and image, text and text. Rodowick argues that "the figural has exploded, fragmented, and accelerated regimes of visibility," whereby it unfolds a specific realm of the virtual.[78]

It is precisely this kind of virtual realm or the potential embodied by the anesthetic and amnesic white screen in Le mystère des roches de Kador, which leads to a rupture in vision that breaks the surface of the image and exposes noetic linkages and the depths of memory. This kind of visuality also shapes Freud's making sense of the psyche, with the moving image as its paradoxical, genetic element. As such, the figural logic of Freud's thought is also manifested in a few concepts with which psychic reality is given consistency. A case in point is the concept of dream-work (*Traumarbeit*), which is composed of elements that are both non-linguistic and imperceptible. For Freud, the dream-work "does not think, calculate, or judge" but gives "things a new form."[79] Its primary function is to de-form (*Unformen*), to transgress and to instigate new potential connections between series of words and images, for example. Hence, the concept supposes a type of figural sense-making.[80] The notion of the dream-work is closely connected to another crucial concept: fantasy. In an 1897 letter to Wilhelm Fliess, Freud already recognized that childhood memories, e.g., seduction scenes, which emerge to the surface in adulthood, do not necessarily have a point of reference to actual events in the past; "there are no indications of reality in the unconscious."[81] The unconscious becomes the "non-locality" of fantasy production, whereas the very concept of fantasy posits itself outside of the empirical determinations between subjectivity and objectivity, the imaginary and the real:

> The strangest characteristic of unconscious (repressed) processes... is due to their entire disregard of reality-testing; they equate reality of thought with external actuality, and wishes with their fulfillment... Hence also the difficulty of distinguishing unconscious phantasies from memories which have become unconscious.[82]

This is how the concept of fantasy implements the zones of indistinction produced by the moving image between the subject and the object like in the scene in Kador (revealing the confusion between memory and the cinematographic image) or the imaginary and the real like in the scene between Balduin and his double. Furthermore, the concept emerges from envisioning the kind of specific temporality outlined above, based on a repetition of the past in the present, one that structurally connects Freud's ideas to the moving image.

Thus, as Gilles Deleuze and Félix Guattari point out, what psychoanalysis initially mobilized was a domain of psychic potentiality, free and non-exclusive syntheses, unlimited and even paradoxical connections, between words and images or the present and the past, for instance[83] – a psychic reality that, in its epistemology, emerges from the moving image that encompasses a certain sphere of sense and thinkability. On the other hand, however, Freud's psychoanalysis also exhibits the locking of this domain of potentialities into a single static system. This no longer means the referential framework of neurophysiological modulation but concerns, instead, to quote Deleuze, an interpretive machine that operates by fixing individual expressions within the referential axis of the Oedipus complex and the family triangle that pierce through the psyche and its development.[84] Everything, according to psychoanalysis, can be translated via this system, and ultimately nothing escapes it. Fantasies, for example, which are manifested in numerous figural displacements, are arrested in the ultimate signified which is the Oedipus; it is only Oedipus who can ultimately decipher psychic reality. This aspect of Freud's epistemology follows what can be called the logic of the "symbol" rather than the paradox-image, which is an unconscious element of sense that Freud himself remained quite unaware of, while the former becomes a referential point of more or less self-conscious steps of interpretation and evinces a mode of symbolic reasoning. Whereas the paradox-image concerns potentiality or a tendency of thought, symbolic reasoning applies to certain logical and interpretive procedures of actual acts of thinking. One can note that there is no direct correlation between the two in Freud because the interpretive machine stems from directions and tendencies other than the paradox-image.[85]

To summarize, the moving image consists of a logic of sense that follows certain aspects of Freud's thinking. Freud may indeed be right in proposing that psychoanalytic "abstractions" cannot be found in any actual image – perhaps they do not reveal themselves to the eyes – but his very conception of the psy-

chic reality as something inaccessible to the senses would nonetheless not have taken place without a certain intelligibility, one that, as we have seen, is partially determined by the moving image. In Freud's case, thinking, the creation of concepts, becomes intimately related to the moving image. Concepts, however, cannot be directly deduced from their epistemological and ontological presuppositions.[86] In other words, psychoanalytic concepts have no logical or causal connection to the moving image. Psychoanalytic concepts are not about the moving image but their formation is partially directed by it. The moving image embraces the potentiality to create those concepts. Thus, with the case history of Freud, we can see how the moving image directs and differentiates the orientations of thought by emerging as the very capacity to think. Generally speaking, with the moving image, a sphere of sense and thinkability arises where new concepts of the world and ourselves become generated in an intimate conjunction with the rhythms of the new time-based medium.

5 Differential Image: Abyss of Time

The Bridge

As for the questions concerning the moving image, time and thought that were addressed in the previous chapter, Joris Ivens's film The Bridge (*De Brug*, 1928) presents a striking example of how the cinema patterns noetic movement, and embodies a mode of visual disclosure and differentiation. The film is an experimental "close study" of a railway lift bridge in Rotterdam. The bridge is a massive, mechanical steel structure from the industrial age located at crossroads of other mechanical machines, with trains crossing it and ships passing under it. The film, which from several perspectives studies the the visual and kinetic aspects of this construction, is organized around a very simple narrative: a freight train approaches the lift bridge, which is about to be raised to let ships pass underneath; and finally, the bridge closes and the train passes over the bridge. However, criss-crossing this horizontal sequence of events is a kinetic dynamics particular to the bridge: the vertical movement of the bridge being raised and lowered. It is this repetitive action that Ivens's film scrutinizes. It focuses on this movement from various angles with canted frames from atop the towers and from under the bridge. It follows the visual dynamics of the processes involved in the bridge's mechanics – for example, the interaction of forms as they unite and separate, the forces and rhythms of the bridge's moving parts, kinetic contrasts between one element moving up and the other element moving down, or the texture of the iron surface as sunlight hits it. Rather than the gathering of certain occurrences (train approaching, bridge raising) into a linear order, what The Bridge presents with this kinetic and "kaleidoscopic" scrutiny is the repetition of the bridge's visual elements and rhythms, a repetition that points to an operation of abstraction. The final shot of The Bridge underlines this by showing a black square growing larger and smaller on a white background. One could say that in the film, the bridge becomes analyzed into certain singularities or tendencies of movement (up/down) that constitute its processual nature. In this respect, the film is not merely to depict a particular object in its appearance from a single viewpoint but to bring about a simultaneous differential view of

the forces that compose the bridge relating to its movements, rhythms, shapes, and so on.

Ivens himself explains that:

> For me the bridge was a laboratory of movements, tones, shapes, contrasts, rhythms and the relations between all these. I knew thousands of variations were possible and here was my chance to work out basic elements in these variations… What I wanted was to find some general rules, laws of continuity of movement.[1]

Ivens stresses the role of camera work in this regard, but what is equally important in achieving the type of differential view is editing by which the film juxtaposes forces and rhythms into a temporal constellation based on repetition. The editing of The Bridge composes a very unique kind of presentation of its object: it doubles the bridge into its particular spatiotemporal instantiations, on the one side, and kinetic potentialities or "laws of continuity of movement", on the other. Thus it visually articulates a mode of ontico-ontological differentiation, one according to which the lift bridge is divided into two halves, its particular instantiations and differential elements and rhythms. The Bridge probes the moving image's temporally oriented morphogenetic capacities through repetition to differentiate the bridge according to its singular traits. The film produces a "*differential image*" that reveals the forces and rhythms constitutive of the bridge.

Ivens's film presents images capable of differentiation through temporal repetition, embodying a particular type of thought process as well. The question here concerns the nature of this repetition as well as the "differential" image achieved, that is, the ontological problem of the repetition of the same and of identity over time. Does the The Bridge reveal a self-identical form of the bridge that persists and "recurs" as time passes by via its repetitive patterns? The answer is not that easy. Even though the film begins with a layout of the bridge's structure, it ends with abstracted rhythmic tendencies that suggest something else, namely that the process of differentiation proceeds from recognizable forms and models to singular traits without a definite shape. The overall view of its object that the film generates concerns potentialities, and The Bridge hints at the ontological and epistemological problem in its aesthetics that inquires: How do things become constituted and how do we get to know their constitution?

In contemporary thought, Gilles Deleuze has systematically articulated several modes of time and repetition that relate to this problem.[2] The first mode that Deleuze proposes is a temporality based on habit, which constitutes the living present, with the past and the future as its relative dimensions, and embodies a temporal direction as an arrow. This is a synthesis of time that operates by contracting successive instants into a present. However, according to De-

leuze, this kind of synthesis does not yet imply the understanding and representation of what happens, that is to say, the generalization or "active synthesis" of particular moments. Instead, representation involves the reproduction of the past in the present and reflection on the present itself, which is a kind of operation that is based on a second mode of time. To put it bluntly, this mode concerns time as an *a priori* form imposed over things. The synthesis it involves, which Deleuze relates to Immanuel Kant, among others, applies not to a present but to a past that has never been present, since it extracts from the repetition of successive instants a generalized form that has never existed (as present) before this operation. Things are then apprehended with respect to a whole. This temporality is the repetition of a whole, which makes it possible to identify things according to this general form.

In chapter 3 we saw how the moving image mobilized the first mode of time, the temporality of a lived present, concerning how the cinema modulates our sensorimotor being and gives rise to an *Umwelt* of habitual life. This, however, is obviously not the goal of the aesthetics in The Bridge. On the other hand, although less obviously, the film also seems to impugn the operation of representation that characterizes the active synthesis of time. This is because the differential view, the virtual image of simultaneous potentialities, disclosed in the film is not the same as a self-identical representation of its object. The film's repetition does not follow a distinct pattern and, unlike the ubiquitous perception brought about by the parallel editing, for instance, it does not assign an established meaning and quality to its object from a relatively fixed perspective. Rather, The Bridge builds upon the multiplication of perspectives of its object – and the film's perception of temporality is of another kind.

How can we characterize the film's repetition formula and its consequent mode of differentiation? In addition to the two syntheses mentioned above, Deleuze also distinguishes a temporality that excludes the notions of both succession and the whole, one that relates not to a passing present or an *a priori* form of time but the coexistence of disparate elements as virtual tendencies that direct the world's actualization, converging thus with the kind of vision The Bridge embodies.[3] During the period of the emergence of the moving image, this temporality, and also with respect to the image problematics, became theorized in Friedrich Nietzsche's perspectivist thinking, especially in his notion of the eternal return. For Nietzsche, time becomes a question of creation and epistemology, a question of multiple perspectives. The differential perception and dynamic visuality that the moving image may give rise to, as The Bridge exemplifies, is linked to developments in philosophy at the turn of the twentieth century, and in the following sections we shall explore how the moving image relates to the problematic of ontological knowledge and time as it manifested in

Nietzsche's ideas, also including larger developments in Western visual culture into our discussion.

Schein

In his lectures on Nietzsche, Martin Heidegger focuses on the concept of the image while he approaches the question of knowledge in Western thought.[4] For the Greeks, Heidegger maintained, both the image and knowledge embraced a certain mode of activity concerning the world's immanent "coming to presence" in thought. In modernity, however, this kind of understanding of the image and knowledge is transformed into a logic of representation. The modern position is exemplified by Immanuel Kant's world of appearances where there is no necessary or discernible connection between the self-referential symbolic realm and other realities outside of it. Nietzsche's ideas emerged as a critical response to this position. Heidegger characterized Nietzsche's philosophy in this development as an attempt to overturn the modern position by approximating the ancient one, although not in a simple and direct manner but in terms of a "completion of Western thought."[5]

What is essential for our purposes is how the image – and its ontological force in particular – becomes perceived in Nietzsche's project of "overturning" Western metaphysics. As we will see, the overturning is intimately entwined with the dynamic visuality of moving images. It is through developing a notion of a "differential image" as an alternative to the image based on identity and representation that Nietzsche in fact radically challenged traditional ideas of truth and being. Firstly, Nietzsche's concept of *Schein* includes a specific notion of the moving image while, secondly, this notion also functions as a core element in the concepts of the eternal return and will to power.

Outlining a certain epistemological position from which the notions of truth and being lose their gravity and weight, Nietzsche's Zarathustra speaks: "This world, the eternally imperfect, the mirror image and imperfect image of an eternal contradiction – a drunken joy to its imperfect creator: thus the world once seemed to me."[6] Zarathustra highlights how the world "is" in the image, although not in any preconceived form but in an image that is incomplete, in progress, like the one in a mirror that reflects the movements of "eternal contradiction." A few lines earlier, Zarathustra stated: "then the world seemed a dream to me and the fiction of a god."[7] The fact that the world is created in an image suggests that it is given only through, and as, semblance (*Schein*).[8] The image for Nietzsche is first of all characterized in terms of semblance; the image "seems" (*scheinen*).[9] Moreover, in a fragment from the time Nietzsche was

working on the final sections of *Zarathustra* we read how a "poetic force" (*dichtende Kraft*) creates the world of being.[10] This force works with images (*Bild*) that produce something that is ready-made and frames it as permanent. The world of stable identities, the world of being, of subjects and objects, is an effect of semblancy (*Scheinbarkeit*).

What is *Schein*? In *The Gay Science* Nietzsche defined it as follows:

> Certainly not the opposite of some essence...! Certainly not a dead mask that one could put on an unknown x and probably also take off x! To me, semblance is the active and living itself, which goes so far in its self-mockery that it makes me feel that there is semblance and a will-o'-the-wisp and a dance of spirits and nothing else...[11]

Schein in this passage is described as that which seems to be a given, that is, no less than reality itself, since even essence becomes assimilated into semblancy. Semblance, then, is not opposed to reality. It *is* reality as we perceive and know it in terms of causality, necessity, and substance, for example. Therefore, no "thing-in-itself" or absolute truth can be considered the foundation for ontology and morality beyond semblance. For Nietzsche, the question is nonetheless not about sinking into a world of appearances. Semblancy is a strategic concept aimed at stripping being of its privileged ontological status: "'Semblancy' itself belongs to reality: it is a form of its being..."[12] This is a fundamental notion in Nietzsche, and it forms the core of his attempt to approach the world in terms that exceed the logic of subject and object, appearance and the thing-in-itself or essence.

Nietzsche thought that *Schein* primarily concerned our ability to live. The fact that the world reveals itself to be permanent, identical and coherent is a matter of our "practical instincts." Obviously, Nietzsche's thinking in this respect overlaps with contemporary developments in physiology (see chapter 1). A stable point of reference has vanished and what remains are types of simulations of the world. Semblance is about afterimages appearing when we close our eyes, ones that in Nietzsche's early work are termed Apollonian visions according to the god of the sun and light that projects the world of semblancy. As we argued earlier, the study of these entoptical phenomena in nineteenth-century physiology actually implemented a conception of the constructional nature of human perception. Like Johannes Müller and Hermann von Helmholtz, Nietzsche considered perception to be mediated by two systems of arbitrary signs or "metaphors" in terms of transportations or transpositions from one register to another.[13] First of all, there is the transposition of a nervous impulse into a sensory image and, second, there is the transposition of the sensory image into a word. Consequently, it appears that there is no immediate perception, no "pure, inconsequential truths" beyond semblancy, that is, the images and words

generated by our nervous apparatus and consciousness.[14] *Schein* thus shows how perception and consciousness are always less than the world as such.

One could even say that the notion of semblancy is implemented by technologically produced moving images generated during the above-mentioned physiological experiments. As Friedrich Kittler argues, the images of light in Nietzsche's concept of Apollonian art "have little to do with productions of Sophocles at Athenian festivals" but instead describe "the technological medium of film, which the Lumière brothers would make public on December 28, 1895."[15] In Kittler's treatment, it is generally the "discourse network" of our technological modernity, produced by the media of automatic (re)production, that feeds into Nietzsche's thinking at the threshold of Western thought when metaphysical suppositions of being, truth and consciousness become undermined. Taking up Kittler's argument, we see how the notion of *Schein* is embedded in the biopolitical context of cinematic modernity, where these kinds of suppositions matter very little anymore and subjectivity in particular becomes identical to quasi-endogenous appearances modulated by the moving image. In *Human, All Too Human* Nietzsche even adopts some of the principal ideas of nineteenth-century physiological research into his notions of visual perception, describing how "the brain produces a host of light-impressions and colours, probably as a kind of after-play and echo of those effects of light which crowd upon it during the day."[16] More precisely, Nietzsche's notion of semblancy anticipates the automation of movement in cinema. Incapable of processing the stimuli that succeed too rapidly in a film, the brain needs to resort to generating an appearance of a continuum, endogenous *Schein* or an *Umwelt*. The brain unconsciously organizes random data, as Nietzsche described it, "into definite figures, shapes, landscapes, moving groups. What is actually occurring is again a kind of inferring of the cause from the effect; the mind asks where these light-impressions and colors come from and supposes these shapes and figures as their causes..."[17] The "metaphoricity" of the nervous apparatus and consciousness undermines the representational logic that posits an economy of exchange between an inside image and the outside world. It suggests how the brain, or the screen, is the image and the source of light itself illuminating the world of stable beings.

What Nietzsche brings to the discourses of cinematic modernity is perspectivism, which the concept of *Schein* incorporates. Semblancy gathers incongruent perspectival relations and so the world "seems" different from a given perspective that perceives and interprets it in a unique manner. The world has a relatively different face from each point of view, and it subsists and varies according to the point of view. However, what seems somehow different from the world of *Schein* is the reality of becoming, which Nietzsche describes as "the formless unformulable world of the chaos of sensations – *another kind* of phe-

nomenal world, a kind 'unknowable' for us..."[18] Nietzsche insisted that a chaotic, not yet individuated world of movement of things themselves, so to speak, surpasses the (human) world of *Schein* generated by the limitedness of perception and consciousness. In this sense, in Nietzsche's philosophy, a fundamental epistemological problem is focused on how to conceive of this world of becoming that seems to remain unknowable for us. This problem evolves into a concern of how not to stay within the limits of the senses as well as language. For example, how to exceed the mechanistic conception of motion produced by the basic semiotics of the sign language of sight and touch and based on abstractions such as necessity and cause and effect?[19] How should one step beyond the habits of language that encapsulate the world into the notion of substance? Nietzsche does not remain within the notion of *Schein* – a concept that uncovers the contingency of our so-called metaphysical truths – but also, one could say, tries to think beyond it, to think of the contingency itself.

Nietzsche's critical potential here regarding the biopolitical captivation of being in cinematic *Umwelt*s also comes up. This concerns how an alternative conception of the moving image emerges from Nietzsche's thinking, one that is closely associated with his concept of the will to power that is directed toward surpassing the human condition. Considering the world of the will to power as something that is plotted out by the brain and the senses, Nietzsche observed:

> The mechanistic world is imagined as only sight and touch imagine a world (as "moved") – so as to be calculable – thus causal unities are invented, "things" (atoms) whose effect remains constant (– transference of the false concept of subject to the concept of the atom).
>
> The following are therefore phenomenal: the injection of the concept of number, the concept of the thing, (concept of the subject), the concept of activity (separation of cause from effect), the concept of motion (sight and touch): our eye and our psychology are still part of it.
>
> If we eliminate these additions, no things remain but only dynamic quanta, in a relation of tension to all other dynamic quanta: their essence lies in their relation to all other dynamic quanta: their essence lies in their relation to all other quanta, in their "effect" upon the same. The will to power not a being, not a becoming, but a *pathos* – the most elemental fact from which becoming and effecting first emerge.[20]

The will to power is the auto-affecting and self-differing "one," an internal principle, which operates within the multiplicity of the individuated force points and semblance. In Deleuze's interpretation, the will to power can be seen as the differential element that determines the relations of forces (quantity) as well as the qualities of forces (e.g., subject or object, good or bad) in a relation.[21] Nietzsche believed that the will to power presented the world as something "seen from inside," from its inner creative activity, "the world determined and

described with respect to its 'intelligible character'."[22] To think of the world from the viewpoint of the will to power is to think of it in terms of its internal genesis, according to the immanent, creative, and asubjective or pre-individual principle that generates perceptual conditions and thus creates the world of *Schein*.[23] Nietzsche affirmed that unlike Apollonian semblances, this is the world of creative Dionysian *Rausch* and eternal repetition:

> This world: a monster of energy, without beginning, without end; a firm, iron magnitude of force that does not grow bigger or smaller, that does not expend itself but only transforms itself;... at the same time one and many, increasing here and at the same time decreasing there;... this, my *Dionysian* world of the eternally self-creating, the eternally self-destroying... *This is the will to power*...[24]

The contrast between Apollonian forms and Dionysian *Rausch* can be seen as discovering its justification in the contemporary emergence of the moving image and the tensions this effects in our perception and understanding of movement and temporality.[25] As Ivens's The Bridge epitomizes, cinematic perception does not simply rest on representations and the phenomenal; it can also break through the surface of objects, so to speak, and in its machinic vision, differentiate the world according to its constitutive forces. Analogously to this intensive movement of the image in The Bridge, movement, for Nietzsche, cannot be understood in terms of covering a distance and cause and effect, but rather in temporal terms as the unfolding of forces and the generation of forms. Indeed, Nietzsche argues that "[e]very movement should be conceived as a gesture, a kind of language in which forces make themselves understandable."[26] At the turn of the twentieth century, as Ivens's The Bridge suggests, the moving image was the medium that implemented this silent "language" of gestures in its aesthetics, which, for Nietzsche, would render the world of forces intelligible and present the perspective of the will to power. This kind of understanding of the visual is already affirmed in *The Birth of Tragedy*, although somewhat hesitantly. In *Birth*, the perception or perspective of the will to power is linked to a moving, dynamic image. Nietzsche speculated that if the visual power or faculty (*Sehkraft*) "were not merely a power to attend surfaces, but as if it were capable of penetrating to the interior," then we would be capable of seeing "the undulations of the Will, the conflict of motives, and the swelling current of passions in a sensuously visible form, so to speak, like a multitude of vividly moving lines and figures..."[27]

Imposition and Gramma

In Nietzsche, the moving image is articulated via a certain mode of perception, namely, the inner perspective of the will to power. Consequently, the moving image becomes associated with particular noetic activity that exceeds semblance and the representation of the world as something uniform. Nietzsche characterizes this process of thinking as:

> To impose [*aufzuprägen*] upon becoming the character of being – that is the supreme will to power.
>
> Twofold falsification, on the part of the senses and of the spirit, to preserve a world of that which is, which abides, which is equivalent etc.
>
> That *everything recurs* is the closest *approximation of a world of becoming to a world of being*...[28]

Will to power, the affirmation of being and becoming, suggests a "twofold falsification" concerning the senses and the spirit (or language). First of all, regarding this falsification, the key term is "to impose" (*aufprägen*) or "imposition" (*Aufprägung*) – how the *character* of being is "traced" onto becoming. What does it mean to impose?

Here imposition, as Heidegger notes, is basically characterized as the act of knowing: "Knowing means imposing [*aufprägen*] regulating forms on chaos."[29] Chaos or becoming, Heidegger pointed out, implies some sort of motion of which the principle is not immediately revealed through experience, but, at the same time, it is not conceived as an "arbitrary jumble" or something that is simply unordered. Instead, "chaos is what urges, flows, and is animated, whose order is *concealed*, whose law we do not descry straightaway."[30] One could say that chaos becomes known only when it is mediated through an imposition, where this mediation, to follow Heidegger, is understood as that which lets becoming appear as something enduring. The supreme will to power, or its "most *profound* essence," Heidegger writes, is "nothing other than the permanentizing of Becoming into presence."[31]

However, a question remains concerning the event of imposing: is becoming the original but passive "given," which precedes and also exceeds imposition in the sense that the latter ("phenomenon") is what actually gives the former ("noumenon") its veritable form? This view seems untenable, not least of all because, as Heidegger himself noted, chaos is auto-affecting, and marked by self-creation and self-destruction.[32] Chaos doesn't only simply retain passivity but also original activity – its own "law" or *logos* – and the gesture of imposition must somehow redeem or restore this activity by bringing it into the field of knowledge and thought. Nietzsche wrote that it does not commence with chaos

and then thereafter move toward the harmonious and finite, circular movement of forces; instead, "everything is eternal, not-become [*ungeworden*]... The circulation has not become [*Der Kreislauf ist nichts Gewordenes*], it is the original law, *Urgesetz*... All becoming is inside the circulation."[33] That is to say, being (*Kreis*) and becoming (*Chaos*) are by no means opposed to each other in terms of contradiction and mutual exclusion.[34] Firstly, there is no being outside becoming. The latter possesses its own law, its own imposition, from which being itself is born. Secondly, there is no becoming as anything originally given; instead, becoming "is" only in the event of imposing, in other words, the imposition is the being of becoming.

Nietzsche articulated here the problem of ontogenesis, which concerns how being equals a process of emergence predicated upon temporal recurrence. Moreover, implying some kind of mediation and form-giving activity, the notion of imposition relates to the problematic of how one can, through delicate gestures, entertain this complex idea in thought. We have focused on the ontological side of this problematic because it also foreshadows the potentialities of cinematic expression and thinking. As for the moving image's role in these arrangements, let us note at this point that the problematic that guided Nietzsche's thinking entails a mode of visuality that is similar to the notion of the differential image – not an image "of" becoming but an image that becomes in the sense that it affirms becoming, lets becoming impose itself on the image and thus generate being. Giorgio Agamben perceptively pointed this out by arguing that the paradox inherent in Nietzsche – and especially his notion of the eternal return, which shall be dealt with later – focuses on a very singular conception of the image. Agamben writes that this is "an image that precedes both that of which it is an image and that on which it impresses itself [*s'imprime*]. Not only does the thought of the eternal return contain... an image, but... this image is the original which precedes being and becoming, subject and object."[35]

That kind of differential image cannot concern the subject-object optics and figure-ground relations that characterize Apollonian, already individuated semblances. In a fragment from the autumn of 1885, Nietzsche, who struggling against the ocularcentric tradition of Western philosophy that postulates that so-called natural vision forms the centre of thought and knowledge, speculated on how there "must have been thinking long before there were eyes."[36] He associated this kind of more "original" thought with the sense of touch and sensations of pressure. In this respect, Nietzsche's thinking shifts our focus to the larger late-nineteenth-century media ecology and especially the new typewriter technology. In 1882, Nietzsche began to work on his will to power project, despite being half-blind, or as the diagnosis in 1878 noted, his right eye was only able to see "misshapen and distorted images" and "letters that were virtually beyond recognition,"[37] and he decided to buy a "Malling Hansen writing ball"

(a type of typewriter) from Denmark. The reason was that this machine allowed one to compose "blindly" based more on tactility than on sight, since, according to its technical specifications, what was written only became visible after writing it down, while the act itself depended on the sense of touch.[38] The typewriter allowed the act of writing to be guided by the spatial positioning of the keys on the semi-spheric keyboard, and so writing is primarily dependent on the spatial and/or differential relations between signs. On the other hand, as Kittler observes, "spatiality determines not only the relations among signs but also their relation to the empty ground. Type hits paper, leaving an impression, or sometimes even a hole."[39]

Generally speaking, as Kittler suggests, the typewriter technologically implements a "logic of chaos and intervals" resulting in a conception of language that can no longer be based on the translation of a prelinguistic meaning but, instead, boils down to the materiality of the writing act.[40] The typewriter dissects words into discontinuous material signifiers that depend on the machinic act of impression in which forms emerge from the empty paper's virtual chaos. This is related to Nietzsche's notion of imposition, which attempts to "unground" our ontological presuppositions. The notion of imposition struggles to think of the material world of chaos and becoming as immanently form-giving itself, instead of presupposing the "mind," "god" or "substance" as the origin of forms. This echoes the problem of the figural that becomes manifest, as we have seen in the previous chapter, with the emergence of the moving image: the imposition must break with the traditional logic of the sign, which is based on the duality between the signifier or appearance and the signified or essence.[41] In this respect, Nietzsche's goal was to articulate a novel ontology, which was, to some extent, implied by the scene with the typewriter and the tactile gestures it embodies. As Nietzsche typed in a letter in 1882: "*SIE HABEN RECHT – UNSER SCHREIBZEUG ARBEITET MIT AN UNSEREN GEDANKEN*" (You are right, our writing tools are working on our thoughts).[42]

Christof Windgätter analyzed that the typewriter determines Nietzsche's thinking in terms of how discontinuity is manifested in the philosopher's later understanding of language and style of writing.[43] According to Windgätter, Nietzsche's style is primarily typographically oriented. His frequent use of quotation marks highlights the heterogeneity of writing, presenting what is written as such and drawing attention to the written characters themselves. Quotation marks in a way create the image of a text as text. On the other hand, the space between words and letters comes into focus as it is set apart by the dash (–) that breaks the flow of reading, builds oppositions or leaves a sentence to vacillate in the empty space. Windgätter points out that the dash is thus a sign "not *of* but *as* difference."[44] It, one could tentatively say, functions like a differential image, similar to a silent interval that renders the fluctuating, intensive reality of the

eternal return intelligible, to silence that, as we shall see, is basically a very unique type of showing. Pierre Klossowski also emphasizes the interval in his analysis of Nietzsche's "semiotic of impulses," paying special attention to a specific type of visuality in his writing:

> The intensity oscillates while thought as such is being formed, but once the declaration is produced, it is reduced to the inertia of signs. Where then does the ebbing flow of the intensity go? It overflows the fixity of signs and continues on, as it were, in their intervals: each interval (thus each silence) belongs (outside the linkage of signs) to the fluctuations of an impulsive reality.[45]

As for the discontinuity in language itself, what this recourse to the materiality of writing shows is a struggle to strip language of its semantic content and the functions of nomination, and primarily to disclose its artificiality and expose its limits as limits. Nietzsche wrote:

> Now we read disharmonies and problems into things because we think *only* in the form of language – and thus believe in the "eternal truth" of "reason"... *We cease to think when we refuse to do so under the constraint of language*; we barely reach the doubt that sees this limitation as limitation.[46]

Moreover, while downgrading the validity of our grammatical categories and the linguistic form of thinking, dashes, quotation marks, the telegraphic style, etc., simultaneously reveal how language essentially implies its own exteriority. The materiality of writing seeks to carve out from within language that which has no name, that which remains necessarily unwritten, whereas under the pressure of the outside, thinking is freed from the chains of grammar and logic as well as subjective interiority.

Not surprisingly, the key notions of Nietzsche's philosophy such as the will to power or the eternal return are seldom directly described in his books or fragments. That is because the exploration of the limits of language in fact functions at the core of the thought of the eternal return. One could say that it is the outside of language that determines Nietzsche's "most abysmal thought."[47] While Zarathustra, after seven days of silence, remarks the artificiality of words – "It is a beautiful folly, speaking: with it humans dance over all things" – the animals utter:

> – "Oh Zarathustra," said the animals then. "To those who think as we do, all things themselves approach dancing; they come and reach out their hands and laugh and retreat – and come back.
>
> Everything goes, everything comes back; the wheel of being rolls eternally. Everything dies, everything blossoms again, the year of being runs eternally...
>
> In every Instant being begins; around every Here rolls the ball There. The middle is everywhere. Crooked is the path of eternity."[48]

Here we witness a recurrent theme in Nietzsche's thinking of the eternal return, which concerns how language must stop functioning as a signifying proposition and denoting things and trapping things within its framework. As is well known, Nietzsche experimented in his writing with several techniques and forms such as the aphorism and the Dionysus dithyramb in order to find a mode of expression that would not simply signify, denote and objectify but would also be capable of manifesting that which is not a "thing" and has no specific name, the dance or *Rausch* of things themselves. For Nietzsche, the aphoristic form "speaks about things the likes of which have never been heard. Sayings trembling with passion; eloquence becomes music; bold strokes of lightning hurled forward into futures never before anticipated."[49]

The thought of the eternal return, then, is intimately implied in the experiments that focus on alternative linguistic expression and deal with the question of how we can conceive of the outside of language (inside language), its bare exteriority denuded of the signifying and nominating functions – the dash that thinks without words, as it were. It should be noted that the outside is not simply a place of negativity, but Nietzsche's notion of imposition is directed toward affirming it in positive terms through gestures that are perhaps silent and tactile but also visual in a very particular way.

Nietzsche's search resembles that of Stéphane Mallarmé in his *Un coup de dés jamais n'abolira le hazard* in which the typographic position of writing signs boils down to signs becoming moving images, space generating temporal forms and figures similar to cinema. In Mallarmé's case, it seems that the moving image enveloped the outside of language, embodying a temporality in which chance or contingency and necessity are intertwined and actually tend to merge with one another. In its cinematically informed visual compositions of material signifiers, which rest on combinatory montage techniques that occur between various linguistic elements, the poem enacts a configuration of repetition and differentiation that converges with Nietzsche's notion of eternal return and the problematic of being and becoming that it implies. However, it is also here that a fundamental disparity between Nietzsche and Mallarmé appears. Mallarmé believed that chance and necessity basically stood in fundamental opposition to one another.[50] Chance instantiates worldly existence, while necessity, by contrast, is the character of the "pure idea" or the eternal essence, and it is only through the annulling of chance, becoming and contingency that the eternal can be affirmed. In *Un coup de dés*, Mallarmé's "nihilistic" view (in Nietzschean terms) of this totality finds its ultimate sign, not in the cinematic figures that the poem enacts, which incorporate the dimension of contingency, but in the "Septentrion" that emerges toward the end. Septentrion means the seven stars of the constellation of the Great Bear. In *Un coup de dés*, it crystallizes the perfect form, the cosmic constellation in which contingency is eliminated and thought finds

its endpoint.[51] In terms of media studies, the Septentrion unites the image, the numeral and the letter under one sign or symbol.[52] It is thus the ultimate sign, which combines the basic forms of human knowledge and beyond it there is only a place of pure negativity.

In the history of philosophy, this type of sign resembles the notion of the *gramma* – a "letter" or, more generally, a "scratch" – that Aristotle introduced into Western thought at the beginning of *De interpretatione*.[53] It is important at this point to unravel this background a bit further, because it is precisely the Aristotelian *gramma*, and consequently certain key assumptions of Western metaphysics, that Nietzsche's notion of imposition sought to challenge. Aristotle believed that the *gramma* was the final indivisible element by which voice acquires the capacity for articulate speech and signification, in other words, the very possibility of engaging in human thought. Signs of writing make it possible to analyze and divide speech as well as thought into its constituent alphabetic elements, whereby the *gramma* becomes the primary element, the absolute presupposition, upon which thinking is based. In this way, the *gramma*, according to Agamben, actually forms the linguistic cipher of Aristotle's ontological notion of the first substance, *protē ousia*, which is by nature totally actual (lacking potentiality), self-identical, eternal and necessary.[54] The substance functions as the fixed ground of being that remains unaltered with respect to the changes which beings may be subjected to. As such, the first substance is something that remains outside the reach of language and thought and yet is always already presupposed. It manifests itself as the negative ground that can be included in discourse not in terms of immanent positivity but only "after the fact." Fundamentally, then, in the history of Western thinking, the *gramma* is what mediates a particular sphere of negativity and a logic of substance and necessity.

Shifting the attention from the materiality of letters to moving images, one should note that at the turn of the twentieth century this logic of *gramma* was considered in a unique manner in pictorial terms in the work of the Estonian linguist Jacob Lintsbach. In his book *The Principles of Philosophical Language: An Attempt at Exact Linguistics* (1916) Lintsbach assumed the task of producing an artificial universal language based not on the phonetic principle taken from so-called natural languages but on what he called "living schemes," "the cinematograph of icons" or the "manual language of the mind" including body language, music and moving pictures in particular.[55] Lintsbach considered that the "mechanical language" of the cinematographic image is a faithful registration of reality not based on convention, which "must lay at the foundation of a more concise [universal] language, based on conventional signs."[56] However, the universal language does not concern physical cinema or a cinema based on photography, but a cinema of discrete icons that would demonstrate "the life of our ideas." Icons are the elements of mental ideas, and when a strip of icons is ani-

mated at the rate of seven images per second – the speed of human thinking according to Lintsbach – an immediate visualization of mental processes is achieved. Even logical relations appear to be better expressed in the new language of thought. "Abstract notions," Lintsbach writes, "which up to now exist almost exclusively in verbal form, will be immediately graspable through senses..."[57] Needless to say, Lintsbach's project was futuristic, even avant-garde, but also coincided with Viking Eggeling and Hans Richter's 1920 sketch of a program for a universal language based on cinematographic images.[58] Eggeling and Richter wanted to construct this language by animating elementary geometrical figures of various colours with different rhythms and directions of movement (diagonal, horizontal, vertical). Thus a new form of expression and knowledge would be generated. Richter, in retrospective, explained that "[w]ith careful analysis of the elements, one should be able to rebuild men's vision into a spiritual language in which the simplest as well as the most complicated, emotions as well as thoughts, objects as well as ideas, would find a form."[59]

As for their historical and epistomological background, these approaches can be seen as rearticulating and recombining Leibniz's late seventeenth-century studies on *ars combinatoria*, which was part of a long tradition of universal languages, artificial memories and "universal thinking machines," as developed by Athanasius Kircher and Raymond Lull, among others.[60] Leibniz believed that human thought was divisible into its constituent elements, *termini ultimi*, that are atomic, indivisible concepts, or primary alphabets of thought.[61] Leibniz's view is very similar to Lintsbach's in how in the beginning of his studies he observed that everything that is scientifically structured or scrutinizable by reason can be comprehended according to elementary geometrical figures such as the triangle and the circle. For Leibniz, these figures represent fundamental notions, and through their combinations, a geometrical topology of intelligible relations in the world can be established. Everything that is certain for reason in the world may be discovered by calculating with the universal alphabet. Thinking is calculation; the effects of logos become logistics and understanding becomes a kind of calculating machine. The universal alphabet consists of the *prima materia* of thought from which all possible combinations of concepts generate and within which all possible knowledge occurs. This notion of *prima materia* evidently is a continuation of the Aristotelian *gramma*: the primal and self-positing element as the point at which the thought of the *animal rationale* ends and mysticism begins. What is essential here is that the basic elements in *ars combinatoria* have no meaning. They are non-interpretable elements, which thought uses to calculate, or a machine like the computer could calculate. A calculus using meaningless elements becomes the essence of philosophical analysis.

In Lintsbach's and Leibniz's and, in a way, Eggeling and Richter's experiments, the Aristotelian *gramma* is understood in terms of the image, which be-

comes viewed as the final and ultimate element of thought. The image is thus subsumed under the logic of *gramma*; it becomes "writing" in the sense that it becomes the final interpreter of thinking. As a consequence, visual thinking is positioned negatively with respect to what remains outside of this "writing." The world as such cannot be named because it is always already mediated. As the negative foundation, it is pure transcendence.

The singularity of Nietzsche's ideas in this context involve his notion of imposition having the logic of *gramma* as its target, directed as it is at approaching that which remains unwritten, or rather "*para-gramma*," that is, the *Rausch* of things themselves. Furthermore, what Nietzsche believed remains *para-gramma* is not any final and absolute element or the first substance (pure actuality) beyond all beings, but the immanent difference, the will to power, that constitutes the being (in thought) of any being. This means giving expression to and exposing the world in terms of the differential elements that it is made up of, ones that, to be sure, are not elements in the sense of *grammata* – that is to say, elements that attribute being or non-being and thus fix a thing's identity – but potentialities embodying the contingency of a thing.

How can the imposition become one of difference itself and not merely a representation following the logic of primordial negativity and, consequently, temporal necessity? This is the fundamental problem that drove Nietzsche's experiments with the materiality of writing in terms of giving expression to the ontological immanence of being and becoming that the notion of eternal return implies. Crucially, it is also at this point that the image reappears in Nietzsche's thinking. "[T]he best images and parables [*Gleichnisse*]," Nietzsche wrote, "should speak of time and becoming: they should be praise and a justification of all that is not everlasting!"[62] Here, the image is directly associated with the affirmation of the temporal texture of the world as contingency and becoming, and understood in terms of a noetic activity of "making similar" (*Gleichnis*). In this sense, the concept of the image boils down to Nietzsche's treatment of the word *Gleich* in the notion of the eternal return. For Nietzsche, eternal return is the return of the "same" (*die ewige Wiederkehr des Gleichen*). Etymologically *Gleich* means that which has the same body and the same form or figure.[63] It is composed of the prefix *ge-* and the term *leich*. *Ge-* indicates assemblage, gathering together, a collective. *Leich*, on the other hand, derives from the same origin as the word *Leiche* (*līch* and *līh[h]*), a cadaver, one that means appearance, resemblance, or figure. In this sense, *Gleich* means that which remains the same as a body undergoes modifications in time, it is like a dead mask, an image which survives. *Gleich* gathers a multiplicity together into a singular constellation and thus provides the capacity to know and apprehend what has already passed away. It is the one that "guards" the world's becoming.

However, one must stress that *Gleich* is not a generic concept that imprisons the singularity of becoming in a universal term. Instead, to follow Deleuze's views on the eternal return, the most difficult point is that *Gleich* is simultaneously the similar (that which remains one) and the different (multiple).[64] We already encountered this problem in Joris Ivens's The Bridge, which concerned the repetitive formula and consequent modes of differentiation that the film embodies: multiple instantiations of the bridge do not conform to a single form but, rather, forms and figures themselves are generated from intensive multiplicities that the film apprehends in its aesthetics. In Nietzsche's terminology, the problem this kind of an image (*Gleich*) encompasses is that it "is" the eternal return in the sense that it is one (repetition), and, on the other hand, it "is" multiple in the sense that it affirms becoming (difference). As such, the image incorporates repetition as a mode of intensive differentiation. Accordingly, the image enfolded in certain key ontological and epistemological issues of Nietzsche's philosophy are connected to the expressive potential of the moving image as exemplified by The Bridge. It is precisely the dynamic being of difference, the one-multiple that Nietzsche seems to be approaching in terms of *Gleich*. Meanwhile, the image in Nietzsche's thought does not only concern the world of *Schein* but also the world viewed from within, the world of the will to power. What is at work in Nietzsche's ideas is what can be called the differential image, the image as a process of differentiation and ultimately creation. The notions of imposition and *Gleich* then unassumingly develop a very original conception of the image itself, one that attributes the capacity to function as a form-producing interval to the image, or an internal differential principle that generates being by "imposing" becoming.

Lightning-Image

What we see here in Nietzsche's case is very similar to what we have already encountered in the previous chapter: the moving image emerges as a paradoxical rhythm that gives thought its direction and sense. In the philosopher-poet's mind, the questions of the image and dynamic visuality become in particular related to the problem of time. This is not a coincidence because cinema endows the image with a novel kind of temporal intensity, especially a novel mode of temporal repetition and differentiation. This temporality is manifested in Ivens's The Bridge, as well as in the split screens of Stellan Rye's The Student of Prague in which Balduin meets his double and the image cracks open to reveal the depths of time. *Doppelgänger* shots embody intervals that split the visual field into a process of differentiation whereby the actual Balduin confronts the others

that populate his existence, the potentialities that constitute his being. These intervals incorporate ruptures in vision through which the past (or memory) repeats itself in terms of creating difference in the present.

For Nietzsche, the eternal return entailed a similar problematic of visuality, time and differentiation. This notion actually arose a few years prior to Nietzsche's work in the writings of Albert Blanqui, during his imprisonment in the Fort du Taureau. Blanqui envisioned a scene in his mind that is quite similar to the one that takes place in the Jewish cemetery in The Student of Prague with *Doppelgängers* manifesting a temporal recurrence. In *L'Éternité par les astres*, first published in 1872, Blanqui writes:

> Every human being is thus eternal in each second of her/his existence... The number of our doubles is infinite in time and space... These doubles are of flesh and bones, even dressed in trousers and overcoat, in crinoline and bun. They are not phantoms; it is actuality made eternal.[65]

For Blanqui, the present not only reaches into the future but embraces the past within itself in terms of an infinite number of doubles – ones that cannot be understood as phantoms in the sense of unreal apparitions or mere reflections but more in the sense of what the Greeks called *phantasma*, that is, potentialities of "coming to the fore" that are immanent to the actual, in the sense of incorporations of temporal depths immanent to the actual present.

In this respect, Blanqui's musings are similar to Nietzsche's who had already developed an early version of the idea of the eternal return in his 1873 "Time-Atom Theory" fragment.[66] Significantly enough, Nietzsche drew a little picture in order to articulate the nature of time, instead of relying totally on alphabetic symbols (fig. 11). The diagram consisted of dots that represent temporal moments, time-points, and form an imagined vertical line. The spaces between the dots, however, are crisscrossed with strokes as if to emphasize the point that the dots remain separate from each other and do not form a continuum. The diagram also includes overlapping semi-circular lines which connect separate points to each other, creating temporal folds that condense two moments into one. The strokes between the dots as well as the fact that the dots remain separated from one another so as not to form a continuum create a fundamental notion explained in the fragment: the linear succession of time is established by the limitedness of our senses and the conventions of imagination. Nietzsche observed that "a reproductive being is necessary, which holds earlier moments of time beside the present."[67] This is the work of representation or *Schein*; it generates space and deduces "coexistence" or succession, subsuming movement within space. In contrast to this operation, however, Nietzsche argued that movement was more profoundly related to time. In the diagram, the folds present this temporal motion. From the diagram one can thus infer how Nietzsche

conceived of movement as consisting of the enfolding and unfolding of temporal depths, the past and the future, in a time-point or a moment.[68] This moment is one in which the past and the future encounter each other and the recurrence of time becomes tangible and apprehensible. At this moment past and future are affected by each other and become contingent with respect to each other. It is thus a moment of potentiality at which the recurrence of time creates difference in the present.

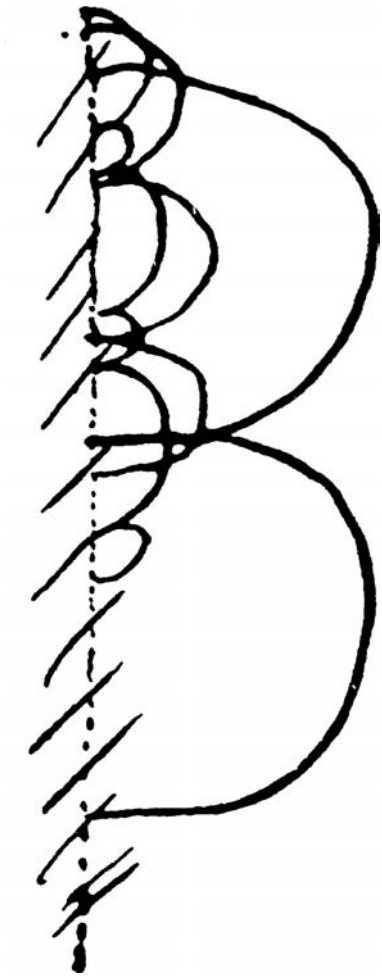

Figure 11 Drawing by Friedrich Nietzsche, 1873

The question that concerns us here is the role of visuality in Nietzsche's thinking about time – what is the relation between the image and this temporal move-

ment in his philosophy? In a fragment from a few years later, Nietzsche noted how the eternal return is disclosed in an instantaneous lightning image: "[T]he *infinitely small moment* [*der unendlich kleine Augenblick*] is the highest reality and truth, a lightning-image out of the eternal river [*ein Blitzbild aus dem ewigen Flusse*]."[69] As Gary Shapiro shows, the *Augenblick*, the twinkling of an eye, often translated as "moment," is a theme that runs through all of Nietzsche's writings.[70] In the "On the Vision and the Riddle" section of *Thus Spoke Zarathustra*, the *Augenblick* reappears when the eternal return is introduced for the first time. The abysmal thought of temporal recurrence is intimately linked with a certain kind of vision, thematized in terms of seeing the abyss, as Zarathustra asks, "Is seeing itself not – seeing the abyss?"[71] The "riddle" of this kind of vision assumes the form of a gateway, which has a double meaning in the sense that it leads to two separate paths:

> "See this gateway, dwarf!" I continued. "It has two faces. Two paths come together here; no one has yet walked them to the end.
>
> This long lane back: it lasts an eternity. And that long lane outward – that is another eternity.
>
> They contradict each other, these paths; they blatantly offend each other – and here at this gateway is where they come together. The name of the gateway is inscribed at the top: 'Moment [*Augenblick*].'[72]

The past and the future collide with each other in the *Augenblick*. It is a double-edged moment of the violent confrontation between two conflicting forces in which one realizes that each moment is impregnated with the entire past and the entire future, with each moment carrying within itself the abyss of time. It is a moment of ungrounded difference, since the abyss is groundless – a vertiginous moment that opens up to the virtual. In other words, in the *Augenblick* potentiality (whatever *can* happen and *could have* happened) is real; time repeats itself as potentiality in the present. Potentiality here is not a spectral possibility waiting for its realization but, instead, it has already been realized and thus "subsists" in every fleeting moment.[73]

The *Augenblick* concerns visibility as much as momentary blindness and invisibility, and thus envelops virtuality. Accordingly, the mode of vision it encompasses should also be characterized as virtual, which pertains to a visuality made up of fissures and interstices that open up to dimensions other than the three spatial ones that define the world of solid objects and stable identities. As such, the *Augenblick* cannot be conceived of as limited to the visual field of the phenomenological observer and should not be merely understood as the shortest perceivable duration of which we are conscious.[74] At this moment, on the contrary, durations that are superior or inferior to ours are emerging. During the late nineteenth century, cinema emerged as the technology that produced

novel visual dimensions by exceeding the duration of human vision. The cinema is a veritable technology of the *Augenblick* in at least two senses; firstly, it is based on our blindness to infinitely small durations and, secondly, it is capable of presenting the double-faced gateway to the abyss of time in those differential images we encounter in The Student of Prague, for instance. We can thus see how, in the latter sense, and with the ruptures in vision that the split screen shows, the moving image equals the lightning image thematized by Nietzsche, that is to say, a differential image of potentiality.

When it comes to developments in Western visual culture during this period, one should note that the notion of the differential image as a moving image with similar temporal problematics also directed Aby Warburg's unfinished project from the 1920s called the Mnemosyne Atlas. Atlas consists of a number of black screens on which different kinds of material – text and photographic reproductions – are grouped together under specific themes ranging from ancient cosmologies to the nymph in Western culture (fig. 12).[75] Without going into details, about Atlas or Warburg's own theory of art and its relation to Nietzsche's thinking, let us briefly analyze the mode of intelligibility that Warburg attributed to the image in the project.[76] Suffice it to say that the explicit objective of Atlas is to trace how certain visual motifs from the classical period "survive" and recur in the visual arts of the Renaissance – and thus, more implicitly, to explore the circuits of time and memory with regard to visual material. The screens in Atlas are not supposed to present static constellations of texts and pictures but, instead, as Philippe-Alain Michaud points out, put the image in motion.[77] The image is approached as fundamentally dynamic. Mnemosyne Atlas is not merely seeking to spatially collect and juxtapose the pictorial strategies of a given historical period and their variation in history. George Didi-Huberman explains that, on a more profound level, and despite first impressions, it attempts to trace how the image itself subsists in time, the image's survival (*Nachleben*) in time.[78] Even though it is partly derived from the centuries-old tradition of mnemotechnics, Atlas nonetheless differs from the spatially oriented compositions of the older arts of memory, as its images are fundamentally impregnated by time and recurrence.[79] Atlas is supposed to solve the problem of temporal passage and, in this sense, to apprehend the various durations of images. As such, it even culminates in a certain kind of madness or Dionysian drunkenness that is also inherent to Nietzsche's work, which struggles, as Didi-Huberman observes, to "think of all images together with all their possible relations."[80] Indeed, each screen in Atlas appears as a gesture that comprehends differential temporal relations and morphogenetic forces.

Figure 12 Aby Warburg, Bilderatlas Mnemosyne, *1927-29, screen 46*
London, Warburg Institute Archive. Photo: The Warburg Institute

Mnemosyne Atlas is based on an unusual perception that coincides with Nietzsche's differential image in presenting the virtual forces that survive and subsist extra-temporally. For example, screen 46 (fig. 12), which has the visual motif of the nymph as its subject, does not simply lay out a collection of particular images of nymphs or try to make visible their general model. Instead, the screen exceeds this logic of the model and its copies, the one and the many. It approaches the "nymph" as a multiplicity and takes hold of the differential elements that constitute the specific forms and figures of nymph, making visible the "auto-affection" of these elements in time.[81] The screen presents the nymph's diverse actualizations in various historical contexts, from seventh-century ivory reliefs to Domenico Ghirlandaio's fresco *The Birth of John the Baptist* (1486), as it simultaneously highlights the sphere of potentialities, the differential relations, from which these actualizations emerge. One of Atlas's striking features is that the sphere of potentialities is harnessed in the black intervals between the pictorial and the textual material. The notion of an "imageable" temporal interval becomes crucial, as in its own fashion Atlas relates the image to time and thus makes the image that survives intelligible, as it is captured in the interval where past and future encounter and affect one another. The screen thus brings forth a "lightning-image emerging from the eternal river," one that we tend to remain blind to but which, nonetheless, may become thinkable due to the interactions between actual images that are taking place in the black space. The black gaps between the actual images become temporally oriented intervals, verging on the abyss of time, which each image emerges from and falls back into.

Mnemosyne Atlas is basically characterized by the attempt to not simply juxtapose images and words in space but to put the image itself in motion in time and to engage the differentiating status of temporal repetition.[82] Atlas is composed of differential images, and, in fact, it strikingly resembles the differential montage in cinema as described by Deleuze:

> Given one image, another image has to be chosen which will induce an interstice *between* the two. This is not an operation of association, but of differentiation... given one potential, another has to be chosen, not any whatever, but in such a way that a difference of potential is established between the two, which will be productive of a third or of something new.[83]

It is via this kind of differential montage that Warburg's constellations produce disruptions and disjunctions of vision, whereby they grasp the folds of time and memory and thus become cinematically oriented rhythms of thought. These rhythms also characterize Ivens's The Bridge, which scrutinizes the virtual forces that direct and determine its object. The Bridge does not simply juxtapose forms and movements in order to bring about a general representation of

the bridge. Even though the film evidently builds on the association of elements in terms of the continuity of the bridge's function (for example, the shots of machines running followed by the bridge raising), it also includes editing techniques that reveal other kinds of linkages and implement the operation of differentiation, which is based on differences of potential like, for example, the contrasts in kinesthetic forces and rhythms or variations and interactions of diverse shapes and forms.

Cinema thus amounts to a specific kind of noetic movement. Since no medium ever determines its outputs, serving instead as a contingent capacity to generate strikingly heterogeneous constellations, we also have a particular expression of the moving image's rhythms in Mnemosyne Atlas, although it is apparently different from actual films or Nietzsche's writings and little diagrams. Warburg stated that the basic objective of Atlas is to think in images, or more precisely, to highlight the movement between the sensible and the intelligible, the actual image and the concept in the black interval.[84] In Nietzsche's case, too, the moving, dynamic image and thought are essentially intertwined. Of course, Nietzsche's use of the image can be seen as merely a metaphorical operation of language. However, as Nietzsche himself maintains, "for the genuine poet metaphor is no rhetorical figure, but an image which takes the place of something else, something he can really see before him as a substitute for a concept."[85] Moreover, in Nietzsche's later work, this earlier assertion of a mediating image (*stellvertretende Bild*) is transformed into the notion of an "immediate" "lightning-image" or *Gleich* as the differential element in thought, a fleeting moment that would indeed let the dark abyss of time as the world's fundamental texture be exposed (but not unambiguously named or written down). It is in this *Augenblick*, based on moving images that plot thought, that the world is seen from the viewpoint of the will to power, through its potentialities.

6 Virtual Image: Cinema and Intuition

Cinematographical Mechanism

In his 1903 essay "An Introduction to Metaphysics," Henri Bergson noted that: "Time is what is happening, and more than that, it is what causes everything to happen."[1] This quote by one of France's most influential philosophers at the time crystallized his attempt to reconfigure our understanding of time and its ontological primacy. Instead of being a measure of movement or an abstract framework for events, Bergson understands time as mobility and emergence, as the most intimate texture the world is made of. However, time also becomes something intellectually elusive. While it is ontologically primary, Bergson also considers time to be epistemologically uncertain, and the philosopher's work is haunted by the question of how we can perceive the world's temporal nature and give it adequate expression in thought.

Generally speaking, the elusiveness of time was a central problem at the turn of the twentieth century, incorporating modernity's preoccupation with the present and temporal drift that, as Leo Charney shows, became located at the obscure limit between the fleeting present and its representation, the world and the mind.[2] Charney also maps out how this preoccupation was related to the proliferation of a new technology for visualizing and recognizing the world from a temporal perspective circa 1900, in other words, cinema. As we have seen in the previous chapters, at the turn of the twentieth century, the question of comprehending temporality was articulated via the moving image. Various artistic forms, intellectual paradoxes, philosophical diagrams and concepts manifested how the moving image incorporated and also raised specific problems concerning the temporal nature of things and beings. Friedrich Nietzsche and Aby Warburg both considered the cinematic and other kinds of dynamic images to be essential in dealing with the question of how to apprehend the world not under the category of space but as fundamentally temporally constituted. In its noetic rhythms, the moving image framed the very question of how to recognize the folds of time among which the world finds its intelligible character.

This question is also essential to Bergson's philosophy, which is a significant reconfiguration of time, memory and visuality during the era. It characterizes Bergson's famous critique of the "cinematographical mechanism of thought" in *Creative Evolution* (1907), in which Bergson puts forward an analogy between the new technology of moving images and our ordinary forms of perception and knowledge.[3] The main point of Bergson's criticism is that the cinematograph, which represents a model of intellection, is characterized by a fundamental incapacity to conceive of movement itself. Instead of perceiving the world as dynamic, heterogeneous and temporal, it homogenizes and abstracts movement and thus it remains incapable of seizing the world in its internal and constitutive becoming. In other words, cinema as a mechanism appears as the antagonist to what Bergson calls "life," which is understood not as a reaction against death but as a virtual, creative tendency, that gives rise to the new and the unforeseen. Bergson contends that its very technical function prevents the cinematograph from reaching this subtle and unique movement of creation that proceeds by "dissociation and division," because it arbitrarily registers immobile snapshots of a mobile and then reconstitutes its successive positions within an abstract and impersonal framework of "movement *in general*." The cinematograph, according to Bergson, only artificially recomposes movement. Instead of attaching itself immanently to the world's becoming, it seems to remain transcendent and exterior to it. This is also, Bergson maintains, how "perception, intellection, language" usually proceed: "Whether we would think becoming, or express it, or even perceive it, we hardly do anything else than set going to a kind of cinematograph inside us... *[T]he mechanism of our ordinary knowledge is of a cinematographical kind*."[4]

From this perspective, the philosopher relates the cinematographical mechanism to the exigencies of practical or "physiological" life.[5] Ordinary knowledge and intelligence are relative to corporeal needs that require the representation of movement in view of action. For Bergson, the task of philosophy nevertheless consists of overcoming these needs, surpassing the "human condition" and opening up to the inhuman, to durations inferior or superior to ours that function as genetic conditions of experience and thought.[6] "In order that our consciousness shall coincide with something of its principle," Bergson wrote, "it must detach itself from the *already-made* and attach itself to the *being-made*."[7] One should "recover contact with the real."[8] It is this noetic movement in particular that will encompass the integration of the reality homogenized and abstracted by ordinary forms of intelligence, whereby the world in its internal consistency can be attained.

Thus a substantial problem dealt with in Bergson's work is how to come up with an adequate thought and expression for things in terms of duration and becoming. In this respect, Bergson's critique focuses on and is divided into two

separate regimes of images, two modes of visual knowledge, which, according to him, the cinematographical mechanism incorporates as both a technology and a model of certain kind of thinking.[9] Firstly, ancient physics and metaphysics are based on the regime of privileged poses or characteristic attitudes, one exemplified by the sculptures of satyrs and Athenians fighting in the Parthenon. These are forms independent of time and thus immobile.[10] Secondly, "modern science" is organized around the regime of any-instants-whatsoever according to which the flux of reality becomes analyzed through a quantitative decomposition of time into possibly ever-smaller intervals as occurs in chronophotography.[11] Instead of privileged or essential moments, modern scientific knowledge rests on quantitative variations within instants, ones that, despite appearances, remain immobilities, mere spatial positions of a mobile on virtual arrests (or "freeze-frames") that form a trajectory *t1, t2, t3, tn*.[12] Bergson argues that modern science works by merely juxtaposing arbitrary moments and interpreting movement within the category of space, where it also remains incapable of conceiving movement, the flux of time, in its own terms.

Bergson needed a third type of visual regime, one that would consist of images that endure and become, and can simultaneously apprehend duration and becoming. These kinds of images would contribute to the formation of adequate thought about duration, presenting movement and change itself without referring to another dimension such as the rigid framework of (Cartesian) space. It is conceivable that this image, in spite of Bergson's explicit critique of the "cinematographical mechanism of thought," can be compared to the one that exhibits self-motion in cinema. In fact, the philosopher's criticism as such does not quite do justice to the medium of the moving image, not even if someone like Bergson were to simply look at the technological configuration of the cinematograph and other pre-cinematographic apparatuses.[13] In Bergson's treatment, the cinematograph merely reproduces or mirrors our ordinary corporeal and intellectual capacities, whereas, as we have seen, novel technological configurations during the late nineteenth century exceeded the limits of, and modulated, the human capacities of sensation and "cognition," opening perception and thought – to put it in the philosopher's own terms – up to durations inferior and superior to the phenomenological subject. Similarly, when Bergson looks at chronophotography he straightforwardly identifies the technology with its scientific rationality, in this case, the instrumentalization and experimentalization of life and the abstraction of duration. However, technology is more than its ends, thus also embodying a means without ends, a sphere of potentiality. Technology implies an ontological opening or "overflow," one that, in the case of the moving image, is temporal by nature, as Mary Ann Doane has shown.[14] In the moving image, it is time itself – and this is exactly the point that Bergson

himself would stress – that fundamentally undermines the attempts of its technical regimentation in the succession of discrete images or scientific formulas.

It is noteworthy that the "excess" of time becomes visibly exposed even in Étienne-Jules Marey's so-called unsuccessful experiments with chronophotography, in which a body that is moving too fast, for example, causes disorientation within the image. While Marey's primary intention was to cut the movement of a body into quantifiable instants, the results of some of his experiments displayed something else: the contours of a body become blurred and the figure increasingly becomes an involuntary expression of its temporal dynamics and processual nature. This is an example of how the pre-cinematic technology of chronophotography is manifested as a potentiality that exceeds the scientific – and one should also note, biopolitical – ends imposed upon it. Movement resists becoming abstracted and calculated within the "infinitely divisible" trajectory of discrete instants, and the contours of the mobile become increasingly blurred, causing cognitive confusion. Crucially, following Doane's and Georges Didi-Huberman's analyses, these images expose novel relations of visuality and time that emerges with images that begin to move and, consequently, novel ways of apprehending the world, ones that in fact escape Marey's own epistemological framework of spatial juxtaposition.[15] The visible and cognitive confusion concerns the temporality inherent in the moving image that testifies to another mode of knowledge the image is also capable of giving rise to, a mode that tends to converge with the indivisibility, irregularity, complexity and unpredictability that for Bergson characterizes the world's true texture. Marey's unsuccessful chronophotographs are fuzzy, unreadable or undecipherable only within the limits of the experimental physiological plane of reference but simultaneously have the potential to generate other modes of perception and thought, which converge with the morphological complexity and processual nature of things. They harness the contingency inherent in things and events that duration envelops and introduce a new kind of continuity and "differentiality" into the discontinuous and in this way touch the very ontological basics of Bergson's ideas.

Furthermore, Doane notes that a similar kind of tension between the meaningful and the contingent characterizes early actualities such as What Happened on Twenty-third Street (Edison Company, 1901), which investigates the film camera's capacity to record a chance event, a gust of air blowing through a sewer grate and lifting a woman's dress as she passes by. Doane argues that significance here, "is not predetermined in an ideal form, but emerges out of the accident; it is variable and unpredictable."[16] The film produces meaning out of contingency through perceptual surprise that sees each moment as potentially undetermined and capable of producing the new. The cinema, in other words, does not necessarily regiment time but is able to give an expres-

sion to the unpredictable and the fleeting and even develop into a perception of becoming.

Embodying chance and contingency, the moving image thus seems to encompass a potential for perception and intellection that is closely linked with Bergson's attempt to reconfigure our understanding of time and the world as durational. This observation establishes the program we shall pursue in this chapter, which is to map out how Bergson's philosophy developed as isomorphic with this cinematic capacity to think of temporality from a novel perspective. In what follows, we shall supplement Bergson's notion of the cinematographical mechanism with several other concepts concerning the dynamics of the image and visuality that are found in his work in order to decipher how the new medium contributed to the philosopher's work of redefining the question of time.

Indivisible Interval

Before we investigate Bergson's writings, let us reframe his critique of the cinematographical mechanism of thought in relation to the potentialities of perception that the cinematographic recording of movement engenders. While Bergson was writing *Creative Evolution*, new modes of scientific perception and the knowledge of movement and matter emerged. The moving image also played a peculiar kind of cognitive role in these developments. In 1905, Albert Einstein published a paper, entitled "On the Movement of Small Particles Suspended in a Stationary Liquid Demanded by the Molecular Kinetic Theory of Heat," that deals with a phenomenon known as Brownian motion, which basically describes continuous but random movement at a molecular level.[17] The phenomenon was initially named after the botanist Robert Brown who, in 1828, reported microscopic observations regarding the reactions of various materials suspended in liquids that dissolve into small particles that could be observed moving in a constant but irregular and "swarming" way.[18]

This observation would turn out to be a perplexing case in the context of nineteenth-century science. On the one hand, Brownian motion seemed to support atomism, which was not a unanimously accepted theory of matter. On the other hand, the ceaseless motion described by it impugned the absolute validity of the second law of thermodynamics – the principle of irreversibility of thermodynamic processes – and would eventually lead Einstein to demonstrate that the law itself should be interpreted in statistical terms. In the latter half of the nineteenth century, the kinetic theory of heat, which confirms fluctuations at a molecular level, was often considered a possible explanation for Brownian mo-

tion although it diverged from phenomenological thermodynamics concentrating on describing directly observable phenomena.

That was also the starting point of Einstein's work. Although previous explanations were merely qualitative in nature, Einstein provided an experimentally verifiable mathematical theory. He altered the object of observation and thus rearticulated how to identify irregular movement or the particles' "random walk." Instead of concentrating on the actual trajectory that a particle traverses during a given time interval, Einstein estimated the displacement a particle or a group of particles effectuated. This displacement cannot be determined within the absolute laws of motion; it is not a linear function of the interval of time. In this way, according to Roberto Maiocchi, with Einstein's approach "it is no longer a matter of trying to measure the velocity of Brownian movements (obtained by dividing the length actually traversed during the observation time by the time itself), but of a different quantity."[19] Stochastic molecular movement becomes determinable statistically and describable via probability distributions: the displacement is measurable as the intervening distance between the points of departure and arrival of a particle, and the new quantity to be observed is not velocity but the mean square displacement (proportional to the square root of the time necessary to traverse the distance).

Einstein's theory soon became an object of experimental tests and/or verification, especially via the ultra-microscopy methods that developed in 1903 as well as chronophotographic and cinematographic recordings. As for its visualization, it is crucial that we do not see the motion of the particle; the actual path itself is not observable in all of its complexity. Not surprisingly, early attempts by scientists to produce an empirical proof of Einstein's theory were marked by a confusion in identifying the novel quantity that no experimenter had ever dealt with before – a confusion that, as Scott Curtis suggests, also reflects the perceptual and conceptual potentialities embodied in the "cinematographical mechanism."[20]

A case in point is provided by the German physicist Max Seddig who, in 1907-08, arranged a series of experiments to verify Einstein's equation, which he later revised in 1911.[21] Apparently, the 1907-08 experiments that attempted to trace the particles via ultramicroscopic photography already seemed to confirm and correctly interpret Einstein's theory. However, as Maiocchi points out, it was not that simple. Despite the appearances, Seddig had been conceptually misled, as he attempted to identify the particle's movement according to its supposed visible trajectory. Maiocchi notes that Seddig understood Einstein's formula in terms of "the mean value of the lengths of *the paths actually followed by the particles*, not of the segments which connect the departure and arrival points..."[22] This became more evident in the 1911 experiment when Seddig clearly stated that in order to confirm the formula one needed to measure the

actual paths of the particles that appeared under the microscope as luminous self-moving points and trace the black trajectories on a photographic plate.[23] However, the case became even more complicated when Seddig tried to revise his method after realizing how the measurements became distorted in the excessive heat emitted by the lighting. He substituted an intermittent light source for the continuous one and adjusted the automatic shutter controller of a film camera to operate according to this time interval. This allowed each particle to leave traces on the film, which corresponded to the flashes of light, so that what is registered is not the actual path of the particle (the path itself left no trace on the film) but its positions at the times of the flashes. Thus, the only aspect that could be measured was the length of the segment of the straight line that connected the departure and arrival points. This length, Maiocchi points out, is "the correct empirical translation of Einstein's... notion of 'displacement'."[24] In other words, Seddig unconsciously stumbled upon the solution that provided an accurate interpretation of Einstein's theory. Thus, the new modes of perception and conceptualization of the molecular movements of matter postulated by the theory became transposed by the cinematograph.

In Seddig's later experiment the technological configuration of the cinematograph appears as conceptually congruent with Einstein's theory. The moving image perceptually and "noetically" merges with the theory in the sense that it embodies a similar direction of thought and condition of visuality. This suggests that the capacities of comprehending and conceptualizing the world manifested both in Einstein's equation and the moving image are, at least to some extent, parallel. What is essential in this respect is how the interrelations between the image, movement and visibility are altered. The configured "cinematographical method" does not directly concentrate on a moving body changing positions over time but, rather, on the temporally oriented interval of a particle's only statistically determinable displacement itself, that is, the blank space between image-frames, which presents the absence of visible motion in space. The image does not simulate a body's course on its trajectory but, fundamentally, brings to the fore "empty" blocks of possible motion and displays the particle's displacement within a given duration.[25] Instead of registering discrete any-instants-whatsoever of a trajectory and observing movement in terms of these intermittent positions of a mobile, the moving image now harnesses the "empty" time of (statistically determinable) variation, or a space of possible trajectories. The interval, in other words, harnesses a space of possibilities that captures the process of a system's evolution.

Furthermore, the particle, unidentifiable in the various positions along a trajectory, appears to be deprived of a rigid identity over time. One could say that a thing, being related to its possible trajectories, becomes temporal and also contingent by nature, since it lacks a permanent existence outside of its event, that

is, the accidents that happen to it in molecular affections. The observations on Brownian motion participate in a general tendency in nineteenth- and twentieth-century physics in which the object loses a certain degree of "reality" in terms of solidity and permanence assumed by substance ontology and classical physics. We will see how this relates to the problem of the continuum and temporality as it is dealt with as cinema was emerging, a problem that was expressed by mathematician Hermann Weyl in 1918 in the following manner:

> The view of a flow consisting of points and, therefore, also dissolving into points turns out to be false. Precisely what eludes us is the nature of the continuity, the flowing from point to point; in other words, the secret of how the continually enduring present can continually slip away into the receding past.[26]

At this stage, however, let us note that it is this kind of temporal or processual nature of a thing that also influenced Bergson's philosophy. In *Matter and Memory* Bergson credited developments in nineteenth-century physics – especially those of Joseph John Thomson and Michael Faraday[27] – for attempting to connect matter and energy. This is how developments in nineteenth-century physics, Bergson maintained, avoided endorsing localizable, permanent and self-identical elements as constituents of reality and posited the primacy of movements and lines of force that emphasized "universal continuity."[28] These developments already pointed to the notion of approaching matter in terms of modifications, perturbations, and changes of tension or energy, and most fundamentally, identifying matter with movement and duration. A substantial point for Bergson was that real movement is by nature indivisible, meaning that it cannot be divided without its changing in kind. Therefore, it also cannot be the object of mere quantification. This means that movement is only conceivable as always already passing, in formation, in progress. It is intensive and qualitative. Unlike classical physics and philosophy, which define movement in terms of displacement, or the change of position of a material body, Bergson approached movement without referring to a moving body or to a supposed "container" (space).[29] Movement, Bergson stressed, should not be conceived as the movement of something but in its own terms and identified with change as such, that is, transfer and progress rather than the bare repetition of states of affairs:

> There are changes, but there are underneath the change no things which change: change has no need of a support. There are movements, but there is no inert or invariable object, which moves: movement does not imply a mobile.[30]

For Bergson, the space traversed is a matter of extension and may be determined quantitatively but movement itself is only conceivable in duration as intensive and indivisible.[31] It is to this indivisibility that the blank interval in Sed-

dig's experiment can be seen as pointing toward. Bergson accordingly argued that in thinking of duration and movement one should not be concerned with the ends of the intervals but with the *intervals themselves*. As Bergson observed one should escape from "fixing the moving images" and instead, simply endorse them as such.[32] The philosopher pursued a mode of visually oriented perception and thought, which, like the one inherent in Seddig's experiment, confirms molecular affections of matter essentially intertwined with "jerky" rhythms and passages of time. This suggests first of all that perception merges with matter itself, a pure perception of matter that, in the beginning of *Matter and Memory*, is accurately called a constellation of moving images. "Pure perception" means an immediate and instantaneous perception, not yet structured according to the limits of practical life that is *in things*, one with the movement, the molecular becomings and changes that constitute things.[33]

Of course, from a phenomenological viewpoint, this universe of matter and movement remains unperceived, since as pure presence it cannot be represented. It remains "unconscious." However, in its technical flaws or blank intervals, cinematic presentation becomes attached to this pure perception. It verges on, to put it in Bergson's words, an "unconscious material point" of which the perception of the universe "is infinitely greater and more complete than ours, since this point gathers and transmits the influences of all the points of the material universe, whereas our consciousness only attains to certain parts and to certain aspects of those parts."[34] What is registered in the interval in Seddig's experiment, but remains invisible, is a process of alteration that touches upon the dynamic, heterogeneous and stochastic motion that underlies the world of homogeneous, static and solid phenomena. The blank interval approximates the indivisible process of change itself. It should be noted that in the early conceptualizations of film, this type of perception was theorized by Élie Faure according to whom cinema revealed a "previously unsuspected molecular universe, which prolongs beyond the limits of visible space the disordered waves of cinematographic movement."[35]

Both the medium of moving images and developments in the scientific perception of matter during Bergson's time thus exceed representation, or what he called the cinematographic illusion of thought. As Gilles Deleuze argues, Bergson's critique does not simply frame scientific thinking in antagonistic terms – but by the same token, Bergson noted that, although science seemed to concentrate on material movements, it did not produce a philosophical or "metaphysical" conception of the world. Hence, Deleuze writes, science "demands a new metaphysics, which now only takes into account immanent and constantly varying durations."[36] Bergson's project was focused on the construction of this metaphysics, as he himself argued: "Granting to science the power of explaining matter by the mere force of intelligence, it [metaphysics] reserves mind for

itself. In this realm, proper to itself, it seeks to develop new functions of thought."[37] One of the major epistemological issues that arises here is how philosophical thinking will bridge the gap between mind and matter that results from the act of representation. Crucially, as we shall see, Bergson's attempt to overcome this duality by creating "new functions of thought" also involved a specific notion of the image, one that is intimately linked to the visuality produced by cinema circa 1900.

Memory and Mirror

Bergson's philosophical vocabulary is very visual, abounding in variations of the word "image," and it seems that the specific wordings Bergson used were a sign of deeper transformations in the patterns of visuality and temporality at the turn of the twentieth century. In a close reading of Bergson's texts we can, besides the notion of cinematographical mechanism, also distinguish at least three general senses of the image that structure his thought.[38] First, the image signals pure presence, as well as pure perception, and encompasses the swarming of matter in a random manner, the immediate material actions and reactions mentioned above. This image works under the perceptual thresholds of the phenomenological observer. Secondly, the image signals the representation of the world produced by the phenomenological subject in light of their actions and practical interests. Finally, what arises from the latter is a notion of the virtual image, which is not limited to representation but embodies durations that are superior and inferior to ours. In what follows here, we shall focus closely on the second and third senses in order to unravel how the cinema becomes encountered in certain key ontological and epistemological aspects of Bergson's philosophy.

Bergson called representation an image perceived by subjects conscious of their surroundings and themselves. Its formation basically allows a thing to be seen by an observer and it is based on a type of framing: through the selection and discernment of material images, an object is isolated as a figure against a background, whereby the complexity of the world is also diminished according to our practical, and primarily physiological, needs.[39] Furthermore, representation signals the attentive recognition of a subject that not only reacts to impressions but is capable of reflecting upon them and thus paying attention to the world, interpreting it as well as recognizing it intellectually.

According to Bergson, the formation of representations embodies a particular interplay between perception and memory. In explicating the work of attentive recognition Bergson wrote about a circuit between these two realms that forms

"a closed circle, in which the perception-image, going toward the mind, and the memory-image, launched into space, careen the one behind the other."[40] It is in the intense interplay between actual perceptions and virtual memories that the fleeting object becomes framed as relatively permanent and stable. Representation is thus an energetic process that involves the past as much as the present. Furthermore, Bergson noted that, in addition to the object, we also reconstitute several connections or conditions with which the object forms a system in the process of representation. That is to say, the object is not simply apperceived individually but also conditioned by a system within which it becomes situated. Representation operates "the projection, outside ourselves, of an actively created image, identical with, or similar to, the object on which it comes to mold itself."[41] This projection draws a system of connections that are "virtually given with the object itself" from within the deeper layers of memory and thus produces a more refined and rich image of the object. Thus attentive perception or recognition is a two-fold process that is directed at the expansion of memory as well as more and more "intimate layers of reality."

The mechanism of representation nevertheless tends toward action and is characterized by the sensorimotor scheme. Selected layers of the past, certain memory-images, are evoked in perception in order to better understand the present and anticipate the future. However, on the other hand, in Bergson's writings, the circuit between perception and memory simultaneously points to a third sense of the image, that is, the virtual image. This notion comes up in his 1908 essay "Memory of the Present and False Recognition" in which Bergson writes about the existence of two images pertaining to perception and memory.[42] He characterizes the memory-image as a reproduction or a double of a present perception that is created in mental operations. The main problem the essay brings up regarding temporality, the image and virtuality concerns the nature of this reproduction or doubling: is memory constituted only "after the fact" as a faint reflection, re-presentation, of the perceived present moment? Bergson answers in the negative and proceeds to argue that the formation of a memory is never after but always contemporaneous with perception. A memory-image is created simultaneously alongside a perception-image, "as the shadow falls beside the body."[43] In other words, a very substantial notion of the image as non-representational memory and past appears alongside the concept of perception-image.

Here we encounter a fundamental ambiguity in Bergson's conceptual framework regarding memory and the image, or the image as past. For Bergson, the notion of the virtual image focuses on the problem of giving expression to the virtual folds of time that exceed the phenomenological realm. To this end, Bergson in his approach to the nature of memory and past also contended that "the recollection of an image is not an image."[44] Memory, in other words, cannot be

enclosed in a representation; it is non-representational. Bergson maintained that memory could only be described metaphorically, and proceeded to argue that it was "to the perception what the image reflected in the mirror is to the object in front of it." The object is actual, it affects us and it is also shaped by our possible actions upon it. But the image in the mirror is virtual; it is a virtual image. In this way:

> Every moment of our life presents two aspects, it is actual and virtual, perception on the one side and memory on the other. Each moment of life is split up as and when it is posited. Or rather, it consists in this very splitting, for the present moment, always going forward, fleeting limit between the immediate past which is now no more and the immediate future which is not yet, would be a mere abstraction were it not the moving mirror which continually reflects perception as a memory.[45]

We shall come back to the notion of splitting time, but let us first focus on the nature of the virtual double or "reproduction" in the mirror that is articulated in this passage: is it just an ineffective copy or something endowed with a certain spontaneity or potentiality itself? Bergson, in this regard, remained rather ambivalent. On the one hand, the virtual image is "incapable of doing what the object does," presenting a possible object deprived of reality. On the other hand, Bergson confirms that it has the capacity to *suggest*, like hallucinations or *Doppelgängers* in which the sensorimotor scheme, the mechanism of representation, at least momentarily breaks down and new ways of sensation and thought are introduced to the mind.[46]

"Suggestion" here does not imply a copy of the world or a representation of the past. Instead, the virtual image suggests the development of a differential rhythm of duration from the depths of memory – a rhythm which expresses, not the correspondence between a perception-image and a memory-image, but their internal difference, or the difference of time in its splitting into the present and the past. Indeed, for Bergson, (non-representational) memory is not comprised of atomistic or separable moments but of planes which instantiate singular rhythms of duration. They are, as Keith Ansell Pearson points out, continua "made up of unique accents, potentials, and critical moments."[47]

Thus, we see how the virtual image is related to a fundamental aspect of Bergson's thinking concerning the nature of time. For Bergson, time is not something to be conceived as the succession of atomistic moments but rather something in terms of continuity and coexistence. According to him, time consists of two heterogeneous "jets" or directions: the present which passes and the past which is preserved. The present is "two-fold at every moment." Time splits and doubles "into two jets exactly symmetrical, one of which falls back towards the past whilst the other springs forward towards the future."[48] In other words, memory doubles present perception at each and every moment. This double

(the past) is qualitatively different from the present, and hence, it, as Bergson noted, "survives" and forms an infinite constellation of memory-planes, a totality of a "pure memory." In *Matter and Memory*, this constellation is presented in the famous diagram of the inverted cone with different sections or levels of the past simultaneously with the present, one that Bergson characterized as "the whole of memory... that passes over into each of these circuits, since memory is always present."[49] The past, as Deleuze observed, "preserves itself in itself (while the present passes)," and thus coexists not only with the present but, more profoundly, with itself in the state of dynamic virtuality or virtual multiplicity. Deleuze explains that

> in the past itself there appear all kinds of levels of profundity, marking all the possible intervals in this coexistence... Each of these sections is itself *virtual*, belonging to the being in itself of the past. Each of these sections or each of these levels includes not particular elements of the past but always the totality of the past.[50]

It is this entire entity of a pure past or pure memory that the notion of virtual image in Bergson's vocabulary points to. The virtual image is an image that holds the planes of past not actualized in representation. It, in other words, holds the coexistence of the past with itself in the mirror or as a shadow that haunts every present perception.

In Bergson's philosophy, then, the virtual image encompasses in its ontological sense the planes of pure past but also, in its epistemological sense, how these may emerge as the matter of thought, pointing thus to the process of comprehending and giving expression to the world's temporal texture beyond the limits of representation. For Bergson, thinking about time means approaching it as the difference between two modes of images: the actual and the virtual image, the present and the non-representational past. What is the function of this difference in Bergson's philosophy? Is the image merely, as Bergson alluded to, a metaphorical element in his thoughts? Moreover, how does the virtual image relate to the moving image? To answer the latter question, in Bergson's terminology, the virtual image is a "mobile mirror" which incessantly "reflects" perception in memory. The virtual image is, in other words, a virtual moving image. It also seems that this kind of an image functions not merely as a metaphor in the philosopher's system but, rather, it signals a certain kind of direction of thought and the quality of the operations of thought – suggesting that the image plays a vehement cognitive role in Bergson's thinking.

This becomes clearer as soon as we notice how Bergson's discussion on time and virtuality shares the same problematics that were developed in the previous chapters with regard to Sigmund Freud and Friedrich Nietzsche: the repetition of time which the moving image transposes in its aesthetics, as we have seen with the various examples from Léonce Perret's Le mystère des roches de

Kador and Stellan Rye's The Student of Prague to Joris Ivens's The Bridge. We have witnessed the moving image emerging as an aesthetic and noetic rhythm that comprehends the past as a dynamics of differential potential. In this respect, Bergson's notion of the virtual image specifically recapitulates the problem of the differential image that appears in Nietzsche in the sense that both notions embody the forces, becomings and tendencies internal to the constitution of "things." For Bergson, things and beings should be approached as constellations of temporally qualified potentialities. Following Deleuze, in Bergson's philosophy "the *object itself* merges with a *pure* virtual perception."[51] From this perspective, it may be suggested that the moving image intimately relates to Bergson's thinking about memory, time and virtuality – to how memory and time become thinkable as a virtual image. The virtual image indicates certain tendencies or differential relations directing Bergson's thought itself. It signals the image that directs Bergson's philosophy, or what he considered an "image, close to intuition, which the philosopher may need for himself and which often remains unexpressed."[52]

Continuum

Another crucial concept we should take into consideration regarding visuality, time and virtuality in Bergson is that of duration. In Bergson's definition, duration consists of the splitting of time as explained above. It is not simply characterized by succession but, more profoundly, by coexistence. Furthermore, duration is essentially what determines things. That is, the philosopher sees the nature of things as durational, which also amounts to the fact that things start to appear ephemeral and momentary – like the Brownian movement particle that has lost its rigid identity over time. A central problem in this regard concerns how to think about the continuity of a thing, a problem regarding the nature of the continuum, identity and difference. It is here that the notion of a dynamic virtual image also appears as an essential aspect of Bergson's philosophy.

Essai sur les données immédiates de la conscience (1889) already addressed the problem of how things become temporally constituted and how to qualify the relations according to which "objects" are determined through the concept of multiplicity. Here Bergson distinguished between quantitative and qualitative multiplicities, which Deleuze later called actual and virtual multiplicities.[53] These resonate with what was earlier termed the actual and virtual image, or representation and pure memory.

Quantitative multiplicities are distinct and homogeneous. They are composed of discrete elements that are related to each other according to specific terms, especially juxtaposition and exteriority. They encompass "abstract unities," spatial determinations within which categories of understanding are imposed upon the real and the world is organized so that it becomes something uniform, regular and calculable. Meanwhile, qualitative multiplicities are by nature heterogeneous and continuous. They cannot be divided without their changing in kind. Their elements or components cannot be juxtaposed and made discrete and calculable, which is why the multiplicity is non-numerical. Bergson considered it crucial that a qualitative multiplicity unfolded in duration and not in space.

As an example of an actual multiplicity Bergson mentioned a flock of sheep, which is a unity containing a number of parts or "points" which can be separated from each other by positioning them in space according to measurable intervals.[54] The multiplicity may be represented by a symbol (e.g. "15"), and divided without it changing in nature. Bergson contended that it is basically arithmetic that teaches us to compose a multiplicity of discrete parts. A number is a unit (one) and simultaneously a collection of discrete units (many). As such, it generates the "cinematographical illusion" of an object (one in many, a collection of identical parts) and simultaneously conceals the real constitution of things. More generally, the quantitative multiplicity is a "thing" made visible in representation and unified as an object of actual apperception, an object constructed especially by language and the symbolic mode of intelligence.[55] According to Bergson, it is expressed in an "extended image" (*image étendue*).[56] This description points in particular to alphabetic or numeric symbols that form a "symbolical image of real duration."[57]

A characteristically pressing question in Bergson's philosophy is how the world can be expressed and thus becomes thinkable beyond the limits of symbolic reasoning. In this respect, Bergson's treatment of the qualitative multiplicity in *Essai* involves a specific notion of the moving, dynamic image. Bergson defines the qualitative multiplicity as being temporal by nature. It is heterogeneous, involves a continuity in time, and it does not divide in degree but only in nature. If an element is added to it, the whole constellation changes. The qualitative multiplicity entails duration as "mutual penetration, an interconnexion and organization of elements, each one of which represents the whole, and cannot be distinguished or isolated from it except by abstract thought."[58] Crucially, Bergson described duration in terms of "images" which interpenetrate one another and are continuously in progress and modulation, so that they cannot be juxtaposed in space or reduced to an "extended image." Instead, images become not many but other.[59] The qualitative multiplicity is virtual in contrast to the quantitative multiplicity that is completely actual, meaning that new ele-

ments can be added to or subtracted from the latter without causing any change in kind. One could argue that the qualitative multiplicity is a thing conceived via its potentialities, encompassing a viewpoint from which the reality of things is "touched, penetrated, lived" and the qualities of matter are known "*in themselves*, from within and not from without."[60] Bergson argues that qualitative multiplicity is embodied in an "image of pure duration" (*image de la durée pure*). It does not find its expression in images juxtaposed in space but in the "indistinct" movement of images that gives rise to a perception that Bergson characterizes as the vision of "one [image] in the other, each permeating the other and organizing themselves like the notes of a tune, so as to form what we shall call a continuous or qualitative multiplicity with no reference to number."[61]

While signaling the operations of time, this characterization fundamentally anticipates the notion of the virtual image emerging in *Matter and Memory*. However, in *Essai* Bergson, close to Edmund Husserl, understands that duration is an aspect of synthesizing consciousness, and he couples the virtual multiplicity with the domain of the subject and phenomenological, even psychological, enquiry. Yet in his later work Bergson attempts to overcome this attribution as well as to break down the form/matter distinction structuring the account of the relation between mind and the world.[62] The image of pure duration is not an image in consciousness that can be explained in phenomenological terms. Instead, it touches the internal constitution of things themselves, duration being the "very substance of the world."[63]

Let us have a look at the genealogy of Bergson's notion of multiplicity regarding the nature of this image. The notion, as Deleuze pointed out, can be seen as based on the mathematics of, most notably, Bernhard Riemann.[64] In this sense, "multiplicity" or "manifold" (*Mannigfaltigkeit*) designates a geometrical space with certain characteristic properties and belongs to the differential geometry as developed by Friedrich Gauss and Riemann during the nineteenth century.[65] Significantly, a new concept of space was generated within these developments. By eliminating global embedding, e.g., Euclidean space as a fixed point of reference for geometrical objects, these objects – such as surfaces, for instance – could be studied for their local properties, thus establishing a conception of a surface as a space in itself. Gauss only studied two-dimensional surfaces, while Riemann tackled N-dimensional surfaces, that is, abstract spaces with a variable number of dimensions that could be defined without referring to a higher dimension (N+1). The term manifold originally meant these multi-dimensional spaces. Thus, the philosophical problem rooted in the notion of manifold and also in that of multiplicity, consists of determining objects through their intrinsic, independent properties and in the absence of any supplementary, extrinsic dimension or defining unity. The manifold embodies the organization immanent to the multiple as such.

Riemann distinguishes between two kinds of manifolds.[66] Discrete manifolds are composed of single, isolated elements. They contain the principle of their own metrics, so the measure of one of their parts is based on the number of elements they contain. Continuous manifolds, on the other hand, are in principle non-metric and can be defined without referring to a unifying metrical system. They encompass continuous variation, which amounts to surfaces being irregularly shaped so that a figure cannot be moved around without changing its shape and other properties. Figures, in other words, cannot be apprehended without considering their relation to the accidents that happen to them. They become, by nature, changeable and processual, while hylomorphic assumptions regarding matter embodying unaffected forms begin to scatter. In this way, Riemann's exploration of continuous manifolds contributes to the perception of change itself, without having to refer to an immutable substance as the support for change.

Bergson emphasized that one should not "solidify into discontinuous images the fluid continuity of the real."[67] Crucially, modeling this continuity by investigating the more-than-three-dimensional spaces also emblematized early twentieth-century explorations in the visual arts and, accordingly, reconfigurations of visuality as manifested by the experiments of the cubists and futurists.[68] These revolved around the apperception of figures and forms as they appeared to exceed the "natural" perception of three-dimensional space that characterizes solid forms. This involved the deconstruction of their indeformability as implied by Euclidean geometry, so that figures and forms, in one way or another, became harnessed as potentially changing and in terms of movement and temporality according to higher dimensions that allow malleability and "smoothness." Albert Gleizes and Jean Metzinger stated that in cubist painting, form "is tempered or augmented by contact with another form, it is destroyed or it flowers, it is multiplied or it disappears. An ellipse may change its circumference because it is inscribed in a polygon."[69] Metzinger even discussed how in Georges Braque's works the picture "is no longer a dead portion of space" but "the total image radiates in time."[70] This suggests how the visually determinable synthesis or, rather, a continuum of multi-dimensional elements is attained in time, in duration – not, however, simply in succession but within a certain kind of simultaneity.

Now, the question concerns how simultaneity is conceived, as something spatial or exclusively temporal such as in Bergson's notion of duration or the virtual image (qualitative multiplicity). According to Linda Dalrymple Henderson, temporality in the early cubist movement only functioned in a supporting role, "allowing the artist or geometer to accomplish the physical or mental movement necessary to form an idea of an object's total dimensionality," so that simultaneity ultimately became spatial juxtaposition.[71] The Italian futurist move-

ment offered another kind of understanding in which the cubist metrical and finite grid was transformed into the study of "force-lines" or dynamic systems of vectors. Umberto Boccioni, explicitly following Bergson's philosophy, introduced the notion of dynamic continuity, which was not based on the succession of discrete instants but was instead "a continuous projection of forces and forms intuited in their infinite unfolding," presenting a "form in motion which appears for a moment only to be lost in the infinite succession of its variety."[72] Dynamic continuity is a "unique form," which, one could say, indicates virtual tendencies that direct the unfolding of forms in three dimensions. As Henderson argues, Boccioni asserted "the positive value of time and motion as the most effective indication of a higher, dynamic reality."[73] In this way, Boccioni's view parallels Bergson's view, especially in the sense of how it approaches things in terms of intensities and becomings, and, as Sanford Kwinter points out, in the attempt of giving "systematic expression to the world in the modern terms of a *continuous multiplicity*."[74]

Bergson, in applying Riemann's distinction between discrete and continuous multiplicities, substantially changed its definition. Bergson believed that continuous multiplicities did not belong to N-dimensional spaces but existed exclusively in the domain of duration.[75] This view coincides, at least to some extent, with the emergence of cinema and the medium's novel visual arrangements that, following the early theoretical writings on film, reverse the order of space and time so that figures begin to appear as essentially temporally constituted. Élie Faure, who considered the moving image as something that inaugurated a new vision of the world, or actually a new metaphysics, summed up the argument by noting that the cinema projects duration onto space.[76] This signals a dismissal of Cartesian space in favor of a perception of the world in terms of dynamic continua. Most importantly, and in accord with Bergson's view, the disclosure of this "florid reality" reveals time as anterior to and even constitutive of space. On the other hand, Jean Epstein, as Malcolm Turvey has noted, directly incorporated a number of Bergson's ideas into his theoretical writings on cinema that he also put into practice in his films, emphasizing cinema's capacities to transcend the limitations of human perception in envisioning duration and continuity.[77] Epstein believes what is unique about cinema's perception is that it is not simply confined to the psychological dimension with its rules and restraints but, instead, has a morphogenetic potential of its own. Epstein writes that "the film stock also contains an idea of a form, an idea established independently of my awareness, an idea without awareness, a latent, secret but marvelous idea."[78] Turvey points out that Epstein's approach to film is based on a certain "logic of embodiment" according to which, immaterial entities become incarnated in the texture of the image and are thus corporeally experienceable as well as thinkable.[79] Cinematic perception, in Epstein's theory, amounts to no-

vel ways of thinking about objects, especially a new conception of the world's temporal texture and the nature of time as duration and flow.

Let us now investigate this notion that the moving image frames and also reveals a specific relation to time in a different context than that of the early French theories. In the early 1920s, Hans Richter and Viking Eggeling began to systematically explore the contrapuntal, dynamic arrangements of forms as well as the growth of forms in various settings. Richter explained how his and Eggeling's experiments at some point led to the problem of continuity, one that could only be resolved by translating "dynamic tensions into kinetic movements." This translation was achieved by employing the cinematograph, since, as Richter wrote, "there was only one way to express dynamic energies as kinetic motion, and that way was with film."[80] According to him, the basis of film is a new sensation of rhythm and, accordingly, not simply the "orchestration of form but the orchestration of 'time', and time alone." Cinema allowed Richter to distort and dissect an object in a temporal dimension and to reconstitute it "in cinematic terms (just as the cubists dissected and rebuilt the object in pictorial terms)."[81]

The exploration of the temporal constitution of forms is central to Richter's *Rhythmus* films. Rhythmus 21 (1921) leads first of all to the deconstruction of clear-cut distinctions between the figure and the ground as well as the creation of a rather complex sense of depth. In the first part of the film, the deconstruction occurs by alternating with white figures (squares and rectangles perpendicular to the frame) and a black background on a "flat" surface, which allows the white figures to emerge from the background and gradually disappear or alternatively fill the frame as they become the background on which, in negative footage, black figures begin to swell and shrink. Secondly, through this sudden, pulsating swelling and shrinking of forms, Rhythmus 21 studies the change within the figures themselves as well as how an action of a figure produces a reaction and thus changes in other figures. In this manner, the film presents a constellation of constant variation between and within forms, "a dynamic and polar arrangement of opposing energies... one thing growing, another declining, in a creative marriage of contrast and analogy."[82] The film thus spawns, as its title suggests, a certain kind of rhythmic constellation, a constellation in which the "pure" rhythm of the evolution and change of forms is focused upon. This rhythm is quite saccadic, and the relations of the film's affective and kinesthetic tonality (black/white, small/large, fast/slow, left/right, up/down) are comprised of erratic "jumps" and variations: stop-motions, changes in speed as well as directions of movement, and simultaneous multiple figures of different rhythms and directions of movement, that is to say, multiple durations, which act upon each other. Despite these variations and jumps, however, the film's rhythm and visual world are based on a basic principle of formation or, in Boc-

cioni's terms, "unique form," which is the evolution and disappearance of black and white squares and rectangles.

In a manner that is reminiscent of Bergson's characterization of the image of pure duration (in which images merge with each other like the notes of a melody), Richter states, "The single image disappeared into a flow of images which made sense only when it successfully articulated a new element: Time."[83] The film is an experiment in morphogenesis that expresses time as an essential element of creation and differentiation, and studies figures as elements embedded in the continuum of duration. In this sense, Rhythmus 21 presents a constellation that perceives forms and figures as passing in the present from within their internal constitution, according to virtual planes of the past, in other words, qualitative multiplicities that shape the ways in which forms and figures become realized. Through its rhythms, the film strives to emphasize the virtual dimension that embodies the appearance and disappearance of figures. In other words, it strives to approach the figures from the viewpoint of their formation, to present them as dynamic continua, virtual multiplicities – and, paraphrasing Bergson, to adopt the mobile continuity of things.[84]

This perception of forms and figures as durational, as we have already noted, characterized Bergson's thinking which was that the non-metric, continuous or virtual multiplicity is essentially temporal by nature. We can see how Bergson's thinking, in this respect, coincided with the rhythms of the moving image, as emblematized by Rhythmus 21. The film embodies a mode of perception that is isomorphic – or rather, "isomorphologic" – with the perception that guided Bergson's philosophy. Whereas Rhythmus 21 exceeds representation in its apprehension of the temporal constitution of forms, Bergson's philosophy is framed on a perception *sub specie durationis*, that is, a vision of the world "as it really is, not superficially, in the present, but in depth, with the immediate past crowding upon it and imprinting upon it its impetus."[85] This is a mode of vision that captures multiplicities of temporal forces, which give rise to the optical. From this viewpoint, one is not limited to apprehending things according to the dialectic of representation but more profoundly, one is able to make sense of the virtual coexistence of diverse layers of time that is enfolded in each fleeting present moment. From this unique perspective of the virtual image, the world is apprehended, to quote Bergson, in terms of "a memory within change itself, a memory that prolongs the before into the after, keeping them from being mere snapshots and appearing and disappearing in a present ceaselessly born."[86]

Intuition

It becomes evident how Bergson's notions of the virtual image and the image of pure duration were historically and problematically intertwined with the emergence of cinema. Bergson's thinking about the continuum of duration and the internal constitution of things in terms of virtual multiplicities is partly directed and qualified by the rhythms of the new medium. One could say that it is the moving image that becomes what Bergson describes as the "receding and vanishing image, which haunts, unperceived perhaps, the mind of the philosopher, which follows him like his shadow through the ins and outs of this thought."[87] Bergson's metaphysics, in this respect, even seem to be based on the kind of a dynamic image that relies on cinema's powers to articulate things in time.

Another term for the noetic apprehension of the world's temporal fabric is intuition, which Bergson contrasted with the linguistic and symbolic mode of intelligence. According to him, it is intuition that allows the world to get directly considered from within a temporal viewpoint. Intuition is a mode of knowledge, which does not fall into a perspective based on representation but relates to things and beings according to their virtual images. In intuition, Bergson writes, "movement will not be grasped from without and, as it were, from where I am, but from within, inside it, in what it is in itself."[88] As such, the philosopher warns us not to confuse intuition with instinct or emotion. Intuition is a mode of attentiveness, an indivisible (simple) mental act of the apprehension of duration – "the *sympathy* by which one is transported into the interior of an object in order to coincide with what there is unique and consequently inexpressible in it."[89] Intuition, one could say, involves a certain kind of affect (sympathy) that coincides with the affective tonalities proper to things and beings themselves and thus opens thought to their interior durations.

Bergson considered intuition to be thinking in terms of duration. It attains pure variation and change by putting thought into contact with multiplicities of complementary durations (inferior and superior to ours) that are apprehended in mental acts corresponding to "all degrees of being."[90] What is interesting here is how Bergson associated intuition as a specific type of mental act with images that dynamically interact with each other:

> The image has at least the advantage of keeping us in the concrete. No image will replace the intuition of duration, but many different images, taken from quite different orders of things, will be able, through the convergence of their action, to direct the consciousness to the precise point where there is a certain intuition to seize on.[91]

Here Bergson gives the moving image a lot of epistemological weight, as it is articulated as being capable of directing consciousness outside of itself and inside the world.

Can we then talk about intuition and sympathy (in the above-mentioned sense) in the context of cinema? The early film theorist, Émile Vuillermoz, came close to describing such a mental act in film. The cinema, Vuillemoz writes

> can, in its own way, make inanimate objects speak and give laughter and tears to things. It knows, equally, how to draw an affecting harmony from a human face, effects of an extremely subtle power and charm. It lays out the whole gamut of expressions of trees, clouds, mountains, and seas. No element of beauty or passion is shielded from its penetrating glance. It can suggest, evoke, cast a spell; it can effect audacious associations of ideas through the rapprochement of images. It can mix up visual counterpoints with an irresistible force, impose harsh dissonances, or hold major chords.[92]

Vuillermoz's description is laden with metaphors, but still manages to summarize something critical about the "glance" or the visual constellations that cinema draws from the world, which allows things and beings to be expressive in a particular way, developing from affective tonalities to noetic connections. This comes close to the dimension of experience that Daniel Stern described in terms of vitality affects (see chapter 3). But, for Vuillermoz, the affective charges that cinema enacts do not only concern interpersonal relations but also include the world of objects, rendering their surfaces and movements as sensible and giving them quality. In Vuillermoz's treatment, cinematic perception starts to achieve a certain ontological weight, one that is due especially to the medium's capacity to gather disparate perceptions and moments into specific qualitative constellations. Vuillermoz claims that, via the temporal textures it weaves, cinema constitutes an intensive "super-reality." This is not the world as we remembered or anticipated it but rather a world that we see anew. The movement of images, one could say, develops into an act of sympathy, an affective investment that exposes reality in the process of the world's becoming qualitative in one way or another.

To turn to our filmic example again, Richter's Rhythmus 21 also embodies a similar kind of noetic act in its rhythmic compositions that puts us into contact with the continuity of durations from which various forms emerge. By animating figures and placing them in situations of dynamic interaction, variation and transformation, the film explores affective tonalities and rhythms of being, opening consciousness up to the interior of these forms in the sense that our thinking might coincide with something that is unique to them. Instead of producing abstractions, the film brings us back to the concrete and through its affective rhythms transports us from extensity to the intensive realm of duration.

One thing to note about Rhythmus 21 is that it lacks explicit cuts that would break up the flow of these rhythms, in other words, editing in the sense of articulating time into a particular order. Doane pointed out that film editing developed into a technique to orchestrate cinema's inscription of time in the early 1900s, and to invent a coherent relationship to filmic time and space, converging thus with the establishment of psychological and social orders in modernity based on mobility, flux and exchange.[93] In her discussion of the three systems of logic that governed early film editing – repetition, chase, and suspense – Doane considers the cut to be a technique that regulates the over-presence of time and, consequently, the materiality and contingency inherent in the moving image, in terms of manipulating, narrativizing and ultimately commodifying temporality. In this respect, to follow Bergson's vocabulary, one could say that editing was a technique used to encapsulate material variation and movement into a representation and draw a symbolic image of duration. Sean Cubitt follows a similar line, when he claims that "the cut defines the term and the terms of objection, transforming raw perception into an object of consciousness, establishing the object as a perception of which an 'I' is conscious."[94] The cut establishes recognition, turning the sensation of an event into an ordered apperception. Cubitt contrasts this with an element of filmic expression he calls "the vector," one that does not organize sensation into representation but aligns it with the uncertain steps of other modes of thinking.

Cubitt's prime example of this kind of "vector cinema" is Émile Cohl's line animation Fantasmagorie (1908) in which the puppet, Pierrot, and his environment continuously undergo transformations. Cohl was one of the first to experiment with animated film, and his "Fantoche" films are a truly unique representative of the early stages of this technique, emphasizing the free play of cinematic transfiguration beyond habitual ways of regimenting time and space.[95] In Fantasmagorie, Euclidean space gives way to a flat space without depth where forms are caught in continuous modulation as the effects of a moving line or diagram. For example, the puppet gets stuck in a bottle, which turns into a flower that, while it is blossoming, releases the puppet from its heart; the flower transforms into the nose of an elephant, which again turns into the outside wall of a building, and so on. The written description of the film does sound rather absurd, since the transformations do not seem to follow any particular logic other than that of the movement and flow of the line itself. The focus here is on the process of becoming instead of the metamorphoses between two or more ready-made forms, the moments of transformation between recognizable shapes. Cubitt notes that it is the activity of the line that counts rather than the end points, an activity that plays on indeterminacy: "[T]he vector provides the transformative principle in the frame itself, so every moment of every frame is the result of a unique transformation that might have come out differently."[96]

As a dynamic surface of continuous transformation, the image becomes a play of pure kinesthetic forces and becomings with contingent effects. Unlike the cut that establishes finality and definition in terms of recognition (what has become), the vector image instead emphasizes process and temporal openness. For Cubitt, it is comprised of beginnings, not endings.

In contrast to early cinema's ways of organizing time through editing, FANTASMAGORIE gives rise to a perception that emphasizes uncertainty and is neither unconscious like in a dream nor conscious in the sense of something having representations. We witness the line's becoming, momentarily enjoying the possibility of recognition until the figure changes again. Like intuition, the vector verges on the ambiguity of naming. The flow of images requires no interpretation. Instead, as Cubitt argues, the "animated vector depends on our synthetic participation in its becoming, on the viewer's temporality (and on the apparatus's)."[97] Cubitt draws on semiotics to describe the film as an expression of signifiers that stimulate communication and intersubjectivity. The surfaces of transformation that the activity of the line effects can, however, also be seen as influencing ontological perception beyond the logic of the sign, which implies a gap between appearance and essence, mind and matter. Instead, the animated vector can be considered in terms of a virtual multiplicity, as a continuous variation that becomes actualized in a myriad of fleeting forms. By emphasizing intervals of movement instead of endpoints, change rather than stable forms, FANTASMAGORIE focuses our attention on the line as an indivisible and unique tendency of becoming that generates processual variations on the screen. In this respect, when it comes to the film's cognitive dimensions, FANTASMAGORIE generates a *sympathetic* participation in the constant becomings, kinesthetic forces and affective dynamics that make up the film's world. Instead of interpretation or recognition, the moving image here draws on sympathy as an indivisible mental act of comprehending duration and, consequently, of grasping the film's world – and, in addition, the world that the film's world implies – as open and undecidable. The vector can be understood as a virtual image, that is, an image that belongs to both thought and reality as the ontological sense that determines both. More precisely, the vector can be understood as a virtual image by which the world is viewed as contingent, indefinite and continuous. This suggests a particular mode of immanence and an embeddedness of thought in reality because, in contrast to transcendence that follows from finitude, immanence, just like the animated vector that always begins anew, signals infinitude.

The activity of the line is beyond representation in the sense of a presentation of the same reality again. The world is not given but is being made. From yet another viewpoint, FANTASMAGORIE confirms the notion that repetition creates difference in cinema. The activity of the line simultaneously amounts to the indivisible mental act that Bergson calls intuition. It is in this way that the moving

image yields thinking – by animating the world and bringing us back to the concrete, the unique and the undecidable through its vectors. When it comes to the epistemological problematic involved in this argument, it is less important to ask whether cinema is more or less than reality than to acknowledge that it is one kind of perspective among several others, but one that is specific in its expressiveness of and relatedness to the world. It can thus be argued that the cinema is capable of embodying a particular mode of the world's emergence in thought, bearing in mind that thinking, as Bergson reminds us, is about relating to the world in the sense of giving it due expression. In this respect, while the act of representation concerns the separation between the body/mind and the world that is necessary for our practical and finite lives, the act of intuition instead embodies the immanence of thought and diverse durations of being. In other words, whereas in the act of representation, the sensorimotor schema actualizes a given plane of memory in view of successful action, in the act of intuition, thought is haunted by other virtual planes and by rhythms of duration we have never confronted in experience. These planes encompass durations that have never been presented to us. They are lives we have not lived, perceptions we have not perceived. Potentially, at least, the moving image is the incorporation of these other pasts. This is based on sympathetic noetic movement that marks a transition from extensity to memory, which, we need to emphasize, is not a question of psychological recollection but of ontological memory and the continuity of durations that the cinema can transpose within its aesthetics. Cinema, then, is the world viewed anew.

Conclusion

In part 1B "*Une histoire seule*" of Histoire(s) du cinema (1989-1998), Jean-Luc Godard shows for a few seconds a still image from D.W. Griffith's Way Down East in which Lillian Gish is lying exhausted and half-conscious on an ice floe in a river. In Godard's hands, this affectively charged image becomes a fragment removed from the representational and emotional logic of Griffith's film, and becomes associated with other visual and auditory elements drawn from cinema and surrounding cultural and artistic contexts. We hear the audio recording of Sigmund Freud's interview on the BBC in 1938 interwoven with Godard's voice-over inquiring: "But what is the difference between Lillian Gish on her ice floe and Augustine at Salpêtrière?" Simultaneously, the still from Way Down East alternates with a detail from André Brouillet's painting "Un leçon clinique à la Salpêtrière" (1887) that shows Jean-Martin Charcot lecturing and Marie Wittman, one of Charcot's famous hysterical patients, semiconscious and supported by an assistant (Joseph Babinski). This is followed by a cut to a detail from the photograph of Augustine, another famous patient of Charcot's, on a bed with her tongue hanging out. These images are underscored with the text: "*avez vous rien vu de tel, miss Lillian? / jamais mister Griffith / jamais mister Griffith*" ("Have you ever seen anything like this, Miss Lillian?" / "Never, Mister Griffith").

With polyphonic constellations consisting of the image, written and spoken word as well as sounds and music, Histoire(s) presents the moving image as an event that implies in its very constitution not only the filmic reality it belongs to but also larger configurations of aesthetic, social, technological and political forces. In a few seconds a frozen fragment from Way Down East is made to illustrate the perception of the body and the unconscious emblematic of what has become of our understanding of ourselves in cinematic modernity. Histoire(s) conceives of the moving image as something charged with a great deal of epistemological and ontological weight, a concept that has also been the guiding inspiration of this book. This entails a relational take on images as plotting movements, connections, affects and thoughts. Jacques Rancière points out that in Histoire(s)

> images become event-worlds that coexist with the infinity of other event-worlds that belong not only to all other films but also to all other forms of illustrations of the century; they become susceptible to striking an infinite number of relationships amongst themselves as well as with all the events of the century.[1]

For Godard, the history of cinema is not simply about the stories cinema has told but also about the world(s) it has implied, and his project can be seen as being focused on *dedifferentiation* of those differentiations, the modes of individuation, that the cinema has produced since its earliest days. In Histoire(s), images and sounds become more than just fragments but kinds of diagrams of the fabric that the video work weaves through the montage of the twentieth century and the forms of perception, emotions, conceptualizations and historical events the moving image involved and influenced. Godard understands cinema as something that began as a dream, however, not in the sense of producing untruthful distortions but in the sense of an immanent manifestation of the forces, imaginations and motivations that drive our actions and thoughts. In his melancholic vision, however, this dream turned into a nightmare in the form of two world wars that shaped the entire twentieth century. There may be many reasons for this, according to Godard (and his commentators), one of those being, as Rancière notes, the fact that cinema quickly became a great desiring-machine, an industry of sex and death in the style of Hollywood, which sold the world as a fantasy that is comprised of two principal elements, women and guns.[2]

Retrospectively speaking, one might then speculate that in the moving image, the death drive, the destructive force of repetition, is always lurking around in one way or another.[3] This is not opposed to what has become of "life" in our biopolitical societies in which the cinema, as we have argued, is one of the major technologies of power that conflate the intimate fact of living with the political realm. Following Roberto Esposito, the biopolitical securing and "immunization" of the continuity of life often takes place via the production of death, through the destruction of that which is considered threatening and contagious with respect to the living being's integrity and individuality.[4] This already follows from Xavier Bichat's definition of life as "the sum of functions by which death is resisted," which considers death as the negative but simultaneously necessary implication of the living, as its fundamental "other." We have seen that cinema emerged as a technological automation of this elementary principle of reaction – thus also implying a space of death in its very mechanics. The technological medium takes hold of the "lost time" in its rhythms between action and reaction, that is, the time it takes for the living being to process incoming stimuli and produce a proper response. Based on this elementary modulation, the medium individuates sensorimotor circuits in which the visual field corresponds with particular affects and actions, ones that have subsequently become common capital in the worlds we pay for in the movies.

Chapters 1-3 traced how the moving image developed in terms of the "care" of affective life and unconscious automatisms in the biopolitical context, meshing the living with the mechanical to make it calculable and reproducible. We

have analyzed this development as a three-fold process: (1) the establishment of a proper plane of reference with automatic self-recording machines in experimental physiological and psychological laboratories (knowledge, chapter 1); (2) the configuration of a novel form of life, experimental life, within this referential framework (power, chapter 2); (3) the emergence of a technological media environment or *Umwelt* in which this form of life is maintained as well as specific types of living beings individuated (sensation, chapter 3). Generally speaking, cinema is considered a technology of individuation that captures the living and its psychogenesis, a technology that encompasses fragmentary and pre-individual perceptions and affections, which gradually achieve form and meaning to become differentiated, and also immunized as functional sensorimotor wholes. In other words, the cinema begins as a nervous gesture, as an energetic and affective charge, that develops into various kinds of corporeal arrangements that are subject to annexation, control and preservation. In this sense, there is indeed no difference between Lillian Gish on the ice floe and Augustine at the Salpêtrière because the corporeal crisis expressed by the hysterical body, which is emblematic of biopolitical modulations of the living, is reconciled in cinematic worlds that establish new forms of psychophysiological consistency and agency, as Griffith's Way Down East exemplifies.

It is the concept of *Umwelt* that is especially linked to the problematic of cinema as the industry of sex and death that Godard's Histoire(s) du cinéma outlines. *Umwelt* encompasses a repetition that creates a finitude, which leads to the enclosure of the living in a protective and insulated sphere of sensations. Jakob von Uexküll described *Umwelt* as an "island of the senses," something similar to armor: "Around us is a protective wall of senses that gets denser and denser. Outward from the body, the senses of touch, smell, hearing and sight enfold man like four envelopes of an increasingly sheer garment."[5] What Uexküll's description implies is an individual – or a community of individuals – that is constituted as it protects itself, becoming in this process immune to outside influences. Ernst Jünger observed a similar kind of immunization emerging during World War I and the first examples of mechanized warfare in which a mode of technologized and forcefully cinematic sensibility and perception became the norm.[6] Jünger postulates that in the objectified sphere of modern technological media, the senses become paralyzed and the old feeling of self and memories disappear, giving way to a disciplined and uniformed body that is insensitive to injury and pain.[7] From this perspective, the cinema indeed implements what Esposito calls "an immunitary short-circuit" that is "destined to close the 'political body' on itself and within itself in opposition to its own outside."[8] The cinema is not just about the fragmentation of the sensorium but, more crucially perhaps, about conflating being and existence in its aesthetics and the consequent privatization of life into indivisible subjective worlds. The

cinematic individual becomes enclosed within itself and fixed within its own phantasms (circuits of affection-action) like those that are built upon the two great objects of desire: sex and death. It is this enclosure of the living that we have identified as the first principal diagram of the moving image, which addresses the medium's socio-technological functions in biopolitical modernity.

However, from a viewpoint that is at odds with the biopolitical diagram, we have also seen how the ramifications and mutations of cinema through its various layers pertain to realities that exceed the perception confined within individualized interiority. The moving image implies rhythms that no longer manipulate the temporal delay between action and reaction but amount to a disclosure of the dimension of non-linear folds of time and qualitative continua. One encounters these rhythms in the scene of the white screen in Léonce Perret's Le mystère des roches de Kador, for instance, in which the visual is disturbed by virtual forces, that is, forces of the outside. The scene emblematizes how cinematic repetition not only entails enclosure and finitude but it can also create difference within the individual, produce differentiations by which new realities in perception emerge. The shot that frames Suzanne's gestures and posture as she recoils from the screen in front of her can be considered, to borrow a concept from Stanley Cavell, a "somatogram" that traces psychic depths, especially thinking, to be the emotionally violent return of memory and the past on the bodily surface.[9] In this temporal opening, the film-within-film scene portrays cinema's power to reveal and also cure what Cavell calls the "metaphysical restlessness of the live body," a restlessness that manifests in Suzanne's loss of memory and bearings in thought.[10]

The scene in Kador shows cinema to be an automatism that fundamentally regenerates the potentiality of both memory and thinking. Following this cue in mapping the event of the moving image, we have focused on several case studies that disclose how in circa 1900 cinema became a diagram of thought in terms of a new kind of opening and way of thinking, drawing not merely on films but also concentrating on philosophical and theoretical discourses from that same period of time that manifest the metaphysical restlessness concerning both ourselves and the world around us, which cinema animates. This, too, has been viewed as a three-fold process, corresponding to three concepts. First, the paradox-image exhibits how the moving image becomes what is unthought in thought and thus embodies a sphere of potential thought (chapter 4). In the case study of Sigmund Freud, the moving image appeared as the unthought problematical element of Freud's redefinition of ourselves as psychic beings and, consequently, the very potentiality of his actual thoughts about the new epistemic entity. Secondly, the differential image points to the conception of the ontological difference between things in their appearance and the event of appearing itself, that is to say, the difference between the actual manifestation of a thing

and its potential manifestations (chapter 5). This is already present (in terms of a paradox) in how Freud diverges from the neurophysiological context of his times, focusing his perceptions on psychic potential that cannot be located in the apparent visibility of somatic expressions. However, the differential image is especially manifested in the work of both Friedrich Nietzsche and Henri Bergson, as they attempted – whilst rearticulating the ontico-ontological distinction – to avoid recurring traditional notions of the substance or the immutable being and, instead, strived to think of the world as dynamic and temporally constituted, and conceive of things in their eventful and processual nature. It is the moving image that "differentiates" this attempt with regard to the disclosure of new kinds of temporalities in particular. As such, the moving image turns into the very capacity of this ontological thought on time and movement (chapter 6). It seems that within the moving image things are not trapped and defined in relation to an extrinsic framework (e.g., Substance or Subject). Instead, they are comprehended in terms of their internal becoming and generation, as fleeting figures that are always susceptible to changing but bear, nonetheless, a certain kind of sense that is marked by the world's innermost temporal constitution. This is the sense, immanent to the life of things themselves that the moving image may create and exhibit.

Overall, we could summarize that the moving image thus has a double composition. On the one hand, it projects a certain closure of action and subjective identity on its surfaces. On the other hand, it breaks through these boundaries and weaves a unique relationship with the ontological texture of the world. In other words, cinematic gestures mark psychogenesis in a double sense: first, they point to the individual as the result of techno-aesthetic modulations of affective life and actions, and, secondly, they encompass modes of thought that emerge as immanent to the world's becoming. However, one should be careful when considering the two diagrams mapped in this book as belonging to one single movement that the event of the moving image initiates. Instead of being hierarchically opposed to one another, they are in dynamic tension.

We have listed six concepts that reveal and analyze various aspects of these diagrams. The nature of this conceptual work has been constructivist in the sense that it creates a set of theoretically oriented perspectives rather than simply presenting a detailed portrait of the more or less narrowly limited historical period. When it is understood as something that pertains to creative relations and processes, the concepts expressed in this book may eventually be utilized – although certainly not in the same exact manner as was proposed here – when other historical periods and moving image media are the subject of further research. However, when it comes to digital images that characterize contemporary audiovisual cultures, it may be that they entail drastically different kinds of ontological and epistemological arrangements than the ones that have been

analyzed in this book, especially regarding the disclosure of change and qualitative durations in thought that the moving image produces. In his analysis of the digital image, David Rodowick asserts that, "the ontology of information … is insensitive to the qualities of things and thoughts."[11] Rodowick believes that the digital image is confined to the individualized present tense of controlling and managing information and cut off from the ontological relation with the past that the filmic image enjoys, and consequently, from cinema's immanence with uncertain realities that exceed information. In this perspective, the digital image of course develops into an *Umwelt*, which addresses biopolitical modulations of the living, although one that does not contain the germ of metaphysical restlessness that cinema embodies.

In any case, what the concepts developed in this book do map and disclose is the intensive threshold between the two tendencies that mark cinematic movement, one on which the fleeting contours of our being continue to be constantly drawn, and redrawn. This book has mainly concentrated on the ontological and epistemological issues regarding the rhythmic constellations and the images that surround and determine us. However, we have also paid attention to the political side in investigating how the technology of the moving image has contributed to processes of individuation characteristic of biopolitical modernity. What becomes particularly problematic from this perspective is the creation of new, alternative political gestures and modes of thought. If we are firstly defined by our potentialities to be affected and to think, in light of this book, any attempt to reconfigure and reaffirm these potentialities should have the moving image as its focal point. Passing from one tendency of the moving image to another may indeed be situated at the heart of struggles in politics and ethics. This involves especially the challenge of embodying gestures that are exposed to forces of the outside, which may ultimately restore the world to us in all of its intimacy and fullness. Following Bergson, we can understand this as an act of sympathy, one in which consciousness emerges, not in subjective isolation from the world, but in a fundamental openness toward the unique and the indefinite.

Notes

Introduction

1. See, e.g., Plato, *Meno*, in *Laches, Protagoras, Meno, Euthydemus*, transl. W.R.M. Lamb, Loeb Classical Library (Cambridge, MA: Harvard University Press, 1977), 97d.
2. See Gilles Deleuze, *Cinema 2: The Time-Image*, transl. Hugh Tomlinson and Robert Galeta (London: The Athlone Press, 1989), 156; original in *Cinéma 2: L'Image-temps* (Paris: Les Éditions de Minuit, 1985), 203 (henceforth, French pagination will be listed after the English).
3. On motion perception in the cinema, see Joseph and Barbara Anderson, "Motion Perception in Motion Pictures," in *The Cinematic Apparatus*, eds. Teresa de Lauretis and Stephen Heath (London: Macmillan, 1980), 76-95; Bill Nichols and Susan J. Lederman, "Flicker and Motion in Film," in *The Cinematic Apparatus*, 96-105.
4. Thus, as Deleuze argues, "[c]inema, precisely because it puts the image in motion, or rather endows the image with self-motion [*auto-mouvement*], never stops tracing the circuits of the brain." Gilles Deleuze, "The Brain is the Screen: An Interview with Gilles Deleuze," transl. Marie Therese Guirgis, in *The Brain Is the Screen: Deleuze and the Philosophy of Cinema*, ed. Gregory Flaxman (Minneapolis: University of Minnesota Press, 2000), 366.
5. Hugo Münsterberg, *"The Photoplay: A Psychological Study" and Other Writings*, ed. Allan Langdale, rev. and exp. ed. (London: Routledge, 2002), 84.
6. Martin Heidegger, "The Question Concerning Technology," in *Basic Writings: Martin Heidegger*, ed. David Farrell Krell, rev. and exp. ed. (London: Routledge, 1993), 307-42, quotation in 311.
7. Gilles Deleuze, *The Fold: Leibniz and the Baroque*, transl. Tom Conley (London: The Athlone Press, 1993), 80; original in *Le pli: Leibniz et le baroque* (Paris: Les Éditions de Minuit, 1988), 109 (henceforth, French pagination will be listed after the English).
8. Gilles Deleuze, *Foucault*, transl. Sean Hand (London: Continuum, 1988), 23-44; original in *Foucault* (Paris: Les Éditions de Minuit, 1986), 31-51 (henceforth, French pagination will be listed after the English).
9. Ibid., 32; 42.
10. Ibid., 35; 43.
11. Ibid.
12. Deleuze, *Foucault*, 43 (French).
13. Gilles Deleuze, *Cinema 1: The Movement-Image*, transl. Hugh Tomlinson and Barbara Habberjam (London: The Athlone Press, 1986), 59; original in *Cinéma 1: L'Image-mouvement* (Paris: Les Éditions de Minuit, 1983), 87 (henceforth, French pagination will be listed after the English).

14. Tom Conley, *Cartographic Cinema* (Minneapolis: University of Minnesota Press, 2006), 12.
15. Ibid., 13.
16. Mary Ann Doane, *The Emergence of Cinematic Time: Modernity, Contingency, the Archive* (Cambridge, MA: Harvard University Press, 2002).
17. Yvette Bíro, *Turbulence and Flow in Film: The Rhythmic Design*, transl. Paul Salamon (Bloomington: Indiana University Press, 2008), 35, 232.
18. Jean Mitry, *The Aesthetics and Psychology of the Cinema*, transl. Christopher King (London: The Athlone Press, 1998), 118-126.
19. Germaine Dulac, "Aesthetics, Obstacles, Integral Cinégraphie," transl. Stuart Liebman, in *French Film Theory and Criticism, A History / Anthology*, vol. 1, 1907-1929, ed. Richard Abel (Princeton, NJ: Princeton University Press, 1988), 389-97.
20. Ibid., 396.
21. Sergei Eisenstein, "Laokoön," in *Towards a Theory of Montage*, vol. 2 of *S.M. Eisenstein: Selected Works*, eds. Michael Glenny and Richard Taylor, transl. Michael Glenny (London: British Film Institute, 1994), 109-202, quotation on 130 (emphasis in original).
22. Mitry, *The Aesthetics and Psychology of the Cinema*, 125.
23. Jules Romains, "The Crowd at the Cinematograph," in *French Film Theory and Criticism, A History / Anthology*, vol. 1, 53.
24. Münsterberg, *The Photoplay*, 153.
25. Gilles Deleuze, *Francis Bacon: Logique de la sensation* (Paris: Éditions de la Différence, 1981), 31.
26. See Michael Cowan, "The Heart Machine: 'Rhythm' and Body in Weimar Film and Fritz Lang's *Metropolis*," *Modernism/modernity* 14:2 (2007): 225-48. See also Stephen Kern, *The Culture of Time and Space 1880-1918* (Cambridge, MA: Harvard University Press, 1983).
27. See Michael Golston, "'Im Anfang war der Rhythmus' - Rhythmic Incubations in Discourses of Mind, Body and Race from 1850-1944," *Stanford Electronic Humanities Review*, supplement 5: "Cultural and Technological Incubations of Fascism" (1996), http://www.stanford.edu/group/SHR/5-supp/text/golston.html (accessed November 11, 2008).
28. Thaddeus L. Bolton, "Rhythm," *American Journal of Psychology* 6:2 (January 1894): 145-238, quotation on 146.
29. See Golston, "'Im Anfang war der Rhythmus'." See also Anson Rabinbach, *The Human Motor: Energy, Fatigue, and the Origins of Modernity* (Berkeley: University of California Press, 1990), 172-78.
30. See Golston, "'Im Anfang war der Rhythmus'."
31. See especially Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, transl. Brian Massumi (Minneapolis: University of Minnesota Press, 1987), 310-50; original in *Mille plateaux: Capitalisme et schizophrénie 2* (Paris: Les Éditions de Minuit, 1980), 382-433 (henceforth, French pagination will be listed after the English). On rhythm in a related anthropological sense, see Michel Serres, *Récits d'Humanisme* (Paris: Éditions le Pommier, 2006), 34-59.
32. André Leroi-Gourhan, *Gesture and Speech*, transl. Anna Bostock Berger (Cambridge, MA: The MIT Press, 1993), 316. See also Serres, *Récits d'Humanisme*, 39-42.

33. For a similar conceptualization, see Jukka Sihvonen, *Exceeding the Limits: On the Poetics and Politics of Audiovisuality* (Turku: SETS, 1991), 86-89.
34. Thomas Elsaesser, "Kontingenz und Handlungsmacht im zeitgenössischen Kino," in *Unmenge – Wie Verteilt sich Handlungsmacht?*, eds. Ilka Becker et al. (Munich: Wilhelm Fink, 2008), 157-90. For a reconfiguration of the notions of movement and the perception of reality in contemporary film theory, see Tom Gunning, "Moving Away from the Index: Cinema and the Impression of Reality," *Differences: A Journal of Feminist Cultural Studies* 18:1 (2007): 29-52. Recently, several concepts have emerged in film studies that focus on a certain kind of dynamics or potentiality that is inherent in the moving image, corresponding thus to the approach of the notion of rhythm in this book. These include the concept of energy developed by Janet Harbord in the context of film aesthetics, the notion of figural visuality analyzed by David Rodowick, and the concepts of "rhizome" and the brain reinterpreted in film studies by Patricia Pisters. See Janet Harbord, *The Evolution of Film: Rethinking Film Studies* (Cambridge: Polity, 2007); David Rodowick, *Reading the Figural, or, Philosophy after the New Media* (Durham: Duke University Press, 2001); Patricia Pisters, *The Matrix of Visual Culture: Working with Deleuze in Film Theory* (Stanford: Stanford University Press, 2003).
35. Pisters, *The Matrix of Visual Culture*, 219.
36. Giorgio Agamben, "Notes on Gesture," in *Means without End: Notes on Politics*, transl. Vincenzo Binetti and Cesare Casarino (Minneapolis: University of Minnesota Press, 2000), 49-60.
37. Ibid., 50.
38. Pascal Bonitzer, "It's only a film/ou la face du néant," *Framework* 14 (Spring 1981): 23.
39. Serres, *Récits d'Humanisme*, 136-37. See also Deleuze and Guattari, *A Thousand Plateaus*, 60-61; 79-80.
40. Leroi-Gourhan, *Gesture and Speech*, 114-15, 230-55.
41. Ibid., 237.
42. Ibid., 238.
43. On Leroi-Gourhan's "biological philosophy of technique," see, e.g., Françoise Audouze, "Leroi-Gourhan, a Philosopher of Technique and Evolution," *Journal of Archaeological Research* 10:4 (2002): 289; Georges Canguilhem, "Machine and Organism," transl. Mark Cohen and Randall Chrerry, in *Incorporations*, eds. Jonathan Crary and Sanford Kwinter (New York: Zone Books, 1992), 61-62.
44. Audouze, "Leroi-Gourhan, a Philosopher of Technique and Evolution," 285-86.
45. Agamben defines the gesture in a similar manner: "Nothing is more misleading for an understanding of gesture... than representing, on the one hand, a sphere of means as addressing a goal … and, on the other hand, a separate and superior sphere of gesture as a movement that has its end in itself (for example, dance seen as an aesthetic dimension)... *The gesture is the exhibition of a mediality: it is the process of making a means visible as such*." Agamben, "Notes on Gesture," 58 (emphasis in original).
46. Brian Rotman, *Becoming Beside Ourselves: The Alphabet, Ghosts, and Distributed Human Being* (Durham, NC: Duke University Press, 2008), 19.
47. Walter Benjamin, "On Some Motifs in Baudelaire," in *Illuminations*, ed. Hannah Arendt, transl. Harry Zorn (London: Pimlico, 1999), 171.

48. Tom Gunning, "The Cinema of Attractions: Early Film, Its Spectator and the Avant-Garde," in *Early Cinema: Space, Frame, Narrative*, eds. Thomas Elsaesser and Adam Barker (London: British Film Institute, 1990), 56-62.
49. On this context, see also Francesco Casetti, *Eye of the Century: Film, Experience, Modernity*, transl. Erin Larkin with Jennifer Pranolo (New York: Columbia University Press, 2008), 111-40.
50. Rae Beth Gordon, *Why the French Love Jerry Lewis: From Cabaret to Early Cinema* (Stanford: Stanford University Press, 2001).
51. Lisa Cartwright, *Screening the Body: Tracing Medicine's Visual Culture* (Minneapolis: University of Minnesota Press, 1995).
52. Jonathan Crary, *Suspensions of Perception: Attention, Spectacle, and Modern Culture* (Cambridge, MA: The MIT Press, 1999), 13.
53. See especially Friedrich Kittler, *Gramophone, Film, Typewriter*, transl. Geoffrey Winthrop-Young and Michael Wutz (Stanford: Stanford University Press 1999). On Kittler's conception of technological media as operations of time manipulation, see Sybille Krämer, "The Cultural Techniques of Time Axis Manipulation: On Friedrich Kittler's Conception of Media," *Theory, Culture & Society* 23:7-8 (2006): 93-109.
54. Aristotle, *Politics*, transl. H. Rackham, Loeb Classical Library (Cambridge, MA: Harvard University Press, 1959), 1253a1-20.
55. Giorgio Agamben, *Homo Sacer: Sovereign Power and Bare Life*, transl. Daniel Heller-Roazen (Stanford: Stanford University Press, 1998), 7-8.
56. Michel Foucault, *The History of Sexuality*, vol. 1, *The Will to Knowledge*, transl. Robert Hurley (London: Penguin Books, 1998), 141-42.
57. Agamben, *Homo Sacer*, 4-9.
58. Antonin Artaud, "Reply to an Inquiry," in *Collected Works of Antonin Artaud*, vol. 3, transl. Alastair Hamilton (London: Calder & Boyars, 1972), 60.
59. Artaud, "Witchcraft and the Cinema," in *Collected Works of Antonin Artaud*, vol. 3, 66.
60. Gilles Deleuze and Félix Guattari, *What is Philosophy?*, transl. Graham Burchell and Hugh Tomlinson (London: Verso, 1994), 117-218; original in *Qu'est-ce que la philosophie?* (Paris: Les Éditions de Minuit, 1991), 111-206 (henceforth, French pagination will be listed after the English).
61. Noël Carroll has proposed the term "moving image" to avoid searching for the telos or the form of cinema, inherent in film theory since its beginnings, and clinging to notions and methods that have become obsolete at the latest in the "trans-media" situation of contemporary audiovisual culture. Evidently, the way in which we approach the notion differs from Carroll's, who has subsequently made extensive use of it in his analyses of film and emotion or film form, for example. What we adapt from Carroll, however, is the tendency to avoid essentialism and also the taste for the singular and the specific. See Noël Carroll, *Theorizing the Moving Image* (Cambridge: Cambridge University Press, 1996), especially 49-74.
62. The approach here is based largely on the ontology of difference that Deleuze puts forward in his philosophical work. See Gilles Deleuze, *Difference and Repetition*, transl. Paul Patton (New York: Columbia University Press, 1994), 168-221; original in *Différence et répétition* (Paris: Presses Universitaires de France, 1968), 218-85 (henceforth, French pagination will be listed after the English).

Chapter 1

1. Maxine Sheets-Johnstone, *The Primacy of Movement* (Amsterdam: John Benjamins Publishing Co., 1999), 136.
2. On the early accounts of film experience, see Stephen Bottomore, "The Panicking Audience?: Early Cinema and the 'Train Effect'," *Historical Journal of Film, Radio and Television* 19:2 (1999): 177-216.
3. Tom Gunning, "The Cinema of Attractions."
4. Vachel Lindsay, *The Art of the Moving Picture* (New York: Liveright, 1970), 53.
5. Friedrich Kittler, "Romanticism – Psychoanalysis – Film: A History of the Double," transl. Stefanie Harris, in *Literature, Media, Information Systems: Essays*, ed. John Johnston (Amsterdam: G+B Arts, 1997), 96-97.
6. On these traditions, see Laurent Mannoni, *The Great Art of Light and Shadow: Archaeology of the Cinema*, transl. and ed. Richard Crangle (Exeter: University of Exeter Press, 2000).
7. Sean Cubitt, *The Cinema Effect* (Cambridge, MA: The MIT Press, 2004), 70-84.
8. The entry "Automate" in Jean le Rond d'Alembert and Denis Diderot, eds., *Encyclopédie; ou Dictionnaire raisonné des sciences, des arts et des métiers*, vol. 1 (Paris, 1751), 897; English transl. by Nelly S. Hoyt and Thomas Cassirer in *The Encyclopedia of Diderot & d'Alembert: Collaborative translation project*, http://www.hti.umich.edu/cgi/t/text/text-idx?c=did;cc=did;rgn=main;view=text;idno=did2222.0000.140 (accessed September 30, 2008).
9. See André Doyon and Lucien Liaigre, *Jacques Vaucanson: Mécanicien de genie* (Paris: Presses Universitaires de France, 1966), 49-64.
10. E. T. A. Hoffmann, "The Sandman," transl. R. J. Hollingdale, in *Tales of Hoffmann* (London: Penguin Books, 2004), 115-16.
11. Gordon, *Why the French Love Jerry Lewis*, 176-95.
12. Jean-Martin Charcot, *Leçons du mardi à la Salpêtrière: Policlinique 1888-1889* (Paris: Progrès Médical / Lecrosnier et Babé, 1889), 356-57 (my translation). Hereafter all translations of quotations from non-English sources are mine unless otherwise noted in the reference.
13. Hoffmann, "The Sandman," 121.
14. Jules Séglas, *Des troubles du langage chez les aliénés* (Paris: J. Rueff et Cie, 1892), 292-93.
15. Rainer Maria Rilke, *The Notebooks of Malte Laurids Brigge*, transl. M.D. Herter Norton (New York: W.W. Norton & Company, 1964), 63-64.
16. On *Pathosformeln*, see Aby Warburg, "Dürer and Italian Antiquity," in *The Renewal of Pagan Antiquity*, transl. David Britt (Los Angeles: The Getty Research Institute for the History of Art and the Humanities, 1999), 553-58; Georges Didi-Huberman, *L'image survivante: Histoire de l'art et temps des fantômes selon Aby Warburg* (Paris: Les Éditions de Minuit, 2002), 191-202, 284-85. On the relationship between Warburg's "pathos formula" and neuro-psychiatric discourses circa 1900, especially Charcot, see Sigrid Schade, "Charcot and the Spectacle of the Hysterical Body: The 'Pathos Formula' as an Aesthetic Staging of Psychiatric Discourse – a Blind Spot in the Reception of Warburg," *Art History* 18:4 (1995): 499-517.
17. Agamben, "Notes on Gesture," in *Means without End*, 52.

18. Ibid., 59.
19. Deleuze, *Cinema 1*, 7; 16.
20. Élie Faure, *Fonction du cinéma: De la cinéplastique à son destin social* (Paris: Denoël / Gonthier, 1976), 13.
21. Jean Epstein, "Le sens 1 bis," in *Écrits sur le cinéma*, vol. 1, 1921-1947 (Paris: Cinéma Club / Seghers, 1974), 92.
22. See Agamben, "Notes on Gesture," 55.
23. Méliès's films that portray these features either separately or conjointly include: *Un homme de têtes* (1898), *Dédoublement fantastique* (1898), *Le chevalier mystère* (1899), *Le portrait mystérieux* (1899), *L'Illusioniste double* (1900), *L'Homme orchestre* (1900), *Le chimiste repopulateur* (1901), *Dislocation mystèrieuse* (1901), *Equilibre impossible* (1902), *L'Homme à la tête de caoutchouc* (1902), *Une indigestation* (1902), *Le cake-walk infernale* (1903), *Le mélomane* (1903), *Un peu de feu, s.v.p.* (1903), *La lanterne magique* (1903), *Une bonne farce avec ma tête* (1904), *La photographie électrique à distance* (1908). More generally on the theme of decapitation in Méliès, see Thierry Lefevbre, "Retour à un cinéma cérébral," *1895*, no. 27 (1999): 33-46; Jacques Malthête, "Quand Méliès n'en faisait qu'à sa tête," *1895*, no. 27 (1999): 21-32. On the magic show background of Méliès in particular and early cinema in general, see e.g. Dan North, "Magic and Illusion in Early Cinema," *Studies in French Cinema* 1:2 (2000): 70-79.
24. Tom Gunning brings up this point in arguing that what he terms the cinema of attractions has one basic temporality, that of the alternation between absence and presence. In aspiring toward visual display and presentation, the early cinema converts jagged rhythms of "presentification" into its stylistic element. Instead of a development that links the past with the present in order to produce an anticipation of the future as in an unfolding narrative, the attraction is limited to the present tense of its appearance. The transformation acts in Méliès's work can be seen as these kinds of attractions. As for the gesture that announces and directs attention to the act, Gunning suggests that it creates a temporal framework of suspense and expectation. In this respect, according to Gunning, Méliès plays a representative of the early cinema at large: "Méliès's transformations become emblematic examples of the cinema of attractions, endlessly replaying the effect of surprise and appearance, as would a series of brief actualities of the Lumière sort, appearing one after another." Tom Gunning, "'Now You See It, Now You Don't': The Temporality of the Cinema of Attractions," in *Silent Film*, ed. Richard Abel (New Brunswick, NJ: Rutgers University Press, 1996), 78.
25. On Nietzsche's conception of the body, see Gilles Deleuze, *Nietzsche and Philosophy*, transl. Hugh Tomlinson (London: Continuum, 2006), 36-37; original in *Nietzsche et la philosophie* (Paris: Presses Universitaires de France, 1994), 44-45 (henceforth French pagination will be given following English). According to Deleuze, the Nietzschean body is defined as consisting of relations of forces (be they chemical, biological, social, or political, for example), not as a site or a field of forces but as a product of their interactions. More generally on the body as conceived in terms of forces and surfaces in Western thought, see Elizabeth Grosz, *Volatile Bodies: Toward a Corporeal Feminism* (Bloomington: Indiana University Press, 1994), 115-83.
26. See Marc Jeannerod, *The Brain Machine: The Development of Neurophysiological Thought*, transl. David Urion (Cambridge, MA: Harvard University Press, 1985), 19.

27. Michel Foucault, *Les mots et les choses: Une archéologie des sciences humaines* (Paris: Gallimard, 1966), 281-91.
28. Jeannerod, *The Brain Machine*, 79.
29. Claude Bernard, *Introduction à l'étude de la médecine expérimental* (Paris: J.B. Baillière et Fils, 1865), 29.
30. Merriley Borell, "Instrumentation and the Rise of Modern Physiology," *Science & Technology Studies* 5 (Summer 1987): 53-56; Soraya de Chadarevian, "Graphical Method and Discipline: Self-Recording Instruments in Nineteenth-Century Physiology," *Studies in History and Philosophy of Science* 24 (1993): 279-86; Sven Dierig, "Engines for Experiment: Laboratory Revolution and Industrial Labor in the Nineteenth-Century City," *Osiris* 18 (2003): 116-8.
31. Emil du Bois-Raymond, "Der physiologische Unterricht sonst und jetzt," in *Reden von Emil du Bois-Raymond*, vol. 1 (Leipzig: Veit & Co., 1912), 645, quoted in Dierig, "Engines for Experiment," 118.
32. Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (Cambridge, MA: The MIT Press, 1990), 97-116.
33. Ibid., 79.
34. For the treatment that follows, see especially Helmholtz's essay "The Facts in Perception," *Science and Culture: Popular and Philosophical Essays*, ed. David Cahan (Chicago: The University of Chicago Press, 1995), 342-80. See also Jonathan Crary, *Suspensions of Perception: Attention, Spectacle, and Modern Culture* (Cambridge, MA: The MIT Press, 1999), 319-22; Patrick J. McDonald "Demonstration by Simulation: The Philosophical Significance of Experiment in Helmholtz's Theory of Perception," *Perspectives on Science* 11 (2003): 176-91; Timothy Lenoir, "The Eye as Mathematician: Clinical Practice, Instrumentation, and Helmholtz's Construction of an Empiricist Theory of Vision," in *Hermann von Helmholtz and the Foundations of Nineteenth-Century Science*, ed. David Cahan (Berkeley: University of California Press, 1993), 109-53.
35. Tom Gunning, "An Unseen Energy Swallows Space: The Space in Early Film and Its Relation to American Avant-Garde Film," in *Film Before Griffith*, ed. John L. Fell (Berkeley: University of California Press, 1983), 358.
36. Ibid., 359.
37. Cf. Crary, *Techniques of the Observer*, 125.
38. Lenoir, "The Eye as Mathematician," 124. See also McDonald, "Demonstration by Simulation," 189.
39. McDonald, "Demonstration by Simulation," 191-202.
40. Jessica Riskin, "Eighteenth-Century Wetware," *Representations* 83 (Summer 2003): 101, 120n9.
41. For example, Jean Baudrillard's influential characterization of "postmodern" commodity societies as ones of simulacra follows, to some extent, the negative logic of representation, especially in terms of lack. For Baudrillard, "[s]imulation 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." Jean Baudrillard, "Simulacra and Simulations," in *Selected Writings*, ed. Mark Poster (Stanford: Stanford University Press, 1988), 166.

42. See Gilles Deleuze, *The Logic of Sense*, transl. Mark Lester with Charles Stivale (London: Continuum, 2004), 296; original in *Logique du sens* (Paris: Les Éditions de Minuit, 1969), 298 (henceforth, French pagination will be listed after the English).
43. Jessica Riskin, "The Defecating Duck, or, the Ambiguous Origins of Artificial Life," *Critical Inquiry* 29 (Summer 2003): 599-633; Riskin, "Eighteenth-Century Wetware," 97-125.
44. Riskin, "The Defecating Duck," 604.
45. Riskin, "Eighteenth-Century Wetware," 98.
46. See Mannoni, *The Great Art of Light and Shadow*, 275-76. One must also note that all kinds of mechanical automata were very popular and widely distributed in the nineteenth century.
47. Riskin, "The Defecating Duck," 601.
48. See, e.g., Marta Braun, *Picturing Time: The Work of Étienne-Jules Marey (1830-1904)* (Chicago: University of Chicago Press, 1994), 150-98, 228-62. The ambiguousness points here to Marey's reluctance to seek commercial applications of his inventions.
49. See Thomas L. Hankins and Robert J. Silverman, *Instruments and the Imagination* (Princeton, NJ: Princeton University Press, 1995), 185; Riskin, "Eighteenth-Century Wetware," 125n56. On simulacra of insect flight, see e.g. Étienne-Jules Marey, *Animal Mechanism: A Treatise on Terrestrial and Aerial Locomotion*, 2nd ed. (London: Henry S. King & Co., 1874), 196-208; original in *La machine animale: Locomotion terrestre et aérienne* (Paris: Librairie Germer Baillière, 1873), 204-17 (henceforth, French pagination will be listed after the English). However, the concept of movement had changed drastically over the one hundred years that separated Vaucanson and Marey. Vaucanson's automata belong to the Newtonian universe with reversible mechanics and disparate sources of action, whereas Marey's ideas were influenced by thermodynamics that revealed irreversible phenomena and energy chains. See Rabinbach, *The Human Motor*, 51-52.
50. Étienne-Jules Marey, "La Station physiologique de Paris," *La nature*, no. 536 (1883): 267.
51. Quoted in Braun, *Picturing Time*, 15.
52. Étienne-Jules Marey, *La méthode graphique dans les sciences expérimentales et particulièrement en physiologie et en médicine* (Paris: G. Masson, 1878), iii-iv.
53. See Étienne-Jules Marey, "Reproduction mécanique du vol des insectes," *Comptes rendus hebdomodaires des séances de l'Académie des Sciences* 68 (1869): 668.
54. Marey, *Animal Mechanism*, 137; 143. See also Étienne-Jules Marey, *Movement*, transl. Eric Pritchard (London: William Heinemann, 1895), 304-18; original in *Le mouvement* (Paris: G. Masson, 1894), 297-310 (henceforth, French pagination will be listed after the English).
55. Peter M. Harman, *Energy, Force, and Matter: The Conceptual Development of Nineteenth-Century Physics* (Cambridge: Cambridge University Press, 1982), 9.
56. Braun, *Picturing Time*, 22.
57. With respect to Marey, Crary appropriately characterizes Paul Cézanne's late work as an attempt to make transform the eye into a new kind of organ. During the last years of his life, Cézanne discussed how he wanted to be a "recording machine," or a "sensitized plate" that "translates automatically" the impressions of reality. According to Crary, Cézanne sought "to become an apparatus that could implacably

apprehend a world outside of the terms of figure/ground, center/periphery, or close/distant." Crary, *Suspensions of Perception*, 341-42.

58. Marey, *La méthode graphique*, viii.
59. Friedrich Kittler, "Mas as a Drunken Town-musician," transl. Jocelyn Holland, *MLN* 118 (April 2003): 648.
60. In this way, the self-recording machine becomes a nonsubjective observer that, as Deleuze and Guattari describe it, "is precisely the sensory that qualifies... a scientifically determined state of affairs, thing, or body." Deleuze and Guattari, *What is Philosophy?*, 131; 125.
61. Jean Epstein, "Le cinématographe vu de l'Etna," in *Écrits sur le cinéma*, vol. 1, 136-37.
62. See Paul Virilio, *War and Cinema: The Logistics of Perception*, transl. Patrick Camiller (London: Verso, 1989); Deleuze, *Cinema 1*, 81-83; 117-20.
63. Georges Méliès, "Cinematographic Views," transl. Stuart Liebman, in *French Film Theory and Criticism: A History / Anthology*, vol. 1, 1907-1929, ed. Richard Abel (Princeton, NJ: Princeton University Press, 1988), 35-47, quotation on 44.
64. Cf. Martin Jay, "Experience Without a Subject: Walter Benjamin and the Novel," in *Rediscovering History: Culture, Politics, and the Psyche*, ed. Michael S. Roth (Stanford: Stanford University Press, 1994), 121-33. Jay connects Walter Benjamin's theories regarding *Erfahrung* or, experience without a subject, with Ann Banfield's analysis of modern recording instruments, e.g., the camera, the thermometer and the tape recorder, in which "non-sensed sensibilia can manifest themselves without an actual subject present when the event occurs."
65. Lorraine Daston and Peter Galison, "The Image of Objectivity," *Representations* 40 (Autumn 1992): 98.
66. Samuel Butler, in 1872, had already summarized this: "In fact, wherever precision is required man flies to the machine at once, as far preferable to himself. Our sum-engines never drop a figure, nor our looms a stitch; the machine is brisk and active when the man is weary; it is clear-headed and collected, when man must sleep or drop..." Samuel Butler, *Erewhon*, ed. Peter Mudford (London: Penguin Books, 1985), 205.
67. Marey, *La méthode graphique*, 108.
68. Monique Sicard, *L'Année 1895: L'Image écartelée entre voir et savoir* (Paris: Les Empêcheurs de Penser en Rond, 1994).
69. On the epistemological qualities attributed to photography during the late nineteenth century as well as on the formation of new (social) bodies within those assemblages, see, e.g., Allan Sekula, "The Body and the Archive," *October* 39 (Winter 1986): 3-64.
70. Deleuze, *Cinema 1*, 3-8; 12-15.
71. Ibid., 24; 39. For the difference between the mould and modulation, see also Gilbert Simondon, *L'Individu et sa genèse physico-biologique* (Paris: Presses Universitaires de France, 1964), 41-42.
72. See Isabelle Stengers, *The Invention of Modern Science*, transl. Daniel W. Smith (Minneapolis: University of Minnesota Press, 2000), 144-45. The argument that facts are constructed is not meant to support the social constructivist thesis that "matters of fact" are always fabricated in human interrelations. On the contrary, what it wants to point out is that reality is not a timeless and passive reservoir but active and self-

transforming. Secondly, the notion supports a quasi-autonomous life of mediators between nature and culture.

73. Friedrich Kittler, *Discourse Networks 1800/1900*, transl. Michael Metteer with Chris Cullens (Stanford: Stanford University Press, 1990), 265-73.
74. Ibid., 265. Moreover, Kittler argues, "Interpretation is only a special instance of the general technique of transposing media. There is no psychological bridge between the encoding author and the decoding interpreter, but a technical contest." (ibid., 270).
75. Immanuel Kant, *The Critique of the Power of Judgment*, ed. Paul Guyer, transl. Paul Guyer and Eric Matthews (Cambridge: Cambridge University Press, 2000), 180 (§42).
76. Agamben, "Notes on Gesture," 58.
77. Kittler, *Gramophone, Film, Typewriter*, 37.
78. Gilles Deleuze, *Expressionism in Philosophy: Spinoza*, transl. Martin Joughin (New York: Zone, 1992), 172; original in *Spinoza et le problème de l'expression* (Paris: Les Éditions de Minuit, 1968), 156 (henceforth, French pagination will be listed after the English).
79. Étienne-Jules Marey, "Emploi des photographies partielles pour étudier la locomotion de l'homme et des animaux," *Comptes rendus hebdomodaires des séances de l'Académie des sciences* 96 (1883): 1830. See also Étienne-Jules Marey, "La photographie du mouvement," *La nature*, no. 477 (1882): 116.
80. Wilhelm Braune and Otto Fischer, *The Human Gait*, transl. P. Maquet and R. Furlong (Berlin: Springer-Verlag, 1987), 1.
81. Kittler, "Man as a Drunken Town-musician," 642-649.
82. Marey, *Animal Mechanism*, 4-45; 40-44. See also Marey, *La méthode graphique*, 148; Doane, *The Emergence of Cinematic Time*, 47. On the background of Helmholtz's experimental research on the time of the nervous apparatus, see, e.g., Fredrick L. Holmes and Kathryn M. Olesko, "Experiment, Quantification, and Discovery: Helmholtz's Early Physiological Researches, 1843-50," in *Hermann von Helmholtz and the Foundations of Nineteenth-Century*, 83-95.
83. Marey, *La méthode graphique*, 167.
84. See Doane, *The Emergence of Cinematic Time*, 48-49. As for the notion of light that comes up in this context, Gaston Bachelard traces how a gradual development in photochemistry beginning in the nineteenth century generated within which matter became seen as amenable to transformations caused by light instead of as immutable, rigid substance. Matter stood to lose its permanence and became temporal, as Bachelard concluded that "[o]ne should not explain light through matter. One should explain matter through light, substance through vibration." Gaston Bachelard, "Lumière et substance," *Revue de métaphysique et de morale* 41:3 (1934): 343-66, quotation in 366. Photography, Bachelard noted, already bore the germ of this kind of perception. But it lacks immanent temporal dynamics, duration, when considering moving bodies. As Marey's studies show, it is in chronophotography and consequently in cinema that matter becomes identified with light in the same way as the animate body becomes identified with the moving image. Bodies become processual variations on the image surface.
85. See Marey, *Movement*, 60-61; 60-61.
86. Braun, *Picturing Time*, 81.

87. Ibid., 66.
88. See Elsaesser, "Kontingenz und Handlungsmacht im zeitgenössischen Kino," 184-87.

Chapter 2

1. See Sheets-Johnstone, *The Primacy of Movement*, 223-71; Daniel N. Stern, *The Interpersonal World of the Infant: A View from Psychoanalysis and Developmental Psychology* (New York: Basic Books, 2000), 53-56; Daniel N. Stern, *The Present Moment in Psychotherapy and Everyday Life* (New York: W.W. Norton & Co., 2004), 62-70.
2. Deleuze, *Cinema 1*, 56; 83.
3. This point is stressed by Crary: "For the first time subjectivity is made quantifiably determinable. This is Fechner's 'Galilean' achievement – making measurable something that had not been so before." Crary, *Techniques of the Observer*, 145.
4. Gustav Fechner, *Elements of Psychophysics*, vol. 1, transl. Helmut E. Adler (New York: Holt, Rinehart and Winston, Inc., 1966), 7.
5. Ibid., 60-64. See also Edwin G. Boring, *A History of Experimental Psychology* (Englewood Cliffs, NJ: Prentice-Hall, Inc., 1950), 284-96.
6. With respect to Fechner, Crary argues: "Once the empirical truth of vision was determined to lie in the body, the senses – and vision in particular – were able to be annexed and controlled by external techniques of manipulation and stimulation. This was the epochal achievement of the science of psychophysics in the mid-nineteenth century – above all the work of the scientist-philosopher Gustav Fechner – which rendered sensation measurable and embedded human perception in the domain of the quantifiable and the abstract.… The second half of the nineteenth century was a critical historical threshold, during which any significant qualitative difference between a *biosphere* and a *mechanosphere* began to evaporate." Jonathan Crary, "Unbinding Vision: Manet and the Attentive Observer in the Late Nineteenth Century," in *Cinema and the Invention of Modern Life*, eds. Leo Charney and Vanessa R. Schwartz (Berkeley: University of California Press, 1995), 47. On the rationalization and discipline of perception in psychophysics, see also Crary, *Techniques of the Observer*, 147-48.
7. Fechner, *Elements of Psychophysics*, 205-7.
8. Crary, *Suspensions of Perception*, 26.
9. Alfred Binet, *Introduction à la psychologie expérimentale* (Paris: Félix Alcan, 1894), 2-5.
10. Wilhelm Wundt, *Eléments de la psychologie physiologique*, vol. 2, transl. Élie Rouvier (Paris: Félix Alcan, 1886), 247-328. On the background of Wundt's reaction time experiments, see Henning Schmidgen, "Time and Noise: The Stable Surroundings of Reaction Experiments, 1860-1890," *Studies in History and Philosophy of Biological and Biomedical Sciences* 34 (2003): 237-75.
11. Théodule Ribot, "De la durée des actes psychiques d'après les travaux récents." *Revue philosophique* 1 (1876): 288.
12. Crary, *Suspensions of Perception*, 294.
13. Binet, *Introduction à la psychologie expérimentale*, 28-29.

14. Didier Deleule, "The Living Machine: Psychology as Organology," transl. Randall Cherry, in *Incorporations*, eds. Jonathan Crary and Sanford Kwinter (New York: Zone, 1992), 210.
15. See Kurt Danziger, *Constructing the Subject: Historical Origins of Psychological Research* (Cambridge: Cambridge University Press, 1990), 141-55.
16. See Hermann Ebbinghaus, *Memory: A Contribution to Experimental Psychology,* transl. Henry A. Ruger and Clara E. Bussenius (New York: Dover, 1964).
17. James McKeen Cattell, "Mental Measurement," *The Philosophical Review* 2 (May 1893): 326. On Cattell, see Boring, *A History of Experimental Psychology,* 536-40.
18. See Crary, *Suspensions of Perception*, 302-7.
19. Kittler, *Discourse Networks 1800/1900*, 223.
20. Ibid., 251.
21. On the importance of Bergson in the reconfiguration of visuality in modernity, see, e.g., Martin Jay, *Downcast Eyes: The Denigration of Vision in Twentieth-Century French Thought* (Berkeley: University of California Press, 1994), 191-208.
22. Henri Bergson, *Time and Free Will: An Essay on the Immediate Data of Consciousness*, transl. F.L. Pogson (Mineola, NY: Dover, 2001), 168; original in *Essai sur les données immédiates de la conscience*, in *Œuvres*, 111 (henceforth, French pagination will be listed after the English).
23. Henri Bergson, *Creative Evolution*, transl. Arthur Mitchell (New York: Henry Holt & Co., 1911), 306; original in *L'Évolution créatrice*, in *Œuvres*, 753 (henceforth, French pagination will be listed after the English).
24. Benjamin, "On Some Motifs in Baudelaire," in *Illuminations*, 171. On the affinities between Bergson's and Benjamin's understanding of the cinema, see Dominique Chateau, *Cinéma et philosophie* (Paris: Nathan, 2003), 48-49.
25. Miriam Bratu Hansen, "Benjamin and Cinema: Not a One-Way Street," *Critical Inquiry* 25:2 (1999): 306-343, see especially 317.
26. Deleuze, *Cinema 1*, 56; 83.
27. On the ontology of movement in the cinema, see Deleuze, *Cinema 1*, 3-11; 9-22.
28. Maxim Gorky, "A Review of the Lumière programme at the Nizhni-Novgorod Fair," transl. Leda Swan, in Jay Leyda, *Kino: A History of the Russian and Soviet Film* (London: George Allen & Unwin, 1983), 408.
29. Lynda Nead, "Velocities of the Image c. 1900," *Art History* 27:5 (2004): 757-59.
30. Deleuze, *Cinema 2*, 37; 54.
31. Henri Bergson, *Matter and Memory,* transl. Nancy Margaret Paul and W. Scott Palmer (New York: Zone Books, 1988), 25; original in *Matière et mémoire: Essai sur la rélation du corps à l'esprit*, in *Œuvres*, ed. André Robinet, 6th ed. (Paris: Presses Universitaires de France, 2001), 176 (henceforth, French pagination will be listed after the English).
32. On Wundt, see Crary, *Suspensions of Perception*, 291-95.
33. Bergson, *Matter and Memory,* 64; 212.
34. Gilbert Simondon, *Du mode d'existence des objets techniques* (Paris: Éditions Aubier, 1989), 115-19.
35. Casetti, *Eye of the Century,* 144.
36. See Deleuze, *Cinema 1*, 66; 96.
37. The technique is illustrated in Paul Hammond, *Marvellous Méliès* (New York: St. Martin's Press, 1975), 100

38. See Giorgio Agamben, *The Open: Man and Animal*, transl. Kevin Attell (Stanford: Stanford University Press, 2004), 13.
39. Aristotle, *On the Soul*, in *On the Soul, Parva Naturalia, On Breath*, transl. W.S. Hett (Cambridge, MA: Harvard University Press, 2000), 413a22-413b2.
40. Agamben, *The Open*, 14.
41. Xavier Bichat, *Physiological Researches on Life and Death*, transl. F. Gold, in *Physiological Psychology*, vol. 2 of *Significant Contributions to the History of Psychology 1750-1920*, series E, ed. Daniel N. Robinson (Washington: University Publications of America, 1978), 10-11.
42. Ibid., 13-14.
43. Agamben, *The Open*, 14-15. On the development of the modern distinction between the animal and organic functions, see, e.g., Michel Foucault, *Naissance de la clinique*, 6th ed. (Paris: Presses Universitaires de France, 2000), 125-49.
44. Agamben, *The Open*, 15.
45. Diderot and d'Alembert had already implied this in their description of the duck: "A duck in which he [Vaucanson] shows the viscera destined for the functions of drinking, eating, digesting. The interplay of all the parts necessary for these actions is imitated faithfully. The duck stretches its neck to take grain from the hand, it swallows, digests, and excretes in the normal way. All the movements of the duck, which swallows quickly and increases the speed of the movement of its gullet in order to pass the food down to the stomach, are copied from nature. The nutriment is digested as happens with real animals, by means of dissolution and not by trituration. The matter digested in the stomach is conveyed through tubes similar to the bowels of the real animal, to the anus where a sphincter permits the excretion." D'Alembert and Diderot, eds., *Éncyclopédie*, vol. 1, 896; English translation by Nelly S. Hoyt and Thomas Cassirer in *The Encyclopedia of Diderot & d'Alembert: Collaborative translation project*, http://www.hti.umich.edu/cgi/t/text/text-idx?c=did;cc=did;rgn=main;view=text;idno=did2222.0000.140 (accessed November 30, 2008).
46. Bichat, *Physiological Researches on Life and Death*, 11.
47. Crary, *Techniques of the Observer*, 67-82; Crary, *Suspensions of Perception*, 310-11.
48. Michel Foucault, *The Will to Knowledge*, vol. 1 of *History of Sexuality*, transl. Robert Hurley (London: Penguin Books, 1998), 141-42. See also Michel Foucault, *Naissance de la biopolitique: Cours au Collège de France, 1978-1979* (Paris: Seuil/Gallimard, 2004); *Society Must Be Defended: Lectures at the Collège de France, 1975-1976*, transl. David Macey (London: Penguin Books, 2003), especially 239-64. For a recent rearticulation of the concepts of biopower and biopolitics, augmenting and also challenging Foucault, see Roberto Esposito, *Bíos: Biopolitics and Philosophy*, transl. Timothy Campbell (Minneapolis: University of Minnesota Press, 2008).
49. Martin Heidegger, *Unterwegs zur Sprache* (Stuttgart: Klett-Cotta, 2003), 215.
50. Foucault, *The Will to Knowledge*, 142-43.
51. Ibid., 137. Foucault finds the origins of modern biopower in Christian pastoral power, which is based on taking care of the life and movements of population. See Foucault, "'*Omnes et singulatim*': Toward a Critique of Political Reason," in *Essential Works of Foucault*, vol. 3, *Power*, ed. James D. Faubion, transl. Robert Hurley et al. (London: Penguin Books, 2002), 298-325. See also Mika Ojakangas, "Impossible Dialogue on Bio-power: Agamben and Foucault," *Foucault Studies* 2 (2005): 5-28. http://

ej.lib.cbs.dk/index.php/foucault-studies/article/view/856/874 (accessed March 20, 2009)

52. See, e.g., Rabinbach, *The Human Motor*, 115-19.
53. Foucault, *The Will to Knowledge*, 143. Michael Hardt and Antonio Negri propose that in the present situation the realm of communication and the media in general should be seen as coexistent with the biopolitical context. That is because the former not only produces commodities but, more fundamentally, it also creates and orders subjectivities and integrates them into the functions of the "imperial machine." In other words, communication is immanent to productive and social relations, the social *bios*. See Michael Hardt and Antonio Negri, *Empire* (Cambridge, MA: Harvard University Press, 2000), 32-34. However, from the viewpoint presented here, Hardt and Negri in their concept of social *bios* fail to address how technological media also integrate the natural *zoē* into the biopolitical realm.
54. Agamben, *Homo Sacer*, 9.
55. Ibid., 186.
56. Giorgio Agamben, "Absolute Immanence," in *Potentialities*, 230. On affectivity and contemporary power, see Brian Massumi, *Parables for the Virtual: Movement, Affect, Sensation* (Durham, NC: Duke University Press, 2002), 39-42.
57. Faure, *Fonction du cinéma*, 56.
58. See Pierre-Henri Castel, *La querelle de l'hystérie*: *La formation du discours psychopathologique en France (1881-1913)* (Paris: Presses Universitaires de France, 1998).
59. For an historical overview of the different conflicting conceptions of hysteria in the nineteenth and early twentieth centuries, see Nicole Edelman, *Les métamorphoses de l'hystérique: Du début du XIXe siècle à la Grande Guerre* (Paris: Éditions La Découverte, 2003).
60. Georges Didi-Huberman, *Invention de l'hystérie: Charcot et l'Iconographie photographique de la Salpêtrière* (Paris: Macula, 1982), 79.
61. As for an emblematic description of the notion of *sine materia*, Charcot says: "Most certainly there is no organic disease of the hip-joint in this patient, that is well-established. He is the subject of an hysterical coxalgia *sine materia*, as you may call it." Jean-Martin Charcot, *Clinical Lectures on Diseases of the Nervous System*, vol. 3, transl. Thomas Savill (London: New Sydenham Society, 1889), 329; original in *Leçons sur les maladies du système nerveux*, vol. 3 (Paris: Progrès Médicale / Delahaye & Lecrosnie, 1887), 384 (henceforth, French pagination will be listed after the English).
62. Henri Meige, *Charcot – Artiste* (Paris: Masson, 1925), 13-15, quoted in Daphne de Marneffe, "Looking and Listening: The Construction of Clinical Knowledge in Charcot and Freud," *Signs: Journal of Women in Culture and Society* 17 (Autumn 1991): 77.
63. Quoted in Ulrich Baer, "Photography and Hysteria: Toward a Poetics of the Flash," *The Yale Journal of Criticism* 7 (Spring 1994): 48. See also Kittler, *Discourse Networks 1800/1900*, 221-22; de Marneffe, "Looking and Listening," 74-76.
64. Sigmund Freud, "Charcot," in *The Standard Edition of the Complete Psychological Works of Sigmund Freud*, transl. and ed. James Strachey in collaboration with Anna Freud, 24 vols. (London: Vintage, 2001), 3:12 (henceforth, *The Standard Edition* is abbreviated as *SE*). Crucially, Charcot himself dreamed of being a kind of sensitive plate: "[B]ut in truth, I am absolutely nothing but a photographer; I inscribe what I

see." Charcot, *L'Hystérie: Textes choisis*, quoted in Baer, "Photography in Hysteria," 48.

65. Paul Richer, *Études cliniques sur la grande hystérie ou hystéro-epilépsie* (Paris: Delahaye & Lecrosnier, 1885), plate V.
66. Ibid., 90, 97.
67. Castel, *La querelle de l'hystérie*, 39.
68. Didi-Huberman, *Invention de l'hystérie*, 175-79.
69. Quoted in Crary, *Suspensions of Perception*, 70.
70. Charcot, *Clinical Lectures*, 289 (translation modified); 336.
71. See, e.g., Edgar Bérillon, "Considérations générales sur l'hypnotisme," *Revue de l'hypnotisme experimental et thérapeutique* 1 (1887): 2-4.
72. Pierre Janet, "J.-M. Charcot: Son œuvre psychologique," *Revue philosophique* 39 (1895): 596. On hypnosis as an experimental procedure, see also Henri Beaunis, "L'Expérimentation en psychologie par le somnambulisme provoqué," *Revue philosophique* 20 (1885): 1-36, 113-35.
73. Charcot, *Clinical Lectures*, 304-5; 355-56 (emphasis in original). Significantly, Charcot's simulation of hysterical paralyses with hypnosis contributed to showing Freud the pathway to the "royal road" to the unconscious. In a necrology written after Charcot's death in 1893, Freud wrote: "At one point in his work, Charcot rose to a level higher even than that of his usual treatment of hysteria. The step he took assured him for all time, too, the fame of having been the first to explain hysteria. While he was engaged in the study of hysterical paralyses arising after traumas, he had the idea of artificially reproducing those paralyses, which he had earlier differentiated with care from organic ones. For this purpose he made use of hysterical patients whom he put into a state of somnambulism by hypnotizing them. He succeeded in proving, by an unbroken chain of argument, that these paralyses were the result of ideas which had dominated the patient's brain at moments of a special disposition." Freud, "Charcot," 22. On Charcot and Freud, see e.g. Henri F. Ellenberger, *The Discovery of the Unconscious: The History and Evolution of Dynamic Psychiatry* (New York: Basic Books, 1970), 480-89. On Freud's epistemology and its relation to the moving image, see the chapter four below.
74. Cf. Didi-Huberman, *Invention de l'hystérie*, 182-84.
75. Charcot, *Clinical Lectures*, 14-19; 17-22.
76. Ibid., 289; 335.
77. Ibid., 13-14; 16-17. See also Katrien Libbrecht, *Les délires de l'hystérique: Une approche historique*, transl. Danièle Faugeras (Ramonville Saint-Agne: Érès, 2001), 69-70.
78. Richer, *Études cliniques*, 111.
79. Pierre Janet, *L'Automatisme psychologique: Essai de psychologie expérimentale sur les formes inférieures de l'activité humaine*, 10th ed. (Paris: Félix Alcan, 1930), 18. On the other hand, philosopher Jean-Marie Guyau compares the brain to a "conscious phonograph." Jean-Marie Guyau, *Genèse de l'idée de temps* (Paris: Félix Alcan, 1890), 56.
80. Charcot, *Clinical Lectures*, 290; 337.
81. Ibid., 335; 392.
82. Albert Londe, *La photographie médicale: Application aux sciences médicales et physiologiques* (Paris: Gauthier-Villars et fils, 1893), 3-4.
83. Baer, "Photography and Hysteria," 44-45, 49-60.
84. Ibid., 69.

85. Gordon, *Why the French Love Jerry Lewis*, 127-66.
86. Ibid., 174.
87. Friedrich Nietzsche, *Nachgelassene Fragmente 1887-1889*, in *Sämtliche Werke: Kritische Studienausgabe*, eds. Giorgio Colli and Mazzino Montinari, 15 vols. (Munich: Deutsche Taschenbuch Verlag; Berlin: de Gruyter, 1999), 13:14[119] (297); see also, e.g., 14[120] (299), 14[18] (226). *Kritische Studienausgabe* is hereafter abbreviated as *KSA* and *Nachgelassene Fragmente* as *Nachlass*.
88. Ibid., 17[9] (530).
89. Charles Féré, *Sensation et mouvement: Études expérimentales de psycho-mécanique* (Paris: Félix Alcan, 1887), 15.
90. Crary, *Suspensions of Perception*, 167.
91. Nietzsche, *Nachlass 1887-1889*, 15[10] (410), 16[40] (499).
92. Rilke, *The Notebooks of Malte Laurids Brigge*, 58. On the inscription of the functioning of speech organs as well as the sounds produced, see Étienne-Jules Marey, "L'Inscription des phénomènes phonétiques. Première partie: méthodes directes," *Revue générale des sciences pures et appliquées* 9 (1898): 443-56.
93. Kittler argues that "only silent films command the robbing of the narrative I of all its organs of speech. In lieu of reflexive introspections we have neurologically pure data flows that are always already films on the retina." Kittler, *Gramophone, Film, Typewriter*, 166.
94. Georges Demeny, "Les photocopies parlantes," *La nature*, no. 985 (1892): 314.
95. Giuliana Bruno, *Public Intimacy: Architecture and the Visual Arts* (Cambridge, MA: The MIT Press, 2007), 107.
96. Mario Dall'Olio, "La neuropatologia al cinematografo," in *La Gazetta di Torino*, February 18, 1908, quoted in Bruno, *Public Intimacy*, 114.
97. See Georges Marinesco, "Les applications générales du cinématographe aux sciences biologiques et à l'art," *Revue générale des Sciences pures et appliquées* 11 (1900): 117. The activity of neurological cinematography began in Germany as early as 1897, and a year later in France. Londe bought a movie camera and filmed about 10 short films of neurological patients with his colleague Paul Richer. In Belgium, the neurologist Arthur van Gehuchten began producing thousands of neurological motion pictures in 1905; the films were especially made for educational purposes and used to demonstrate neurologic semiology, for example. Also in 1905, in the United States, Walter Chase filmed the "epilepsy biographs," consisting of 21 films of epileptic seizures. See Geneviève Aubert, "Arthur Van Gehuchten takes neurology to the movies," *Neurology* 59 (November 2002): 1616; Cartwright, *Screening the Body*, 56-71.
98. Libbrecht, *Les délires de l'hystérique*, 36-38.
99. Charcot, *Clinical Lectures*, 370-71; 435.
100. Ibid., 372; 437.
101. See Michel Foucault, "The Subject and Power," in *Essential Works of Foucault 1954-1984*, vol. 3, *Power*, 340-41.
102. Foucault, "'Omnes et signulatim'," 324.
103. Giorgio Agamben, "Kommerell, or On Gesture," in *Potentialities*, 78.
104. Heidegger, "The Question Concerning Technology," 322-23.

Chapter 3

1. Doane, *The Emergence of Cinematic Time*, 116.
2. Harbord, *The Evolution of Film*, 146.
3. Ernst Kapp, *Grundlinien einer Philosophie der Technik: Zur Entstehungsgeschichte der Cultur aus neuen Gesichtspunkten* (Braunschweig: George Westermann, 1877), 27-39.
4. Ibid., 40-41.
5. See ibid., 60.
6. See Friedrich Kittler, *Eine Kulturgesichte der Kulturwissenschaft*, 2nd ed. (Munich: Wilhelm Fink Verlag, 2000), 206.
7. See, e.g., Anna Bramwell, *Ecology in the 20th Century: A History* (New Haven: Yale University Press, 1989), 39-45.
8. Gilles Deleuze, *Spinoza: Practical Philosophy*, transl. Robert Hurley (San Francisco: City Lights Books, 1988), 125; original in *Spinoza: Philosophie pratique* (Paris: Les Éditions de Minuit, 2003), 168.
9. A similar viewpoint is manifested in Leroi-Gourhan's treatment of the role of technique in evolution. See Audouze, "Leroi-Gourhan, a Philosopher of Technique and Evolution," 285-86.
10. Friedrich Nietzsche, *Writings from the Late Notebooks*, ed. Rüdiger Bittner, transl. Kate Sturge (Cambridge: Cambridge University Press, 2003), 14[120] (256); original in *Nachlass 1887-1889*, 14[120] (299).
11. The article was originally published in the *Contemporary Review* in 1897. It is reprinted in Vernon Lee and Clementina Anstruther-Thomson, *Beauty and Ugliness and Other Studies in Psychological Aesthetics* (London: John Lane, 1912), 156-239.
12. Lee and Anstruther-Thomson, *Beauty and Ugliness*, 172.
13. Ibid., 204 (emphasis in original).
14. Ibid., 228.
15. Ibid., 237.
16. Ibid., 235.
17. See Pierre Janet, *Névroses et idées fixes*, 3rd ed. (Paris: Félix Alcan, 1914), 217-18.
18. This notion of the synthesis of images comes close to Bergson's description of the kaleidoscopic perceptual field. But, as we shall see in chapter 6, Bergson's notion of the image is not limited to the psychological domain.
19. Janet, *L'Automatisme psychologique*, 194.
20. Ibid., 190-9, 305-14.
21. Ibid., 306.
22. See Onno van der Hart and Rudger Horst, "The Dissociation Theory of Pierre Janet," *Journal of Traumatic Stress* 2:4 (1989): 397-412.
23. See Janet, *L'Automatisme psychologique*, 36-66.
24. Ibid., 60.
25. Roger Caillois, "Mimicry and Legendary Psychasthenia," transl. John Shepley, in *October: The First Decade, 1976-1986*, ed. Annette Michelson (Cambridge, MA: The MIT Press, 1988), 65.
26. Ibid., 69.
27. Ibid., 72.

28. Miriam Hansen, *Babel and Babylon: Spectatorship in American Silent Film* (Cambridge, MA: Harvard University Press, 1991), 25-29.
29. Thomas Elsaesser, "Discipline through Diegesis: The Rube Film between 'Attractions' and 'Narrative Integration'," in *The Cinema of Attractions Reloaded*, ed. Wanda Strauven (Amsterdam: Amsterdam University Press, 2006), 205-23. Francesco Casetti also argues that *Uncle Josh* warns us to be naive spectators. See Casetti, *Eye of the Century*, 149.
30. The catalogue summary is reproduced for example in Noël Burch, *Life to those Shadows*, transl. Ben Brewster (Berkeley: University of California Press, 1990), 220.
31. Caillois, "Mimicry and Legendary Psychasthenia," 72.
32. Deleuze, *Difference and Repetition*, 70-79; 96-108.
33. Ibid., 71; 97.
34. See ibid., 78; 107.
35. Ibid., 74; 101.
36. Wanda Strauven, "Introduction to an Attractive Concept," in *The Cinema of Attractions Reloaded*, 17-19.
37. For an insightful treatment of the affect and its central place in contemporary media culture, see Massumi, *Parables for the Virtual*.
38. Jean Epstein, "On Certain Characteristics of *Photogénie*," transl. Tom Milne, in *French Film Theory and Criticism: A History / Anthology*, vol. 1, 1907-1929, ed. Richard Abel (Princeton, NJ: Princeton University Press, 1988), 314-18, quotation on 317. Original in Epstein, *Écrits*, vol. 1, 141. On Epstein's understanding of cinema experience, see Malcolm Turvey, "Jean Epstein's Cinema of Immanence: The Rehabilitation of the Corporeal Eye." *October* 83 (Winter 1998): 25-50.
39. Jean Epstein, "Magnification and Other Writings," transl. Stuart Liebman, *October* 3 (Spring 1977): 13. Original in Epstein, "Grossissement," in *Écrits*, vol. 1, 98.
40. Münsterberg, *The Photoplay*, 154.
41. Deleuze, *Cinema 1*, 87-101; 125-44.
42. See Bergson, *Matter and Memory*, 56-61; 204-9. For a critical take on Deleuze's reading of Bergson in the context of film studies, see Mark B. N. Hansen, *New Philosophy for New Media* (Cambridge, MA: The MIT Press, 2004), 223-26.
43. Stern, *The Interpersonal World of the Infant*, 54; Stern, *The Present Moment*, 64-65.
44. Stern, *The Present Moment*, 246.
45. Stern, *The Interpersonal Life of the Infant*, 152.
46. For a discussion and application of Stern's theory in film studies, which has been of great inspiration to our treatment, see Raymond Bellour, "Le dépli des émotions," *Trafic* 43 (Autumn 2002): 93-128; Bellour, "Daniel Stern, encore," *Trafic* 57 (Spring 2006): 52-62.
47. Quoted in Mark B. Sandberg, *Living Pictures, Missing Persons: Mannequins, Museums, and Modernity* (Princeton, NJ: Princeton University Press, 2004), 9.
48. Massumi, *Parables for the Virtual*, 35.
49. Béla Balázs, "Visible Man," transl. Rodney Livingstone, *Screen* 48:1 (2007): 96-108, quotation on 100 (emphasis in original).
50. André Gaudreault, "Fragmentation and Segmentation in the Lumière 'Animated Views'," transl. Timothy Barnard, *The Moving Image* 3 (Spring 2003): 111-31.
51. Stern, *The Present Moment*, 246.
52. Ibid., 41.

53. Ibid., 51.
54. Bellour, "Daniel Stern, encore," 56-58.
55. Deleuze, *Cinema 1*, 27; 43.
56. See, e.g., André Gaudreault, "Detours in Film Narrative: The Development of Cross-Cutting," *Cinema Journal* 19:1 (1979): 39-59.
57. Crary, *Suspensions of Perception*, 347.
58. Stern, *The Present Moment*, 55-62, quotation on 60-61.
59. See ibid., 75-96.
60. See Bergson, *Matter and Memory*, 61; 209.
61. Ibid., 21; 172.
62. Stern, *The Present Moment*, 103-11.
63. Ibid., 145.
64. Vivian Sobchack, *Carnal Thoughts: Embodiment and Moving Image Culture* (Los Angeles: University of California Press, 2004), 79.
65. See Deleuze, *Difference and Repetition*, 75; 102.
66. Gilbert Simondon, *L'Individu et sa genèse physico-biologique* (Paris: Presses Universitaires de France, 1964).
67. George Canguilhem, "The Living and Its Milieu," transl. John Savage, *Grey Room* 3 (Spring 2001): 21.
68. Deleuze, *Cinema 1*, 186; 253.
69. Ibid., 123, 141; 173, 196-97.
70. Simondon, *L'Individu et sa genèse physico-biologique*, 233-36.
71. Michael Allen, *Family Secrets: The Feature Films of D. W. Griffith* (London: British Film Institute, 1999), 151.
72. See ibid., 157.
73. Casetti, *Eye of the Century*, 119-20.
74. Ibid., 152.
75. Notably, von Uexküll also applied his views in biology into theorizing the organization of the body politic. On Uexküll and biopolitics, see *Esposito: Bíos: Biopolitics and Philosophy*, 17-19.
76. Jakob von Uexküll, "A Stroll through the Worlds of Animals and Men: A Picture Book of Invisible Worlds," transl. Claire H. Schiller, *Semiotica* 89 (1992): 327.
77. Ibid., 319.
78. Ibid., 323.
79. Keith Ansell Pearson, *Germinal Life: The Difference and Repetition of Deleuze* (London: Routledge, 1999), 187.
80. Uexküll, "A Stroll," 326, 340, 391n4.
81. Canguilhem, "The Living and Its Milieu," 19.
82. Joseph Roth, "Knigge im Film," in *Werke*, vol. 1, *Das Journalistische Werk 1915-1923*, ed. Klaus Westermann (Cologne: Kiepenhauer & Witsch, 1989), 29-30.
83. On Roth's story as well as other views from the 1910s to the 1930s on the transmission and organization of gestures in the cinema, see Gadi Algazi, "Norbert Elias's Motion Pictures: History, Cinema and Gestures in the Process of Civilization," *Studies in History and Philosophy of Science* 39:3 (2008): 451-55.
84. See Martin Heidegger, *Contributions to Philosophy (From Enowning)*, transl. Parvis Emad and Kenneth Maly (Bloomington: Indiana University Press, 1999), 88-100; Heidegger, *Mindfulness*, transl. Parvis Emad and Thomas Kalary (London: Conti-

nuum, 2006), 11-19. When it comes to the biopolitical context, Heidegger's thinking has many affinities with Ernst Jünger's who thought that cinema and the gramophone confront the subject with her/his own "mirror-image" and create a "second space inaccessible to sensibility [*Empfindsamkeit*]." By letting us observe our own movements on the screen or listen to our own voice as if it were a stranger's, modern technological media produce a subject distinguished by a "second consciousness," a consciousness which enables the subject to perceive her/himself as an object. Technological media transport the subject to a new sphere of sensations and perceptions. This is an objectified sphere driven by somewhat sado-masochistic desires: in it, pain, for example, becomes a mere illusion. For Jünger, the cinema thus amounts to a change in "lifestyle" (*Lebensart*) and gives birth to a type of disciplined and uniformed "flesh" (*Fleisch*) that has become insensitive to injury and even death. See Ernst Jünger, "Über den Schmerz," in *Werke*, vol. 5, *Essays I* (Stuttgart: Ernst Klett, 1960), 187-93. See also Carsten Strathausen, "The Return of the Gaze: Stereoscopic Vision in Junger and Benjamin," *New German Critique* 80 (2000): 125-48. On Jünger and Heidegger, see Michael E. Zimmerman, *Heidegger's Confrontation With Modernity: Technology, Politics, Art* (Bloomington: Indiana University Press, 1990), 66-93.

85. Heidegger, *Mindfulness*, 24.
86. Foucault, "The Subject and Power," in *Essential Works of Foucault 1954-1984*, vol. 3, *Power*, 336.
87. Foucault, *Society Must Be Defended*, 245.
88. Martin Heidegger, *The Fundamental Concepts of Metaphysics: World, Finitude, Solitude*, transl. William McNeill and Nicholas Walker (Bloomington: Indiana University Press, 1995), 201-73.
89. Martin Heidegger, "Overcoming Metaphysics," in *The Heidegger Controversy: A Critical Reader*, ed. Richard Wolin (Cambridge, MA: The MIT Press, 1992), 86.
90. Heidegger, *The Fundamental Concepts*, 239.
91. Ibid., 240.
92. Ibid., 255.
93. Agamben, *The Open*, 51. On Uexküll, see Heidegger, *The Fundamental Concepts*, 263-64.
94. See Esposito, *Bíos: Biopolitics and Philosophy*, 152-57.
95. "Logos" does not here mean rationality in the sense of the "ratio" in *animal rationale*. Instead, it refers to the gathering of Being in non-representational thought that Heidegger specifically associates with the pre-Socratic thinkers.

Chapter 4

1. The following analysis is based on the Dutch print of *Kador*.
2. See Aristotle *On Interpretation* 16a27-29.
3. For the following treatment, see Trond Lundemo's analysis of *Kador* in "Technologies of Forgetting: Cinema and Recollection in *Le mystère des roches de Kador*," in *Film*

and Its Multiples: IX International Film Studies Conference, ed. Anna Antonini (Udine: Forum, 2003), 283-90.

4. Giorgio Agamben, "On Potentiality," in *Potentialities: Collected Essays in Philosophy*, transl. and ed. Daniel-Heller-Roazen (Stanford: Stanford University Press, 1999), 178-79.
5. Ian Hacking, *Rewriting the Soul: Multiple Personalities and the Sciences of Memory* (Princeton, NJ: Princeton University Press, 1998), 198-209.
6. For this case, see Eugène Azam, *Hypnotisme et double conscience: Origine de leur étude et divers travaux sur des sujets analogues* (Paris: Félix Alcan, 1893), 41-102. See also Hacking, *Rewriting the Soul*, 159-70.
7. Azam, *Hypnotisme et double conscience*, 56-57.
8. Ibid., 59.
9. Hacking, *Rewriting the Soul*, 164.
10. Breuer and Freud, for example, made frequent use of Azam's terminology of first and second states. Moreover, they argue: "The longer we have been occupied with these phenomena the more we have become convinced that *the splitting of consciousness which is so striking in the well-known classical cases under the form of* 'double conscience' *is present to a rudimentary degree in every hysteria, and that a tendency to such a dissociation, and with the emergence of abnormal states of consciousness (which we shall bring together under the term 'hypnoid') is the basic phenomenon of this neurosis*." Joseph Breuer and Sigmund Freud, *Studies on Hysteria*, in *SE*, 2:12 (emphasis in original).
11. Jules Janet, "L'Hystérie et l'hypnotisme d'après la théorie de la double personnalité," *Revue Scientifique* 15 (1888): 616-23.
12. Ellenberger, *The Discovery of the Unconscious*, 353.
13. Janet, *L'Automatisme psychologique*, 21-30.
14. Ibid., 223-69, 304-14, 335-45; Janet, *Névroses et idées fixes*, 145, 395.
15. See de Marneffe, "Looking and Listening," 102; Jay, *Downcast Eyes*, 334.
16. Breuer and Freud, *Studies on Hysteria*, 6.
17. Ibid., 139.
18. Deleuze, *Cinema 2*, 78-83; 105-11. In *Cinema 2*, Deleuze sees this temporal constellation as characteristic of post-Second World War cinema such as Italian neo-realism and the French New Wave. He argues that, after the war, a new mode of filmic expression emerged that was not based on functional sensorimotor linkages but more on what he calls pure optical and sound situations manifesting temporal relations and noetic connections. Deleuze seems to suggest that these relations of time apply only to post-1945 cinema. In our view, however, Deleuze's historically specific mapping can only be schematic by nature and the concepts proposed by Deleuze in the *Cinema* books should not be restricted to the historical development of filmic styles or to what he calls the "natural history of cinema."
19. Deleuze, *Cinema 2*, 3; 9.
20. Henri Bergson, *Mind – Energy: Lectures and Essays*, transl. H. Wildon Carr (Westport, CT: Greenwood Press, 1975), 134; original in *L'Énergie spirituelle: Essais et conférences*, in *Œuvres*, 897 (henceforth, French pagination will be listed after the English).
21. Sigmund Freud, "Draft M," in *SE*, 1:250-1. The draft is dated May 25, 1897.
22. Sigmund Freud, *Beyond the Pleasure Principle*, in *SE*, 18:22.

23. Freud to his family, Rome, September 22, 1907, in *Unser Hertz zeigt nach dem Süden: Reisebriefe 1895-1923*, ed. Christfried Tögel and Michael Molnar (Berlin: Aufbau Taschenbuch, 2003), 224-27. See also Crary, *Suspensions of Perception*, 362-70.
24. Surely, the (static) image does manifest psychic forces for Freud, and thus may become an object of analysis in terms of opening up a gateway to the psyche. In *Leonardo Da Vinci and a Memory of His Childhood* Freud wrote, "Kindly nature has given the artist the ability to express his most secret mental impulses, which are hidden even from himself, by means of the works that he creates…" Sigmund Freud, *Leonardo Da Vinci and a Memory of His Childhood*, in *SE*, 11:107. In Freud's analysis, Da Vinci's painting *The Virgin and Child with St. Anne* becomes an expression of the artist's childhood experiences as well as fantasies. However, one could say that the image itself does not provide a mode of intelligence; like the unconscious, following Freud's famous formulation, it "does not think."
25. Freud to Karl Abraham, June 9, 1925, in *The Complete Correspondence of Sigmund Freud and Karl Abraham: 1907-1925*, ed. Ernst Falzeder, transl. Caroline Schwarzacher (London: Karnac, 2002), 547. However, Abraham and Sachs insist that, indeed, a "psychoanalytic film" is achievable: "We think we have succeeded in principle in presenting the most abstract concepts." Abraham to Freud, July 18, 1925 (ibid., 551).
26. See Stephen Heath, "Cinema and Psychoanalysis: Parallel Histories," in *Endless Night: Cinema and Psychoanalysis, Parallel Histories*, ed. Janet Bergstrom (Berkeley: University of California Press, 1999), 27.
27. Doane, *The Emergence of Cinematic Time*, 61-68.
28. Breuer and Freud, *Studies on Hysteria*, 280-1.
29. See Crary, *Suspensions of Perception*, 368; Jean Laplance and J.-B. Pontalis, *Vocabulaire de la psychanalyse* (Paris: Presses Universitaires de France, 2004), 38-40; Kittler, *Discourse Networks 1800/1900*, 283-84.
30. Sigmund Freud, "Recommendations to Physicians Practising Psycho-Analysis," in *SE*, 12:116.
31. Sigmund Freud, *The Interpretation of Dreams*, in *SE*, 4-5:103. Freud in this way reiterates the positivist attitude of his master, Charcot, who fashioned himself into a photographic plate that simply inscribes what occurs. See Baer, "Photography and Hysteria," 48.
32. Freud, *The Interpretation of Dreams*, 48-49, 536.
33. Ibid., 536-37.
34. On *camera obscura* and related epistemology, see Crary, *Techniques of the Observer* 25-66; Jay, *Downcast Eyes*, 65-69, 85.
35. Freud, *The Interpretation of Dreams*, 538.
36. Breuer and Freud, *Studies on Hysteria*, 188-89n1.
37. Sigmund Freud, "A Note upon the 'Mystic Writing-Pad," in *SE*, 19:227-32.
38. Freud, *The Interpretation of Dreams*, 577.
39. Sigmund Freud, "Project for a Scientific Psychology," in *SE*, 1:300. See also Laplanche and Pontalis, *Vocabulaire de la psychanalyse*, 491.
40. Freud, "The Mystic Writing-Pad," 232.
41. Jacques Derrida, "Freud and the Scene of Writing," transl. Jeffrey Mehlman, *Yale French Studies* 48 (1972): 84, 114.
42. Freud, "The Mystic Writing-Pad," 230.
43. Doane, *The Emergence of Cinematic Time*, 42.

44. Deleuze, *The Logic of Sense*, 78-93; 83-100.
45. The following is based on John Forrester's treatment in *Language and the Origins of Psychoanalysis* (London: The Macmillan Press, 1980), 14-39. On the importance of Freud's early study on aphasia for his overall project, see also S.P. Fullinwider, "Sigmund Freud, John Hughlings Jackson, and Speech," *Journal of the History of Ideas* 44:1 (1983): 151-58; Anne Harrington, *Medicine, Mind, and the Double Brain: A Study in Nineteenth-Century Thought* (Princeton, NJ: Princeton University Press, 1989), 235-47; Kittler, *Discourse Networks 1800/1900*, 278-79.
46. Freud, "Project for a Scientific Psychology," 296-97, 326-27.
47. Ibid., 365, 372. For the distinction between the unconscious, preconscious and consciousness in terms of linguistic formulation, see Sigmund Freud, "The Unconscious," in *SE*, 14:200-4.
48. See Forrester, *Language and the Origins of Psychoanalysis*, 27-29.
49. Sigmund Freud, *The Ego and the Id*, in *SE*, 19:21
50. Freud, "The Unconscious," 201.
51. See, e.g., Freud, *The Interpretation of Dreams*, 542-49.
52. Freud to Wilhelm Fliess, December 6, 1896, in *The Complete Letters of Sigmund Freud to Wilhelm Fliess 1887-1904*, transl. and ed. Jeffrey Moussaieff Masson (Cambridge, MA: Belknap Press, 1985), 208.
53. Daniel Heller-Roazen, *Echolalias: On the Forgetting of Language* (New York: Zone Books, 2005), 142.
54. Ibid., 145.
55. Michel Foucault, "Nietzsche, Freud, Marx," in *Dits et écrits: 1954-1988*, eds. Daniel Defert and François Ewald (Paris: Gallimard, 1994), 1:572.
56. Freud, *The Interpretation of Dreams*, 317-18.
57. Ibid., 303, 318.
58. Kittler, *Discourse Networks 1800/1900*, 274.
59. Freud, *The Interpretation of Dreams*, 303.
60. Kittler, *Discourse Networks 1800/1900*, 273-91.
61. See, Ebbinghaus, *Memory*. On Ebbinghaus, see Kittler, *Discourse Networks 1800/1900*, 206-15, 218-20.
62. See especially Breuer and Freud, *Studies on Hysteria*, 135-81.
63. On this problematic in more detail, see Monique David-Ménard, *Hysteria from Freud to Lacan: Body and Language in Psychoanalysis*, transl. Catherine Porter (Ithaca, NY: Cornell University Press, 1989).
64. Breuer and Freud, *Studies on Hysteria*, 181.
65. Sigmund Freud, *The Psychopathology of Everyday Life*, in *SE*, 6:48.
66. Ibid.
67. Kittler, *Discourse Networks 1800/1900*, 281-82.
68. Stéphane Mallarmé, *Variations sur un sujet*, in *Œuvres completes*, ed. Henri Mondor and G. Jean-Aubry (Paris: Gallimard, 1945), 366.
69. Stéphane Mallarmé, "Preface," in *Collected Poems*, transl. Henry Weinfield (Berkeley: University of California Press, 1994), 121.
70. Paul Valéry, *Varété II* (1929), quoted in Mallarmé, *Œuvres*, 1582. On words as moving images in *Un coup de dés*, see also Gerhard Neumann, "Wahrnehmungs-Theater: Semiose zwischen Bild und Schrift," in *Inszenierungen in Schrift und Bild*, eds. Gerhard Neumann and Claudia Öhlschläger (Bielefeld: Aisthesis Verlag, 2004), 88-89.

71. On letters and other signs of writing in classical cinema, see Tom Conley, *Film Hieroglyphs: Ruptures in Classical Cinema* (Minneapolis: University of Minnesota Press, 2006). Conley focuses, among other things, on how writing engages indeterminacy and destabilization of meaning in the image.
72. Mallarmé, *Variations sur un sujet*, 368.
73. See Gotthold Ephraim Lessing, *Laokoon, oder über die Grenzen der Malerei und Poesie* (Stuttgart: Philipp Reclam Jun., 2003), 114-21.
74. Michel Foucault, "Ceci n'est pas une pipe," transl. Richard Howard, *October* 1 (1976): 12.
75. Magritte in Foucault, "Ceci n'est pas une pipe," 15.
76. Rodowick, *Reading the Figural*, 1-75. On the history and theory behind the concept of the figural, see also François Aubral, "Variations figurales," in *Figure, figural*, eds. François Aubral and Dominique Chateau (Paris: L'Harmattan, 1999), 197-243.
77. On the figural in the cinema, see also Philippe Dubois, "L'Écriture figurale dans le cinéma muet des années 20," in *Figure, figural*, 245-74. Dubois approached the figural as something situated between the sayable and the visible, knowledge and seeing, or word and image, signification and resemblance. The figural is a force, which confuses the clear-cut separations between the two. As such, according to Dubois, it presents a special kind of "fabric of visual thought."
78. Rodowick, *Reading the Figural*, 69.
79. Freud, *The Interpretation of Dreams*, 507.
80. See Rodowick, *Reading the Figural*, 11-12.
81. Freud to Fliess, September 21, 1897, in *The Complete Letters of Sigmund Freud to Wilhelm Fliess*, 264-66. See also Freud, *On the History of the Psycho-Analytic Movement*, in *SE*, 14:17-18.
82. Sigmund Freud, "Formulations on the Two Principles of Mental Functioning," in *SE*, 12:225.
83. Gilles Deleuze and Félix Guattari, *L'Anti-Œdipe: Capitalisme et schizophrénie* (Paris: Les Éditions de Minuit, 1972), 63.
84. Gilles Deleuze, "Quatre propositions sur la psychanalyse," in *Deux régimes de fous: Textes et entretiens 1975-1995*, ed. David Lapoujade (Paris: Les Éditions de Minuit, 2003), 74-78. See also the critique of psychoanalysis and Oedipus in Deleuze and Guattari, *L'anti-Œdipe*, 60-162.
85. Unraveling these directions goes beyond the limits of this study. To note in passing, one direction includes the techniques of subjectivation and normalization in disciplinary societies as well as Western culture more generally. On psychoanalysis and its therapeutic practice in this regard, see, e.g., Foucault, *The Will to Knowledge*, 115-31.
86. See Deleuze and Guattari, *What is Philosophy?*, 39-41; 42-43.

Chapter 5

1. Joris Ivens, *The Camera and I* (New York: International Publishers, 1969), 26.
2. Deleuze, *Difference and Repetition*, 70-91; 96-123.

3. Ibid., 125; 163.
4. Heidegger writes, "The Greek sense of 'image' – if we may use this word at all – is a 'coming to the fore,' *phantasia*, understood as 'coming to presence.' With the transformation of the Greek concept of Being in the course of the history of metaphysics, the Western *concept of the image* changes accordingly. In antiquity, in the Middle Ages, in the modern period, 'image' is different not only with regard to content and name but also with regard to essence." Martin Heidegger, *The Will to Power as Knowledge and Metaphysics*, vol. 3 of *Nietzsche*, transl. Joan Stambaugh, David Farrell Krell and Frank A. Capuzzi, ed. David Farrell Krell (San Francisco: HarperCollins, 1991), 29; original in *Nietzsche I*, vol. 6 of *Gesamtausgabe*, ed. Brigitte Schillbach (Frankfurt am Main: Vittorio Klostermann, 1996), 454 (henceforth, German pagination will be listed after the English).
5. Ibid., 29-31; 454-56.
6. Friedrich Nietzsche, *Thus Spoke Zarathustra: A Book for All and None*, eds. Adrian del Caro and Robert B. Pippin, transl. Adrian del Caro (Cambridge: Cambridge University Press, 2006), 20; original in *Also sprach Zarathustra*, in *KSA*, 4:35 (henceforth, German pagination will be listed after the English).
7. Ibid., 20; 35.
8. In the following, I shall consistently translate *Schein* as "semblance," the verbal form *scheinen* as "seem" and *Scheinbarkeit* as "semblancy." In this way, *Schein* is to be distinguished from *Erscheinung*, which will be translated as "appearance" (and the verbal from *erscheinen* as "appear"). For the translation as well as the concept of *Schein* in Nietzsche's thought more generally, see Robert Rethy, "*Schein* in Nietzsche's Philosophy," in *Nietzsche and Modern German Thought*, ed. Keith Ansell Pearson (London: Routledge, 1991), 59-87. See also Gary Shapiro, *Archaeologies of Vision: Foucault and Nietzsche on Seeing and Saying* (Chicago: University of Chicago Press, 2003), 97-98.
9. The notion of *Schein* derives already from Nietzsche's early work, notably *The Birth of Tragedy* where Nietzsche, on the one hand, makes the famous distinction between Apollonian *Schein* and Dionysian *Rausch*. In aesthetic terms, the former is defined as belonging to the category of the beautiful and especially incorporated into image-based arts (*Bildende Kunst*), whereas the latter characterizes "imageless" music, the violence of sounds and rhythmic movement that expels stable forms (*Gestalt*) in favor of painful, overwhelming and world-shaking emotions. On the other hand, in terms of what Nietzsche in his retrospective "Attempt at a Self-Critique" calls "artist's metaphysics," the two aesthetic drives (*Trieb*) characterize two poles of art that is defined as "the true metaphysical activity of man." Art itself is inseparable from life, which at this stage in Nietzsche's thinking is understood in terms of the eternally suffering and contradicting "primordial unity" (*Ur-Ein*). This alienated Nature is set free in the Dionysian *Rausch*, and man becomes united with the world. Dionysus abolishes (*aufheben*) and annihilates (*vernichten*) what Apollonian *Schein* creates: the "redemption" (*Erlösung*) of the primordial unity in laws and measures. Friedrich Nietzsche, *"The Birth of Tragedy" and other Writings*, eds. Raymond Geuss and Ronald Speirs, transl. Ronald Speirs (Cambridge: Cambridge University Press, 1999), 5, 8, 18, 25-26, 27-28; original in *Die Geburt der Tragödie*, in *KSA*, 1:13, 17, 30, 38, 41 (henceforth, German pagination will be listed after the English).
10. Nietzsche, *Nachlass 1884-1885*, in *KSA*, 11:25[11] (44).

11. Friedrich Nietzsche, *The Gay Science*, ed. Bernard Williams, transl. Josefine Nauckhoff (Cambridge: Cambridge University Press, 2001), 63 (translation modified); original in *Die fröhliche Wissenschaft*, in *KSA*, 3:417 (henceforth, German pagination will be listed after the English).
12. Nietzsche, *The Will to Power*, 568 (306) (translation modified); *Nachlass 1887-1889*, 14 [93] (271). See also Nietzsche, *Nachlass 1884-1885*, 40[53] (654).
13. Friedrich Nietzsche, "On Truth and Lying in a Non-Moral Sense," in *The Birth of Tragedy and Other Writings*, eds. Raymond Geuss and Ronald Speirs, transl. Ronald Speirs (Cambridge: Cambridge University Press, 1999), 141-53; original in "Ueber Wahrheit und Lüge im aussermoralischen Sinne," in *KSA*, 1:873-90 (henceforth, German pagination will be listed after the English). See also Kittler, *Discourse Networks 1800/1900*, 187.
14. Nietzsche writes: "The 'thing-in-itself' (which would be, precisely, pure truth, truth without consequences) is impossible for even the creator of language to grasp, and indeed this is not at all desirable. He designates only the relations of things to human beings, and in order to express them he avails himself of the boldest metaphors." Nietzsche, "On Truth and Lying," 144; 879.
15. Kittler, *Discourse Networks 1800/1900*, 188.
16. Friedrich Nietzsche, *Human, All Too Human: A Book for Free Spirits*, transl. R.J. Hollingdale (Cambridge: Cambridge University Press, 1996), 18; original in *Menschliches, Allzumenschliches: Ein Buch für freie Geister*, in *KSA*, 2:34 (henceforth, German pagination will be listed after the English).
17. Ibid., 18; 34.
18. Nietzsche, *Will to Power*, 569 (307); *Nachlass 1885-1887*, in *KSA*, 12:9[106] (395-96).
19. See, e.g., Nietzsche, *Will to Power*, 625 (334); *Nachlass 1887-1889*, 14[122] (302).
20. Nietzsche, *Will to Power*, 635 (339); *Nachlass 1887-1889*, 14[79] (259).
21. Deleuze, *Nietzsche and Philosophy*, 47; 58.
22. Friedrich Nietzsche, *Beyond Good and Evil: Prelude to a Philosophy of the Future*, transl. Judith Norman, eds. Rolf-Peter Horstmann and Judith Norman (Cambridge: Cambridge University Press, 2002), 36; original in *Jenseits von Gut und Böse: Vorspiel einer Philosophie der Zukunft*, in *KSA*, 5:55 (henceforth, German pagination will be listed after the English).
23. See Deleuze, *Nietzsche and Philosophy*, 23, 85; 27-28, 104.
24. Nietzsche, *Will to Power*, 1067 (550); *Nachlass 1884-1885*, 38[12] (610-11).
25. See Kittler, *Eine Kulturgeschichte der Kulturwissenschaft*, 170.
26. Nietzsche, *Nachlass 1885-1887*, 1[28] (16).
27. Nietzsche, *The Birth of Tragedy*, 104 (translation modified); 140. The original German reads: "*als ob jetzt die Sehkraft... nicht nur eine Flächenkraft sei, sondern in's Innere zu dringen vermöge, und als ob die Wallungen des Willens, den Kampf der Motive, den anschwellenden Strom der Leidenschaften, jetzt,... gleichsam sinnlich sichtbar, wie eine Fülle lebendig bewegter Linien und Figuren vor sich sehe...*"
28. Nietzsche, *Will to Power*, 617 (330); *Nachlass 1885-1887*, 7[54] (312).
29. Heidegger, *The Will to Power as Knowledge and Metaphysics*, 77; 506.
30. Ibid., 80; 509-10.
31. Ibid., 156; 592.
32. Ibid., 82; 512.
33. Nietzsche, *Nachlass 1880-1882*, in *KSA*, 9:11[157] (502).

34. The following interpretation of this excerpt is based on both Agamben's and Deleuze's analyses. See Agamben, "L'Image immémoriale," in *Image et mémoire: Écrits sur l'image, la danse et le cinema*, transl. Marco Dell'Omodarme et al. (Paris: Desclée de Brouwer, 2004), 97-110; Deleuze, *Nietzsche and Philosophy*, 23-27; 27-33.
35. Agamben, "L'Image immémoriale," 105.
36. "'[L]ines and shapes' were thus not originally given. Instead, thinking has longest been based on the sense of touch: yet this, if it is *not* supported by the eyes, only teaches degrees of pressure, not shapes. Thus, before we started practising our understanding of the world as moving shapes, there was a time when the world was 'grasped' as changing sensations of pressure of various degrees." Nietzsche, *Writings from the Late Notebooks*, 40[28] (45); Nietzsche, *Nachlass 1884-1885*, 40[28] (644).
37. Kittler, *Gramophone, Film, Typewriter*, 200.
38. See ibid., 202. In fact, the machine was initially designed for visually impaired persons.
39. Kittler, *Discourse Networks 1800/1900*, 195.
40. Ibid., 177-205. On Nietzsche's conception of writing and the typewriter, see also Kittler, *Gramophone, Film, Typewriter*, 200-10; Christof Windgätter, "Rauschen: Nietzsche und die Materialitäten der Schrift," *Nietzsche-Studien* 33 (2004): 1-36.
41. On the traditional understanding of the sign and its metaphysical bearings, see Giorgio Agamben, *Stanze: Parole et fantasme dans la culture occidentale*, transl. Yves Hersant (Paris: Éditions Payot and Rivages, 1998), 225-33.
42. Nietzsche to Heinrich Köselitz, February 1882, as printed in Nietzsche, *Schreibmaschinentexte*, ed. Stephan Güntzel and Rüdiger Schmidt-Grépály (Weimar: Bauhaus Universitätsverlag, 2002), 18, quoted in Windgätter, "Rauschen," 22.
43. Windgätter, "Rauschen," 5, 18-21.
44. Ibid., 19.
45. Pierre Klossowski, *Nietzsche and the Vicious Circle*, transl. Daniel W. Smith (London: Continuum, 2005), 29.
46. Nietzsche, *Will to Power*, 522 (283); *Nachlass 1885-1887*, 5[22] (193); cf. 6[13] (237).
47. See, e.g., Friedrich Nietzsche, *Ecce Homo*, in *The Anti-Christ, Ecce Homo, Twilight of the Idols, and Other Writings*, transl. Judith Norman, eds. Aaron Ridley and Judith Norman (Cambridge: Cambridge University Press, 2005), 131; original in *Ecce homo*, in *KSA*, 6:268 (henceforth, German pagination will be listed after the English).
48. Nietzsche, *Thus Spoke Zarathustra*, 175; 272.
49. Nietzsche, *Ecce Homo*, 130; 343-44. On the aphoristic expression, see also Klossowski, *Nietzsche and the Vicious Circle*, 197-98.
50. See Deleuze, *Nietzsche and Philosophy*, 30-31; 37-39.
51. Mallarmé, *A Throw of the Dice / Un coup de dés*, in *Collected Poems*, 144-45.
52. Neumann, "Semiose zwischen Bild und Schrift," 92.
53. Aristotle, *On Interpretation*, in *The Categories, On Interpretation, Prior Analytics*, transl. Harold P. Cooke, Loeb Classical Library (Cambridge, MA: Harvard University Press, 2002), 16a3-7.
54. Agamben, "The Thing Itself," 37. On Aristotle's *gramma*, see also Agamben, *Le langage et la mort*, 79-82. On the substance, presupposition and essence in Aristotle, see Miguel de Beistegui, *Truth and Genesis: Philosophy as Differential Ontology* (Bloomington: Indiana University Press, 2004), 34-48.

55. The treatment of Lintsbach is based on Yury Tsivian's translation of the Chapter 17 of Lintsbach's book as well as on Tsivian's introduction in Yury Tsivian, "Jakob Lintsbach as Film Semiotician," *Elementa* 4 (1998): 121-29.
56. Ibid., 123.
57. Ibid., 124.
58. Hans Richter, "Demonstration of the 'Universal Language'," transl. Harald Stadler, in *Hans Richter: Activism, Modernism, and the Avant-Garde*, ed. Stephen C. Foster (Cambridge, MA: The MIT Press, 1998), 185-239. See also Hans Richter, "My Experience with Movement in Painting and in Film," in *The Nature and Art of Motion*, ed. Gyorgy Kepes (New York: George Braziller, 1965), 143-45. On Richter's notions of universal language, see e.g. Malcolm Turvey, "Dada Between Heaven and Hell: Abstraction and Universal Language in the *Rhythm* Films of Hans Richter," *October* 105 (Summer 2003): 24-29.
59. Richter, "My Experience with Movement in Painting and in Film," 144.
60. On these traditions in the early modern period, see Paolo Rossi, *Logic and the Art of Memory: The Quest for a Universal Language*, transl. Stephen Clucas (Chicago: University of Chicago Press, 2000).
61. For the following treatment of Leibniz's project, see Hubertus Busche, *Leibniz' Weg ins perspektivische Universum: Eine Harmonie im Zeitalter der Berechnung* (Hamburg: Felix Meiner Verlar, 1997), 120-68; Rossi, *Logic and the Art of Memory*, 176-93.
62. Nietzsche, *Thus Spoke Zarathustra*, 66; 110.
63. Friedrich Kluge, *Etymologisches Wörterbuch der deutschen Sprache*, 23rd ed. (Berlin: de Gruyter, 1999); Agamben, "L'Image immémoriale," 98.
64. Deleuze, *Nietzsche and Philosophy*, 45; 54-55. It is to be noted that Nietzsche's eternal return is here understood according to Deleuze's interpretation and that Deleuze's view itself is of course highly influenced by the aspirations of his own philosophy and not perhaps most faithful to the many and even contradictory aspects of Nietzsche's thought in this respect.
65. Albert Blanqui, *L'Éternité par les astres: hypothèse astronomique* (Paris: Librairie Germer Baillière, 1872), 73-74.
66. Nietzsche, *Nachlass 1869-1874*, in *KSA*, 7:26[12] (579); English translation in Friedrich Nietzsche, "Time-Atom Theory: Nachgelassene Fragmente, Early 1873," transl. Carol Diethe, *Pli: The Warwick Journal of Philosophy* 9 (2000): 1-5. For different interpretations of the fragment, see Keith Ansell Pearson, "Nietzsche's Brave New World of Force," *Pli: The Warwick Journal of Philosophy* 9 (2000): 6-35; Claudia Crawford, "Nietzsche's Overhuman: Creating on the Crest of the Timepoint," *Journal of Nietzsche Studies* 30 (2005): 22-48.
67. Nietzsche, "Time-Atom Theory," 3.
68. On the notion of moment in Nietzsche, see Keith Ansell Pearson, "The Eternal Recurrence of the Overhuman: The Weightiest Knowledge and the Abyss of Light," *Journal of Nietzsche Studies* 30 (2005): 1-21.
69. Nietzsche, *Nachlass 1880-1882*, 11[156] (502).
70. Shapiro, *Archaeologies of Vision*, 1-191.
71. Nietzsche, *Thus Spoke Zarathustra*, 125; 199.
72. Ibid., 125; 199-200.
73. However, Blanqui, while in his prison cell, had already experienced an original "defect" in the thought of the eternal return because it lacks a sense of progress. This

seems to be a direction to which Nietzsche's notion of the eternal return also points. In a later fragment, Nietzsche wrote: "If the world may be thought of as a certain definite quantity of force and as a certain definite number of centres of force – and every other representation remains indefinite and therefore useless – it follows that, in the great dice game of existence, it must pass through a calculable number of combinations. In infinite time, every possible combination would at some time or another be realized; more: it would be realized an infinite number of times. And since between every combination and its next 'recurrence' [*Wiederkehr*] all other possible combinations would have to take place, and each of these combinations conditions the entire sequence of combinations in the same series, a circular movement of absolutely identical series is thus demonstrated: the world as circular movement that has already repeated itself infinitely open and plays its game *in infinitum*." Nietzsche, *The Will to Power*, 1066 [549]; *Nachlass 1887-1889*, 14[188] (376). In other words, if the arrangement of time depends on the arrangements of events in space, the same state of the world recurs as identical to itself, and time turns back into itself.

74. See Shapiro, *Archaeologies of Vision*, 161.
75. See Aby Warburg, *Gesammelte Schriften: Studienausgabe*, vol. 2, bk.1, *Der Bilderatlas Mnemosyne*, ed. Martin Warnke (Berlin: Akademie Verlag, 2000).
76. Warburg has often based his theories on Nietzsche's notion of the Dionysian force in art and culture, concerning the notion of "pathos formula," for example. On Warburg and Nietzsche, see Georges Didi-Huberman, *L'Image survivante: Histoire du l'art et temps des fantômes selon Aby Warburg* (Paris: Les Éditions de Minuit, 2002), 126-76; Philippe-Alain Michaud, *Aby Warburg: Image in Motion*, transl. Sophie Hawkes (New York: Zone Books, 2004), 28-31.
77. Michaud, *Aby Warburg*, 240-91. Already in 1890 Warburg discussed the "attribution of movement" to figures, which does not happen in an isolated image but through a series of images connected with each other. Didi-Huberman, *L'Image survivante*, 484.
78. Didi-Huberman, *L'Image survivante*, 476.
79. According to the long tradition that began in ancient Rome, (artificial) memory is primarily considered in spatial terms, and based on places and images. Memory in this case is similar to a "palace" managed by discrete placements. For a comprehensive account of this tradition, see Frances A. Yates, *The Art of Memory* (London: Pimlico, 1992).
80. Didi-Huberman, *L'Image survivante*, 472.
81. See Giorgio Agamben, "*Nymphae*," in *Image et mémoire*, 44.
82. See Didi-Huberman, *L'Image survivante*, 321.
83. Deleuze, *Cinema 2*, 179-80; 234.
84. Didi-Huberman, *L'Image survivante*, 452, 487.
85. Nietzsche, *The Birth of Tragedy*, 43; 60. See also Shapiro, *Archaeologies of Vision*, 132.

Chapter 6

1. Henri Bergson, *The Creative Mind: An Introduction to Metaphysics*, transl. Mabelle L. Andison (Totowa, NJ: Littlefield, Adams & Co., 1975), 12; original in *La pensée et mouvant: Essais et conférences*, in *Œuvres*, 1254 (henceforth, French pagination will be listed after the English).
2. Leo Charney, *Empty Moments: Cinema, Modernity, and Drift* (Durham, NC: Duke University Press, 1998), 15-25.
3. Bergson, *Creative Evolution*, 272-370; 725-807.
4. Ibid., 306; 753 (emphasis in original).
5. Bergson wrote: "The impotence of speculative reason, as Kant has demonstrated it, is perhaps at bottom only the impotence of an intellect enslaved to certain necessities of bodily life and concerned with a matter which man has had to disorganize for the satisfaction of his wants. Our knowledge of things would thus no longer be relative to the fundamental structure of our mind, but only to its superficial and acquired habits, to the contingent form which it derives from our bodily functions and from our lower needs. The relativity of knowledge may not, then, be definitive." Bergson, *Matter and Memory*, 184; 321.
6. Bergson argues that "philosophy should be an effort to go beyond the human state [*la condition humaine*]." Bergson, *The Creative Mind*, 193; 1425. On surpassing the "human," see also Gilles Deleuze, *Bergsonism*, transl. Hugh Tomlinson and Barbara Habberjam (New York: Zone Books, 1991), 28; original in *Le bergsonisme* (Paris: Presses Universitaires de France, 1997), 19 (henceforth, French pagination will be listed after the English).
7. Bergson, *Creative Evolution*, 237; 696.
8. Bergson, *Matter and Memory*, 185; 321. Bergson wrote: "[T]here still remains to be reconstituted, with the infinitely small elements which we thus perceive of the real curve, the curve itself stretching out into the darkness behind them. In this sense the task of the philosopher, as we understand it, closely resembles that of the mathematician who determines a function by starting from the differential."
9. See Deleuze, *Cinema 1*, 4-8; 13-17. Georges Didi-Huberman, "La danse de toute chose," in Georges Didi-Huberman and Laurent Mannoni, *Mouvements de l'air: Étienne-Jules Marey, photographe des fluides* (Paris: Gallimard / Réunion des musées nationaux, 2004), 225-27.
10. Bergson, *Creative Evolution*, 318; 764.
11. Ibid., 331-34; 775-76.
12. Ibid., 336-38; 779-80. Bergson summarized his view: "The measuring of time never deals with duration as duration; what is counted is only a certain number of extremities of intervals, or *moments*, in short, virtual halts in time." Bergson, *The Creative Mind*, 12; 1254-55.
13. This is the major argument in Deleuze's overturning of Bergson in the beginning of *Cinema 1*. Deleuze asserts that the ontology of the cinema is most accurately described following Bergson's views on movement, matter, and time in *Matter and Memory*. Deleuze relates this to cinematic editing: "The evolution of the cinema, the conquest of its own essence or novelty, was to take place through montage, the mobile camera and the emancipation of the view point, which became separate from

projection. The shot would then stop being a spatial category and become a temporal one, and the section would no longer be immobile, but mobile. The cinema would rediscover that very movement-image of the first chapter of *Matter and Memory*." Deleuze, *Cinema 1*, 3; 12.

14. Doane, *The Emergence of Cinematic Time*.
15. Doane, *The Emergence of Cinematic Time*, 46-68; Didi-Huberman, "La danse de toute chose," 233-48.
16. Doane, *The Emergence of Cinematic Time*, 181.
17. On Einstein's theory and its scientific context, see Jürgen Renn, "Einstein's Invention of Brownian Motion," *Annalen der Physik* 14:1 (February 2005): S23-S37.
18. For the following treatment, see Stephen G. Brush, *The Kind of Motion We Call Heat: A History of the Kinetic Theory of Gases in the 19th Century*, bk. 2, *Statistical Physics and Irreversible Processes* (Amsterdam: North-Holland Publishing Company, 1976), 656-701; Robertro Maiocchi, "The Case of Brownian Motion," *British Journal for the History of Science* 23 (1990): 257-83.
19. Maiocchi, "The Case of Brownian Motion," 263-64.
20. See Scott Curtis, "Die kinematographische Methode: Das 'Bewegte Bild' und die Brownsche Bewegung," transl. Jörg Schweinitz, *Montage/av* 14:2 (2005): 23-43. On the difficulties in empirically translating the object of Einstein's theory, see Maiocchi, "The Case of Brownian Motion," 269-82.
21. Max Seddig, "Über die Messung der Temperaturabhängigkeit der Brownschen Molekularbewegung," *Physikalische Zeitschrift* 9:14 (1908): 465-68; Seddig, "Messung der Temperatur-Abhängigkeit der Brown-Zsigmondyschen Bewegung," *Zeitschrift für Anorganische Chemie* 73 (1911-1912): 360-84; Seddig, "Exakte Messung des Zeitintervalles bei kinematographischen Aufnahmen," *Jahrbuch für Photographie und Reproduktionstechnik* 26 (1912): 654-57.
22. Maiocchi, "The Case of Brownian Motion," 273.
23. Seddig, "Messung der Temperatur-Abhängigkeit der Brown-Zsigmondyschen Bewegung," 365.
24. Maiocchi, "The Case of Brownian Motion," 274.
25. See Curtis, "Die kinematographische Methode," 39.
26. Hermann Weyl, *The Continuum: A Critical Examination of the Foundation of Analysis*, transl. Stephen Pollard and Thomas Bole (New York: Dover, 1994), 91-92.
27. On Faraday and Thomson and the perception of matter as "lines of force," see Harman, *Energy, Force, and Matter*, 72-84.
28. Bergson, *Matter and Memory*, 200; 336.
29. Milič Čapek, *Bergson and Modern Physics: A Reinterpretation and Re-evaluation* (Dordrecht: D. Reidel, 1971), 271.
30. Bergson, *The Creative Mind*, 147; 1381-82 (emphasis in original).
31. See Keith Ansell Pearson, *Philosophy and the Adventure of the Virtual: Bergson and the Time of Life* (London: Routledge, 2001), 23.
32. Bergson, *Creative Evolution*, 9; 502; Bergson, *Matter and Memory*, 189; 325.
33. See Bergson, *Matter and Memory*, 34; 185.
34. Ibid., 38; 188.
35. Faure, *Fonction du cinéma*, 61.
36. Deleuze, *Bergsonism*, 116.
37. Bergson, *Creative Mind*, 41; 1284.

38. See Alia Al-Saji, "The Memory of Another Past: Bergson, Deleuze and a New Theory of Time," *Continental Philosophy Review* 37:2 (2004): 203-39.
39. Bergson, *Matter and Memory*, 35-38, 117; 185-87, 261. See also Al-Saji, "The Memory of Another Past," 219.
40. Bergson, *Matter and Memory*, 103-5; 249-50.
41. Ibid., 102; 248.
42. Bergson, *Mind – Energy*, 134-85; 897-930.
43. Ibid., 157; 913.
44. Ibid., 165; 917.
45. Ibid.
46. Ibid., 151-52, 161; 909, 915.
47. Ansell Pearson, *Philosophy and the Adventure of the Virtual*, 183. See also Bergson, *Matter and Memory*, 193-94; 342. Al-Saji, "The Memory of Another Past," 116.
48. Bergson, *Mind – Energy*, 160; 914.
49. Bergson, *Matter and Memory*, 104; 250.
50. Deleuze, *Bergsonism*, 59-60; 55.
51. Ibid., 25 (emphasis added); 15.
52. Bergson, *La pensée et le mouvant*, 140on1.
53. Bergson, *Time and Free Will*, 75-139; 51-92.
54. Ibid., 76-85; 52-58. See also Ansell Pearson, *Philosophy and the Adventure of the Virtual*, 19.
55. In *Matter and Memory*, Bergson reiterates his view that "language always translates movement and duration in terms of space." This also applies to the formal language of mathematics: "For the geometer all movement is relative: which signifies only, in our view, *that none of our mathematical symbols can express the fact that it is the moving body which is in motion rather than the axes or the points to which it is referred*." Bergson, *Matter and Memory*, 191, 194; 327, 330 (emphasis in original). The critique of language and the symbolic mode of intelligence can be found throughout Bergson's work.
56. Bergson, *Time and Free Will*, 78; 53.
57. Ibid., 125; 83.
58. Ibid., 101; 68.
59. Deleuze, *Bergsonism*, 42; 36. See Bergson, *Time and Free Will*, 121; 81.
60. Bergson, *Matter and Memory*, 69; 216.
61. Bergson, *Time and Free Will*, 105; 70.
62. Ansell Pearson, *Philosophy and the Adventure of the Virtual*, 23. In chapter 2, we saw how in *Matter and Memory* Bergson describes perception and consciousness not in terms of imposing forms on inert matter but, instead, as immanent to matter (or images) in formation. Matter itself moves and endures. "Hence," according to Deleuze, "the importance of *Matter and Memory*: Movement is attributed to things themselves so that material things partake directly of duration, and thereby form a limit case of duration. *The immediate data (les données immédiates)* are surpassed: Movement is no less outside me than in me; and the Self itself in turn is only one case among others in duration." Deleuze, *Bergsonism*, 75; 73.
63. Bergson, *Creative Evolution*, 39; 528.
64. Deleuze, *Bergsonism*, 38-40; 31-33. See also Ansell Pearson, *Philosophy and the Adventure of the Virtual*, 15-16.

65. For the following treatment, see Manuel DeLanda, *Intensive Science and Virtual Philosophy* (London: Continuum, 2002), 10-13; Morris Kline, *Mathematical Thought from Ancient to Modern Times*, vol. 3 (Oxford: Oxford University Press, 1990), 882-96.
66. See Bernhard Riemann, "Sur les hypothèses qui servent de fondement à la geometrie," in *Œuvres mathématiques*, transl. L. Laugel (Sceaux: Éditions Jacques Gabay, 1990), 282. See also Deleuze, *Bergsonism*, 39-40; 31-32.
67. Bergson, *Creative Evolution*, 302; 750.
68. The following analysis is based on Linda Dalrymple Henderson's *The Fourth Dimension and Non-Euclidean Geometry in Modern Art* (Princeton, NJ: Princeton University Press, 1983), see especially 45-116.
69. Albert Gleizes and Jean Metzinger, *Du cubisme* (Paris: Eugène Figuière, 1912), 18-19, quoted in Henderson, *The Fourth Dimension*, 94.
70. Henderson, *The Fourth Dimension*, 90.
71. Ibid., 91.
72. Umberto Boccioni, *Pittura scultura futuriste (Dinamismo plastico)* (Milan: "Poesia," 1914), 196-99, quoted in Henderson, *The Fourth Dimension*, 110-11. On the Bergsonian motivation of Boccioni's art and theory, see Brian Petrie, "Boccioni and Bergson," *The Burlington Magazine* 116 (1974): 140-47.
73. Henderson, *The Fourth Dimension*, 115.
74. Sanford Kwinter, *Architecture of Time: Toward a Theory of the Event in Modernist Culture* (Cambridge, MA: The MIT Press, 2001), 63.
75. Deleuze, *Bergsonism*, 39-40; 32-33.
76. Faure, *Fonction du cinéma*, 33-34, 60, 65.
77. See Malcolm Turvey, *Doubting Vision: Film and the Revelationist Tradition* (New York: Oxford University Press, 2008), 21-25, 49-51.
78. Jean Epstein, "The Senses 1 (b)," transl. Tom Milne, in *French Film Theory and Criticism: A History / Anthology*, vol. 1, 1907-1929, ed. Richard Abel (Princeton, NJ: Princeton University Press, 1988), 241-46, quotation on 244.
79. Malcolm Turvey, "Jean Epstein's Cinema of Immanence: The Rehabilitation of the Corporeal Eye," *October* 83 (1998): 25-50.
80. Richter, "My Experience with Movement," 142-43. See also Richter, *Filmgegner von heute - Filmfreunde von morgen*, 34-42.
81. Richter, "My Experience with Movement," 150.
82. Ibid., 142.
83. Ibid., 150.
84. See Bergson, *The Creative Mind*, 190; 1422.
85. Ibid., 128; 1365.
86. Henri Bergson, *Duration and Simultaneity: Bergson and the Einsteinian Universe*, transl. Leon Jacobson, ed. Robin Durie (Manchester: Clinamen Press, 1999), 30; original in *Durée et simultanéité*, Collection Quadrige (Paris: Presses Universitaires de France, 1998), 41.
87. Bergson, *The Creative Mind*, 109; 1347.
88. Ibid., 159-60; 1394. Intuition is "the direct vision of the mind by the mind – nothing intervening, no refraction through the prism, one of whose facets is space and another, language." Ibid., 32; 1273.
89. Ibid., 161; 1395.
90. Ibid., 34, 184; 1275, 1416.

91. Ibid., 165-66; 1399. The notion that the image would recapitulate and disclose the qualitative continua of pure memory through its rhythmic intensities was articulated by Marcel Proust during that same period. When he writes in *Time Regained* about virtual planes of memories – ones that are "real without being actual, ideal without being abstract" – Proust suggests that their emergence into consciousness occurs through "a species of optical illusion." This illusion is about fragmentary images or resurrections of the past, ones incompatible with the present, which nevertheless merge with the present situation in a "flash of lightning" and thus allow one to apprehend "a fragment of time in a pure state." (Marcel Proust, *In Search of Lost Time*, vol. 6 of *Time Regained*, transl. Andreas Mayor and Terence Kilmartin [London: Vintage, 2000], 217-27). In this instant, time seizes upon bodies and displays "its magic lantern upon them" (ibid., 291). The emergence of these images momentarily arrests the ordinary functions of the intellect and makes it possible to approach things in their essence, outside the irrevocable linear course of time. The images Proust evokes are understood as moving in the sense of recurring in time. They are dynamic images that, to quote Deleuze, generate a "new depth" that "directly forms a region of time, a region of past which is defined by *optical* aspects or elements borrowed from interacting planes. It is a set of non-localizable connections, always from one plane to another, which constitutes the region of past or the continuum of duration." Deleuze, *Cinema 2*, 108; 142.
92. Émile Vuillermoz, "Before the Screen: Hermes and Silence," in *French Film Theory and Criticism: A History / Anthology*, vol. 1, 1907-1929, ed. Richard Abel (Princeton, NJ: Princeton University Press, 1988), 155-59, quotation on 158.
93. Doane, *The Emergence of Cinematic Time*, 172-205.
94. Cubitt, *The Cinema Effect*, 71.
95. In addition to *Fantasmagorie*, the titles include *Un drame chez les Fantoches* (1908) and *Le cauchemar du Fantoche* (1908).
96. Cubitt, *The Cinema Effect*, 76.
97. Ibid., 93.

Conclusion

1. Jacques Rancière, *Film Fables*, transl. Emiliano Battista (Oxford: Berg, 2006), 175.
2. Ibid., 180.
3. For a recent take on the cinema's relation to death, see Laura Mulvey, *Death 24x a Second: Stillness and the Moving Image* (London: Reaktion Books, 2006), especially 161-80.
4. Esposito, *Bíos*, see especially 110-45.
5. Jakob von Uexküll, "An Introduction to Umwelt," transl. Gösta Brunow, *Semiotica* 134 (2001): 7.
6. See Ernst Jünger, *Der Kampf als inneres Erlebnis* in *Werke*, vol. 5, *Essays I* (Stuttgart: Ernst Klett, 1960), 67-96. On war and cinematic perception in Jünger, see Carsten Strathausen, "The Return of the Gaze: Stereoscopic Vision in Junger and Benjamin," *New German Critique* 80 (2000): 125-48.

7. Ernst Jünger, "Über den Schmerz," in *Werke*, vol. 5, *Essays I*, 187, 192-93.
8. Esposito, *Bíos*, 158.
9. Stanley Cavell, "What Photography Calls Thinking," in *Cavell on Film*, ed. William Rothman (Albany: State University of New York Press, 2005), 115-33, see especially 126-30.
10. Ibid., 126.
11. David Rodowick, *The Virtual Life of Film* (Cambridge, MA: Harvard University Press, 2007), 130.

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