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Ciphers of Hieroglyphic Time

Here again music gives the most extreme expression to certain characteristics of the artistic, though this too by no means bestows any primacy on music. Music says "We" directly, regardless of its intentions.
      —Theodor Adorno, *Aesthetic Theory*

Clocks That Don't Tell Time:
Temporal Diagrams of Personhood and
Publicity in Time-Based Media

Cinema or the digital interface: We consider these time-based expressions to be, variously, "technologies," "media," or perhaps, when thinking of these technical industrial expressions in specific historical contexts, "institutions," "discourses," "practices," or "forces." *Sync* begins from the observation that such complex exhibition installations are, very generally, something more like queer clocks: devices that diagram, express, and interpret unfamiliar temporal relations. This observation that time-registering devices, such as cinema—or telephony, phonography, radio, television, or the World Wide Web—equip us with situations for expressing and interpreting time is a weak one. It may mean that temporal, temporalizing media devices may have no more value than as devices—perhaps heterogeneous, arcane, opaque, or as yet imperfect in terms of their temporal presentation—for registering, storing, exhibiting, expressing, and exploring the passage of historical or lived contemporary time. Alternatively, such a claim may mean that queer clocks may be so powerful as to determine entirely their receivers' capacity to know and to move in time.

Think of Freder in Fritz Lang's *Metropolis* (1927). He goes in search of the elusive and entrancing Maria, but, leaving the Elysian heights of the

city-state's leisure gardens, he receives a visual shock from which he physically recoils. In a much sampled and appropriated scene, troops of laborers wrestle in a choreography of human and machine, struggling to hold on to gears resembling the hands of clocks to maintain their balance on the precarious tiers of the great "Moloch machine" and the energetic balance of the city. He sees that their efforts utterly exhaust them, but the callow son of *Metropolis*'s director has to know this corporeal exhaustion to experience it.

Young Freder relieves one of the exhausted workers and takes hold of the clock-hands-as-gears, struggling to hold the truth of the energies animating modern industrial time in his own hands. His grappling with this haptic knowledge of the force of modern temporalities is not enough: Freder spends much of the subsequent duration of the film in a fever dream, visualizing an alchemical-industrial enactment of the ultimate transgression. His patient, caring social worker, Maria, is transformed in a magical, technological experiment into a machine-woman whose choreography of erotic surface and machine movement reduces the individual perspectives of *Metropolis*'s leisured male elites to a collective mass of protoplasmic, ocular lust. Then, the erotic, robotic dancer shifts her energies to revolutionary agitation, inciting *Metropolis*'s exhausted workers to leave their posts at the gears of industrial time and to run amok, ruining the tentative historical order of the vertical city and causing catastrophe for all.

Reading *Metropolis* as a narrative entry in the modernist project of a rhythmic cinema, Michael Cowan[1] points out that the film focuses "on the central question at stake in the [period's] broader rhythm debates: namely that of the limits between technology and organic life" (236). As rhythmic cinema, Cowan explains, it dramatizes then-current debates about tensions between corporeal rhythm and machine rhythm (*takt*) but, further, clarifies tensions between Marxian and Bergsonian understandings of history and temporality. *Metropolis* prompts reception, then, of a double, temporal aspect. Its clock-machines do not "tell" time; it diagrams a relation between contemporary debates about historical transformations in labor and in contemporary cinema.

First, it mobilizes complex affective tensions that it puts to work in presenting untenable and more manageable organizations of personhood and public being. And it dramatizes personhood and publicity in relation to autonomy and governmentality. It characterizes these tensions in temporalized, energetic terms: The masculine pleasures of leisure time are suspended over the masculine toil of work time. Director Freder's televisual surveillance is ultimately powerless to constrain the energies that accumulate, and the escalating state of oppression, in which male workers are feminized as exhausted machines maintaining *Metropolis*'s heights, reaches an inflection point of technological transgression when the machines become superlibidinally human. Innocent Maria, the feminized embodiment of care, and robotic Maria, the feminized embodiment of machine time (and of cinematic spectacle as alchemical double of industrial

labor), first channelize attention to, and then disastrously incite and release the explosive forces of, industrial clock time. The disorganized energies of the revolting workers throw the vertical balance of power in the city into disarray. The film's escalation of time as chaos—revealed by wild sequences in which montages of hallucinatory labyrinthine detours to secret depths lead to frenzied pursuits back to spectacular heights—is followed by the thermodynamic exorcism of techno-magic, as robot Maria is burned at the stake, and her alchemist-inventor Rotwang falls to his death. The film closes with a horizontal chain in which Freder and his father clasp hands on the broad steps of the city cathedral. The unsustainable vertical heights of the city are leveled to more horizontal relations between worker, mediator, and owner.

Surveillance in the form of televisual information pales in comparison to the energetic forces of technologized divisions of labor and leisure, but, finally, gendered, classed divisions of labor remain intact. What *Metropolis* proposes is only a tempering and rebalancing of the rhythmic expression of energetic industrial time. *Metropolis* is a temporal diagram of complex temporal relations; it presents wildly fluctuating temporal transformations in the streams of time-based image and nonsynchronized musical accompaniment. Cinema's doubled temporality, presenting temporalized expression in time-based sequences, proposes an expression and an interpretation of the historical, material, and affective relations determining personhood and publicity, autonomy and governmentality.[2]

Lang's film exemplifies the two observations from which this study departs. *Metropolis* as cinematic exhibition may have no more value than as an arcane exhibition device presenting a heterogeneous, opaque, and imperfect temporal diagramming of history, modernity, labor, personhood, publicity, and power. It also claims, in its spectacular aspects and its narrative form, that distributed industrial ensembles, such as power networks or cinema, may be so powerful as to determine entirely their receivers' capacity to make sense of or to move in time. The informatic, networked, televisual processes of surveillance become powerless to control the larger exhaustions and eruptions of energetic relations primed in that energetic inflection point where technology becomes magic, whereby Maria becomes a spectacular, dancing agitating machine. In *Metropolis*'s temporal diagramming of material, technical, and affective labor, information power pales in comparison to energetic power. *Metropolis*'s diagramming of audience reception and historical temporality presents the biopolitical governing of personhood and publicity as still more a bioenergetic than a bioinformatic dynamic.

Metropolis is a temporal diagram of historical transformations that emerges from a particular, transforming historical moment. It tells us only something about its own period and production from the vantage point of our own. It does not represent its time but diagrams complex relations between its own moment

and the larger historical period in which it was made. The film is a clock that does not tell time but diagrams temporality, and we diagram some relation between its complex temporalities and our own in receiving it. Between the two limit points of presenting an entirely indeterminate and an entirely determining temporalized expression of time entangled within the time-determined series of cinematic images, along with the great ambivalence with regard to historical and contemporary meanings this entanglement entails, to say that technical, such presentational ensembles as cinema or the computational display are complex, queer "timepieces" more than presentations of representational or denotational images or enframed world pictures means, simply, acknowledging that such complex ensembles as cinema *may* express temporality in terms of the clock time in relation to which their disparate technical mechanisms function and to which they were viewed. Such works as *Metropolis* do not exhibit the contents of their displays as historical or as contemporary clock time in any reliable way—despite our possible identifications with young Freder's shocked gazing on the choreography of exhausted workers.

Cinema or computational interface channel and express streaming, temporalized expressive material like series of recorded images or sounds; in this sense, they are "media." Cinema or computational interface derive their capacities for time-based expression from techno-scientific processes deriving from nineteenth-century thermodynamic sciences and are motivated in materialist geopolitics. They rely on inventions produced in large-scale transformations of industrial production systems whose increasing automation over historical time is achieved in compressing and channelizing the serial production processes that they draw on and redistribute; in this sense, cinema or interface are "technologies."

But however closely we may attend to the clock faces that cinema or computational display may present, these temporalized, technical exhibitions of mediated sound and image do not represent clock time. Clock time is some temporal standardization for measuring elapsed duration on local, geopolitical, planetary, or cosmic scales. Time-based presentational ensembles, such as cinema or digital interface, cannot fully, actually, or factually represent clock time, nor can they actually represent historical or contemporary time. The materiality of the display ensures that the representation of time and our apperception of it are, however apparently precise, to some degree contingent on some larger series of time. As the saying goes (familiar, perhaps, in Orbital's sampling, looping, and remixing of it), "even a stopped clock tells the right time twice a day." Any temporalized audiovisual display presents some measured ratio of—a temporal diagramming of—complex relations between the order of historical time and contemporaneity, expressed as complex relations of personhood and publicity, autonomy and governmentality.

And the deployment of these time-based displays of temporalized expression is itself part of the large-scale reordering of geopolitical world space. Synchronized devices, whether the synchronized gear mechanisms of the synchronome, the cinema, or the synchronized semiconductor mechanisms of computing displays, relate historiality and contemporaneity, personhood and publicity in displacements of historical time and space. As complex as the queer clock faces of cinema or digital interface seem, we can carefully match critical description to particular instances, historical contexts, and interpretations to determine how technologies, media, a particular work, and their complex historical social situation and resituation of time and space become expressive in reception.

Consider, in this light, Charlie Chaplin's *Modern Times* (1936). Like *Metropolis, Modern Times* also presents a time-disciplined factory setting surveilled and controlled by television. As in *Metropolis, Modern Times*'s factory disciplines workers whose movements are stressed by their synchronization with the speed of industrial production and within a larger temporal stream whereby production is synchronized in divisions of property and labor. In both films, televisual communication surveys the "liveness" of the workers' movements and dramatizes the displaced nature of the labor animating the production of everyday life from the surface of everyday life. Famously, Chaplin's Tramp persona, appearing as "A Factory Worker," naively accepts the factory ownership's increasing demands to synchronize his every living movement with serialized machine production, helping prototype a new "feeding machine," which shovels food at him faster than he can consume it. Subsequently, a frenetic musical accompaniment punctuates the Tramp's strained efforts to keep up with the increasing speed of the assembly line. In the converse of his test run of the feeding machine, though, now he is run through, consumed by, the assembly line. As Christian Hite[3] observes, the Tramp's frenzied automatisms result in his disgorgement from the factory in a case of "indigestible" labor.

But before his choreographed path out the factory door, and as he is fed through the machine, we see a cross-section view revealing the innards of the assembly line through which he "unreels" (Figure 1.1). The Tramp is flattened like a filmstrip as he streams through the gears of the machine, reflexively diagramming the film projector apparatus that we, as audience, are watching. *Modern Times* reminds its audience of the technical labor whose intensified automation continues to displace material labor; and, more incisively than *Metropolis*'s ostensive analogy of "feminized machine" with cinema reception, it reminds audiences that cinema itself is a site where these historical displacements occur. Chaplin's familiar Tramp persona plays a large part in this revelation. Then, too, there is the loose yet incisive synchronization of rhythmic pulse and melodic tone with the Tramp's hysterical movements in the factory sequence, contrasting with the general quietude of the anxious director's office; the intertitles used

FIGURE 1.1 *Modern Times* (1936): The Tramp as factory worker consumed by the factory (frame capture). (*Modern Times,* dir. Charles Chaplin [Charles Chaplin Productions, 1936].)

throughout the film; and Chaplin's performance near the end of the film, when, before a working-class diner crowd, he sings a nonsense song whose polyglot lyrics telegraph an echo of cinema as "universal language"—all these audiovisual stagings recall formal and technical aspects of, as well as the affective aspirations of, cinema before the coming of synchronized sound.

    Modern Times uses synchronized sound, then, as needed, and while deploying the higher fidelity and mixing techniques characterizing new studio sound-production methods and technologies of the mid-1930s. But it does so in the interest of articulating its own capacity to prompt our recall of nonsynchronized (silent) cinema. By charting relative changes in volume balancing music, dialog, and sound effects during the formative years of synchronized cinema sound tracks, Rick Altman, McGraw Jones, and Sonia Tatroe argue that the Hollywood sound track resulted from specific negotiations of "social and cultural work as well as technical labor, and thus from conflicting contemporary commitments to differing sound types and uses."[4] Studio sound methods, too, exist within the changing soundscape, and, as Altman and many others have emphasized, understanding cinema sound also means understanding the everyday soundscapes exterior to cinema.[5] In fact, *Modern Times* presents similar observations and critique, although in diagrammatic rather than scholarly form. Its narrative

form models tensions in the advance of sound-film technologies, which Altman and his team track from the late 1920s to the mid-1930s.

It uses musical sound in the manner of silent cinema but also scores such scenes as the one depicting the factory director in his office without music or dialog—that is, "real" feeling or actual communication. Too, synchronization of sound and image in the factory sequence as frenetic labor evokes the noisy factory floors that such theatrical sound designers as Harold Burris-Meyer helped the Muzak corporation balance with efficiency-prompting musical sound tracks during the 1930s and 1940s and that he hoped might be deployed for cinema. And it also provides a shrill rendition of the bustling soundscapes of urban metropoles, which, as Emily Thompson[6] notes, prompted soundproofing as an architectural technique while contributing to the iconic musical motifs decorating such buildings as New York's Rockefeller Center. By emphasizing the director's suite as anxious, soundproofed quietude, *Modern Times* depicts anxious internalized stress as the counterpoint to energetic laboring excess.

The film's rendition of the affects of modern industrial labor is double. First, it synchronizes musical imagery as contemporaneity: A working frenzy becoming hysterical in the effort to keep up with the speed of industrial machines or musical quietude as Tums-popping stress, *Modern Times* evoke the soundscapes of metropole and factory using the new sound technologies of the mid-1930s to telegraph the affective tensions of contemporary life.[7] But *Modern Times* does not only propose a critique of contemporary work, consumption, and leisure with cinema projected, as the Tramp and the Gamin (Paulette Goddard) hit the road, as a momentary critical escape from more unobserved forms of these activities. The film also provides a history lesson on cinema sound by way of musical synchronization. It diagrams an *earlier* period of nonsynchronized cinema sound and image as historically immanent to the contemporary synchronized cinema. *Modern Times* does not depict contemporaneity; it does not tell time. It diagrams time, in time.

Using contemporary sound-image synchronization techniques to recapitulate expressive aspects of the earlier, nonsynchronized cinema as well as the earlier cinema's often-progressive aspirations for mass cultural expression, *Modern Times* musically prompts, while reflexively diagramming, its audience's recall of the industrial history through which, sitting in the site of reception, it is again passing and displacing. The historical energies of nonsynchronized cinema are projected as dated but enduring: not up-to-the-moment like the feeding machine, yet still to be fully exhausted, still historically resonant. The set piece of the factory scene, with its closely choreographed synchronization of shrieking music with Chaplin's herky-jerky performance and its reflexive cross-sectioning of industrial cinema as a displacement of historical labor, is also a "timepiece." This sequence prompts apperception of the passage of cinematic time as a strange and complicated historical time: a queer clock ticking away public

moments of Chaplin's familiar aging persona. *Metropolis* and *Modern Times* make clear that synchronization, in networks of ensembles that cannot tell time, is first a matter of coordinating the *contemporaneity* enframing audience reception with the *historiality* of the streaming composition. Whether the ensemble we receive refuses our interpretations and gestures or incites them, it precedes the contemporaneity in which we receive it and from which we are excluded. Complex temporal diagrams, such as cinema or the computational interface, whatever their capacity to hold or to program cultural or technical memory, begin for receivers as materialized, antimemorial ensembles of the streaming temporalities in which they are diagrammed—and that, in turn, they, too, partially diagram.

Chaplin's historical persona in *Modern Times* is prepared by Chaplin and the studio ensemble; but the synchronization of his frenetic gesture with the frenzy of factory "music" is rendered not simply by the "filmmaker," as Michel Chion[8] generally insists, but also by the audience for whom it is projected in reception. As we "hear" *Modern Times*'s "silent cinema musical sound" carrying the Tramp's commoditized serial image object through that cross-section of the assembly line/film projector, as we see and hear the results of up-to-date 1930s Hollywood sound technologies interpreting the film's time-out-of-joint expressive tactics, we travel backward down that path to an earlier period of cinema whose forward transitions Altman and his team have excavated. Though it cannot accurately represent time and space because it helps displace them, cinema begins with a synchronization of reception and production as exhibition, where historiality and contemporaneity are diagrammed via affective means that audiences feel: differentiations of personhood or publicity, autonomy or governmentality. Cinema reception—whether within the production process or in exhibition—*also* distributes the process of any cinema's own historical displacement. The disappearance of the Tramp and the Gamin is the trail of the leading edge of a never fully elaborated allegory of reception—that is, when it is not just a tentatively happy ending.

Exhibition Diagrams, Reception Diagrams

The reasons for starting from the very weak claim that "technological media," such as cinema, are more like clocks that cannot accurately tell time or register space in the site of reception and that become expressive in spite of themselves become apparent, I hope, when we consider the highly musicalized synchronization strategies of such canonical works as *Metropolis* or *Modern Times*. Classic apparatus studies, such as those of Jean-Louis Comolli,[9] demonstrated that any complex exhibition installation, such as cinema, is always a sum of more than simply the material parts constituting its earliest concrete instantiation. As Martin Jay[10] notes, the apparatus theories of Paul Narboni, Comolli, Jean-Louis Baudry, or Christian Metz may well have been a "culminating moment in the

French critique of ocularcentrism." But the aspects of Comolli's argument that stress cinema's needs to meet specific material historical conditions of perspectival imaging to become viable for viewing remain worth noting. Further, as genealogical and discursive analyses, such as those of Friedrich Kittler,[11] suggest, describing large-scale shifts in the means of knowledge production (in Kittler's *Discourse Networks,* a shift from literary, philosophical, and pedagogical networks of distributing literary epistemologies to technical, mechanical, and probabilistic networks) may be more revealing than presuming static ontologies, epistemologies, and ethics for highly socially freighted, technically sophisticated, and historically fraught conduct, such as "writing." It can never be entirely clear at any particular moment of historical time the precision with which any particular media apparatus may render its meanings, ideologies, or effects, as cultural studies of time-based media from Walter Benjamin onward have long observed.

But, as Benjamin's writing on language and on cinema also make clear, that aspect of the contemporary we may experience as glassine sphere of everyday life rolling forward from a continuous, retrospectively accessible historical past that we need only turn around and view before equipping ourselves to wheel on forward may, with closer consideration, appear as cracked surface. Perhaps it is patched together as much by the effect of historical eventuality or of some form of spoken or unspoken consensus—or by some ensemble of scientist, artist, historian, or critic. Perhaps it is simply some willful desiring cognitive agent who, diagramming time in time, conveys discovery, insight, recollection, elaboration, even tentative conclusions as to the meanings of profound displacement, disruption, or destruction. A willful, desiring cognitive agent does not need to mean "an individual person."

Metropolis and *Modern Times* today demonstrate that whatever the shortcomings of the works or the ensembles of people who made, exhibited, and received them, cinematic works also diagram cracks and patches, relate historical time to contemporary time, in being projected. When the interpretation of recorded, distributed, and exhibited data depends on synchronizing the operations of an intervening technical device with those of the archival medium in which the message is encoded, any "social" meaning may, in fact, be written as "noise," as Kittler argues, rather than as historical "signal." Yet history finds ways of biding its time while the gears or discs of our technological sense and sensation synchronize in action or strain and fall apart. Even in spite of the material conditions they may impose or withdraw, and as Theodor Adorno argues for music, cinema or computing displays say "we." But contrary to Adorno's insistence, they say "we" indirectly: They ultimately diagram historiality and contemporaneity in only expressive terms, however abstract, of personhood and publicity. If *Metropolis* hedges its social observations about material labor and creative labor by diagramming their spectacular inflection as choreographed, gendered, gestural movement, *Modern Times* diagrams its own filmic history as

the value retained by musical synchronization of sound and image in a transformed regime of studio production practices.

As clocks that don't tell time but diagram temporality, these films raise the key questions that *Sync* attempts to answer: why and how musicality and gesture have been so frequently, consistently, and broadly deployed for emphasizing the synchronization not simply of sound and image streams but of historical and contemporized time, in streaming media undergoing radical transformations in their technological materialities, in their medium specificities, in their formal variations, and in their reuse. My own textual diagrams describing highly compressed interpretations of *Metropolis* or *Modern Times,* above, begin to offer evidence of this problem and an initial attempt at the answers. Films such as these do not propose their visual imagery only as concepts or necessarily as logical propositional images presenting literal space, movement, or motion in historical or in contemporary terms. Rather, such works propose complex temporal relations as complex temporal diagrams. Still, as we can already see, weak claims grant great plasticity. We need to attach a bit more ballast to the ballooning elasticity becoming apparent in my temporal diagrams if they are to be at all critically descriptive.

Recent scholarship provides wide precedents for reading streaming media as diagrammatic or emblematic presentation. As Charles Altieri[12] notes, although Gilles Deleuze is appreciated as one of the twentieth century's most sophisticated thinkers on affect, his long initial engagement with Bergsonism from the late 1940s into the mid-1960s increasingly engaged with diagrammatic semiotics after that point. Felix Guattari's notes on their work together during the 1970s make clear the debt the two collaborators owed to Charles Sanders Pierce's mid-nineteenth-century understanding of diagram as "icon of relation."[13] Pierce's notion of diagram as icon of relation allowed Deleuze and Guattari to advance a still significant if expansive solution of the tensions between the historical tendencies of organicism and mechanism that had taken on urgent, critical import with the elaboration of cybernetic semiotics for network computing between 1950 and 1970. In the context of the growing sophistication and wide proliferation of global computing networks and media networks, and with no indication of an abatement in the pace at which the automation of symbolic processes proceeded yet no clear evidence of the ability of cybernetics to fully account for thought, memory, or feeling, Deleuze and Guattari pronounce the machine a "subject" and derive from Pierce's semiotics of the diagram a generative theory of nature, history, and capital that they articulate in terms of serial, symbolic-material "machines."[14]

More recently, in ways closer to more conventional phenomenologies of vision and language and more willing to engage rhetorical interpretations of cinema as well as audience commentary on computer-generated imagery (CGI) reception, Vivian Sobchack[15] considers CGI in narrative industrial cinema as

diagrammatic. Sobchack follows Peter Wollen's 1972 derivation of Pierce's theory of the sign for cinema semiotics. Wollen points out that in Pierce's semiotics, a diagram is not precisely an image but a sign presenting relations between parts of two referents; the diagram tends toward "emblematics" in a larger historical tension between the emblem and the photograph. Describing the computer-graphics animation in *Final Fantasy: The Spirits Within* (2001), Sobchack suggests that this fully CGI-animated film's promise of convincing photorealism invites audiences to read the computer-generated images as photorealistic images and as diagrammatic emblems as they compare CGI animation to the historical dominant of photorealism. Sobchack argues that the result of audiences reading CGI as a diagram of its own similitude to the photorealistic image toward which it strives is that they find *Final Fantasy*'s attempt at CGI photorealism too detailed but also lacking in its "illusion of life."[16]

Sobchack's cinema-receiver scans for tensions between image and diagram in reception but also for contemporary rhetorics and ideologies around recent computer-generated animation and performs a historical comparison of contemporary CGI realism to historical photorealism. While Sobchack argues that CGI presents a diagrammatic emblem of the photorealistic image it strives to present, her discussion also suggests that receivers also project temporal diagrams. As the cinema-CGI audience reads the time of exhibition and relates exhibitionary time to the historical dominance of photographic realism and the advent of CGI realism, more than assigning a (negative or positive) value to the realism of industrial feature-length CGI cinema, the audience is *also* relating two complex material and temporal durations. It is diagramming its reception of cinematic time to the historical transition between the introduction of computer-graphics animation and its uses. *Final Fantasy* prompts this diagramming on the part of its audience in its production, in its advance advertising, or in the ideological rhetorics circulating around both.

Despite the fact that the great majority of audience members are not likely to assign precise historical calendar dates delimiting either of these durations as specific periods in calendar and clock time, still, if audiences are weighing CGI animation with regard to the antinomies of image and emblem, as photorealistic image and as emblematic diagram, then audiences are also diagramming two portions of streaming time to one another. We create a ratio of lived contemporary time to the historical emergence of computer graphics, and we thus grant a particular type of *historicity* to *Final Fantasy*'s exhibition: its "historic" nature. The film is trivially historic, Sobchack finds, a matter of actual exhibition not living up to ideological promise or rhetorical premise. Perhaps, for others, it is significantly historic, diagrammed, say, as an entry in a series of photorealistic CGI feature films integrating the epistemologies of navigable CGI computer gaming of the 1990s with feature-length cinema animation and Web-based social marketing and fan production whose material, technical, and affective

values are yet to solidify completely. More than simply evaluating CGI's photo-realism or its perceptual realism,[17] then, audiences also diagram contemporary and historical time. Temporal diagramming proposed in the streaming work and differently conducted by audiences is not exclusive to works expressing recent media transitions or technical deployments. *Modern Times* mobilized this capacity on the part of audiences by designing the reception of its narrative form as a temporal diagramming of synchronized sound cinema's historical derivation from nonsynchronous cinema.

In just this way, though, we should consider temporal diagrams more as doubled proposals, as doubled projection, rather than as logical propositions or concepts. They orient us toward streaming media in the streaming history that they in part displace. And because the considered duration of the contemporary or the historical temporality such diagramming relates may be adequate, confused, wrong, or entirely false, temporal diagrams evaluate commensurate or incommensurate expressions of time. We may believe we experienced an event at a moment impossible for us to have done so, or we may assign the historiality of computer graphics to, say, that of computer games—so the ratio we diagram for contemporaneity and historiality may be partial, negative, or even a compounding of the negative. Temporal diagrams may be a kind of shorthand held for time we have never experienced or grasped or for time that has never passed.

Such diagramming may help us adjust habits or adapt new ones. But temporal diagramming always risks *some* commensuration of lived historical experience with a diagrammatic measure of times never personally lived and or not yet having had historical passage other than in some medial reception (fantasy, fiction, dream, speculation, and so forth). Remote, irrelevant, forgotten, lost, fictive, fantastic time, nonevents, or nondurations belonging either to a sense of historical order *or* to our reception of some sensation of it may be recollected as emblems of contemporaneity that has passed, is being lived, or is impending. The historicity we grant within partial or negative temporal diagramming may describe, replace, or destroy the historicity of the lived moment. A replacement or destruction of lived time by what we may call "mediatic" time, of course, is the threat that apparatus theories attempted to frame as a matter of political, ideological determination. They are also the tendency Kittler less dramatically describes as the discursive noise of technical networks historically replacing prior networks of written literacy. In their negative forms, temporal diagramming may amount to absolute, passive human dependency and subjection (the human as machine) on one hand or the dissolution of history as entropic fragmentation recouped in the automatisms of new technologies (the machine as history) on the other. Addiction and noise, in their negative cases, are the two limit points of incommensurate or noncommensurate synchronization. Time becomes hieroglyphic.

Echoes of Eisenstein

Barbara Stafford's[18] reading of a range of art-historical works as "echoic objects" goes some way toward helping explicate the difficulties involved with the understanding of temporal diagrams as complex synchronization I offer here. Stafford's goal is to guide the arts and humanities and the cognitive neurosciences into more productive interactions with one another. Stafford observes that, first, in borrowing historically from the arts and humanities, cognitive neurosciences may be overestimating many of their discursive claims and, second, that neuroscience cannot fully account for the cultural and historical dimensions of that cognitive work that artistic images do or the problems such images continue to raise in the present. "As both filtering and immersive new media are demonstrating, we are far from reaching the end point of the long tradition in Western philosophy of identity as *autarkeia*—that is, the withdrawal or maximal independence of the subject from all external factors as the highest goal" (211), despite many neural researchers' claims to this effect. She acknowledges the "neural Darwinism" of such cognitive researchers as Gerald Edelman, who suggests selective pressures cause changes in "populations of synapses" throughout the brain, resulting in transformed mental capacities over time. Contemporary cognitive neuroscience, Stafford thinks, suggests that the "invasive and metamorphosing 'phatic' products of visual culture might, in turn, reenter our brain strengthened":

> Such augmented images would then reconfigure the neural-synaptic organization of the brain before getting distributed in the outside world again. Explicit advertisements, shock waves of video, salient film clips, "mashed" digital media, the polymorphous World Wide Web, all design the neurons and the neural networks re-design popular culture. . . . Apparently vast populations of neurons must become synchronized at around a 40 hertz frequency of electrical pulses for conscious activity to occur. Similarly, at the macro level, for unrelated people to form coherent social groups, their divergent behavior must somehow also become synchronized. (211–212)

Synchronization at the social level depends on acquiring "social skills." Cooperation between people and environment happens, then, in macro- and microscale networked synchronization, but between neural or social synchronization, historical cultures fill the material, symbolic gaps, building complex ensembles and associations in mimetic, "compound images" affording empathy between self and other. The "work of the senses" goes beyond vision; it is affective, configurative, and performative. "Compound images" are not simply visual but "are the medium or interface where world and subject get co-constructed, that is, echoically presented to one another's view" (211–212).

If mechanistic synchronization determines neural patterning, Stafford observes, understanding patterns of attention to the images we create is all the more crucial (216). The "compound images," "inlay art," or "emblazoned interfaces" that Stafford explores encompass, then, the antinomies of realist image and emblem interpreted by Sobchack's viewer. If cognitive scientists must embrace the cognitive work such compound "inlay images" or "echo objects" do, then humanists too will have to accept a cognitive grammar of perception, those "pathos-laden *schema*" that over the course of human history have "unified self-consciousness, consciousness of one's body, and environmental consciousness into a formal logic. Visual 'universals' or visual formulas capture how we synoptically structure neural content" (209).

Heraldic devices, blazons, mosaics: These and more work as "inlay, mesh, net, lattice, or grid" (136), devices of fitness assisting in the narrative construction of the self, and demonstrate the ways thought interpenetrates the "components" of sensation and how the elements of sensation enter into thought. Familiarity with the world will not suffice: "The problem inlaying art formats specifically illuminate is interaction or the cognitive work of conscious crafting" (215). Echoic objects afford interaction between universal biological grammar and living thinking bodies making sense out of the sensations of a changing, historical world. Echoic objects are diagrams in the sense that Pierce, Wollen, or Sobchack describe: They relate portions of larger referents. But their "echoic" nature indicates that they are also reflexive, temporal diagrams.

Such echoic objects relate some portion of the synchronizing sequences of temporal patterning in mechanistic neural activity with partial sequences of social networks. *What* they relate by compounding affective empathy and mimetic construction is "pathos." Echoic objects are temporal diagrams that hold, distribute, and differentiate pathos otherwise out of reach of the synchronized processes of biological neural networks or social networks. Yet Stafford's description flattens specific historical geopolities or historical epochs, while making technological deployments or media transitions appear as aftereffects of neuro-cognitive aesthetic interaction recoverable as echo objects mediating the overlapping projects of neurological and aesthetic research.

Demonstrating the value of historical art for contemporary neuro-cognitivism, echoic objects are Stafford's resolution to the great historical tensions of organicism and mechanism that Deleuze and Guattari resolve by pushing the meaning of "machine" away from that of functional, nonliving energetic systems of instruments. Instrument, technology, or medium ceases to retain specificity in Deleuze and Guattari's treatment of "social machines," dynamic and complex ensembles animated in historical immanence and manifesting in and across historical time as enfleshed material-symbolic sense and sensation. In Stafford's work, where synchronized informatic mechanisms now clearly determine the development and processes of organic neural material,

sense and sensation are mediated in echo objects: "The dialogical motion of mimesis enabling shared affective, experience suggests that learning, affective control, and the capacity to distinguish self from others is echoic. As social beings, we seem to bounce off one another" (76).

Chaplin's film comedy and Sergei M. Eisenstein's *Battleship Potemkin* (1925) help Stafford illustrate how echoic objects mediate sense and sensation in cinematic mimesis, where pathos is effected as a synchrony of cognition resulting as a network effect coordinating viewers' responses. *Potemkin*'s Odessa Steps sequence, Stafford suggests, succeeds in presenting a unified and realistic orienting view for the mass audience by animating facets within the streaming spatiotemporal flow of the sequence. Editing modulates continuity and rupture by ordering in-frame composition against cross-frame cuts, emphasizing salient "facets" within Eisenstein's "conspicuous modernist geometry" (84). Stafford does not describe the larger network effects initializing, activating, distributing, culminating, and subsiding as historical pathos in this sequence, as if the crowd were a flock of gentle doves hunted by a ruthless military machine: sudden alarm; initial shock; mass flight; a cascade of brutality; enervation of the tragic process; and after all of these events are presented by virtue of complex rhythmic modulations, the final exhortation to remember Tsarist violence in the name of the revolution—*and* this last, not only in a final title but also in the often-noted hand-tinted red flag borne by the battleship at the film's finale. Stafford speaks of montage as echoic schemata apparent in one rhythmic swing of pathos within the larger seriation of historical pathos that Eisenstein designed the Steps sequence to telegraph. Stafford notes the cut: from a longer view of soldiers marching diagonally down the stairs cutting down the madly fleeing mass to a close-up of a defenseless sick boy fallen among the chaos. This cut, Stafford notes, produces a "nonnarrative diagrammatic starkness" (84) communicating pathos beyond metaphor by animating salient detail amid general flow.[19] In contrast, Chaplin, she observes, achieved comedic diagrammatic mimesis by making his own actions salient within more continuous cinematic duration (84). Narrative is cognitive work rather than a matter of aesthetic or cinematic form.

Eisenstein's own argument about *Potemkin* is not entirely dissimilar to Stafford's account of echoic objects but diverges in important ways. Eisenstein, too, appropriates all manner of art-historical resources in his arguments for that "organic unity" achieved by Soviet montage cinema in such films as *Potemkin*. But he contrasts U.S. or German cinemas with Soviet montage as a matter of their historical development of aesthetic resources and of the temporal diagramming of pathos. Soviet montage improved on the tempo characterizing D. W. Griffith's films by mobilizing metaphor beyond visual or narrative representation in a "*relentlessly* affective rhythm."[20] Rhythmic series trace the line of a successful film's "organic" pulse through a play of the "inner contradictions" the work exhibits. This streaming pulse is never reducible to object or objectivity.

Where Stafford's echoic object engages a dialogical crafting of interaction between neural microsynchronization and social macrosynchronization allowing the narrative constitution of self and other, in Eisenstein's work, montage projects a "microcosm" (235) bearing inner contradictions rather than an object.

For Eisenstein, rhythmically diagramming historical pathos in montage art results not simply from technological advance, as Stafford seems to agree, but also in terms of historical, social, political, and art-historical differentiation that Eisenstein believes montage expressed but that Stafford sees as independent of the dialogical echoic object. Eisenstein's essay on "Synchronization of Senses"[21] helps make the point. Here, typically, Eisenstein cites sources as disparate as Karl von Eckartshausen's account of inventing a color organ influenced by Père Castel,[22] recent writing on jazz as "disunion," or German romantic author and philosopher Novalis, Hermann von Helmholtz, and Arthur Rimbaud (and again, in the essay "Color and Meaning," Walt Whitman or Havelock Ellis in the development of what we may call a bioenergetic notion of color sensation and sense). For Eisenstein, synchronization of the senses in cinema means creating terms of correspondence using such materials as temporal rhythm or color, so as to afford a rhythmical "fusion" between the streams of phenomena projected. A successful qualitative "fusion" has nothing to do with fusing, say, "yellow" and a particular sound but is a dynamic effect discovered in the *compositional* process. The work cannot be taken apart from the compositional labor that produces it; but at its best, "fusion" arising in the composition of rhythmic streams results in a diagram that literally "reproduces" historical sense and association: "the very *image of an epoch and the image of the reasoning process* of those who are linked to the epoch" (100). This linkage becomes concrete in reception but arises from the various phases of compositional labor.

Such a projection of an epochal image via a link to those who lived its history relates to the contemporary audience *some* measure of historical time in that qualitative fusion. This diagram of a link to remote historical contradictions (rather than conditions or objects) also models the expressive internal contradictions of the present in the dynamic microcosm of montage, as well. Montage expands in reception into a microcosm relating two historical, sociopolitical streams in some measure of their contradictions. For Eisenstein, of course, this measure itself is temporal, and it must move forward as a historical development. The temporal diagram must be a positive commensuration not simply of the mass reception of mass art but the collectivized, socialist production and reception of mass art. Temporal diagramming as rhythmic stylization takes the measure, finally, of an ethical streaming of cinema exhibition.

The montage stream is not simply a dialectical object as opposed to a dialogical one. The specific art-historical dynamism of montage's double modeling of dynamic internal contradictions results from Eisenstein's own production context: his "worldview both monistic and dialectic."[23] The streaming nature of

the montage sequence projects the phases of the cinematic work's production; it expands the flat notational series of planning documents, serial images, musical accompaniment or optical sound, and technical exhibition in reception. Streaming forth, it bears with it complex potentialities: It is plastic and affective, a living cell but also historical rupture. The "harmonic recurrence" Eisenstein describes (241) as defining montage, and lacking in Griffith's work, stylizes cinema in resounding "harmonic series": that is, temporalized streams, not objects.[24] The macrocosm would be the historical stream, the microcosm of montage linking to history by virtue of accomplishing a leap in the present. For monistic immanence to prepare and to animate dialectical contradiction and synthesis, pathos must be composed in production, projected in exhibition, and then made concrete, by audiences, in reception. Cinema composition and reception are the sites where that monad as cell breaks open and expands in series. It changes history—if not socialist history, at least art history.

This rhythmic and haptic expansion that montage effects in reception *is,* further, a matter of historical specificity and of metaphor and narrative passing beyond representational limits. To extend cinema's plastic capacities for meaning beyond representation, through metaphor, as affective rhythm expressing historical pathos took time; cinema had to develop from modeling eye and vision to becoming capable of presenting "the image of an embodied viewpoint" (233). The haptic embodiment of perspective is double: "Organic unity" of montage unifies production workers and audience in complex synchronization—of reason, affect, and history—arising in diagrammatic, rhythmic gesture.

Montage as streaming, temporal diagram, then, performs the configurative and cognitive work Stafford ascribes to echoic objects in the present but further makes complex historical claims. This work is achieved in a rhythmic, pathic act rather than through nonnarrative presentation of cognitive objects. In other words, Eisenstein conceived of the historical contingency also unfurling through the montage stream (allowing such critics as Stafford or myself to isolate a cut or a montage sequence) as having been historically necessary. Eisenstein's description of *Potemkin* makes greater claims for cinema as monistic, dialectic diagramming than those Stafford makes for dialogical echoic objects. Such films as *Potemkin* achieve a (socialist) synchrony of production, exhibition, and reception streams, differentiating the expressive power of montage from the metaphoric poverty and less-developed temporal relations Eisenstein observed in Griffith—and from Griffith's casual racism (234).

Stafford resolves the historical tensions between mechanism and organicism by observing autonomic neuronal and social synchronization mechanisms mediated in an echoic organic crafting of aesthetic experience. Thus, Stafford isolates a single cut from Eisenstein's Odessa Steps sequence from its narrative. But montage becomes nonnarrative, because narrative now exists in cognition, not in the material object of the film or the material stream of temporalities

the film conducts. For Eisenstein, historical tensions between mechanicism and organicism, cognition and aesthetic form are less important than an elaboration of monistic and dialectical materialisms. His shift away from more conventional concerns of human-as-machine is not surprising, since, as I discuss in Chapter 2, in postrevolutionary Soviet Russia it was the capitalist state "machine" that had been seen as synchronizing sovereign power and social, technological, and political underdevelopment. Machine extension was not a symptom of social decay but a problem to be overcome through industrial, political, and cultural labor. Narrative was a quality of the *work* of art, its history, and its reception: Narrative or metaphor could be transmuted into rhythm or gesture in exhibition only with a doubling of the meanings of pathos—pathos in art's composition and in its material, historical, and political reception.

What is important, though, is Eisenstein's doubling of pathos as rhythmic energetic potentials: pathos immanent to privileged instances of art appropriated from the historical past (Charles Dickens, Whitman, Griffith, and so many more) *and* to the immanent historiality of the postrevolutionary present. Pathos connotes the material, aesthetic historicity of Soviet montage—its artistic achievement—but also a historicity that we associate with "liveness" in contemporary critical terms. In philosophical terms, what expands the flattened cinematic series into the organic unity of its embodied viewpoint is the streaming of rhythmic gesture informed by Marxian understandings of historical, dialectical potential and Bergsonian understandings of potential as virtuality.[25] The montage of historical and contemporary pathos takes the ratio of a complex temporal diagramming of sociopolitical and aesthetic experience. More than echoic object, its rhythmic pulse elaborates a line, the musicality of lyricism or phrasing, to trace doubled potential. Montage *scores* the moving image as complex musical diagram deciphering the hieroglyphic of modern contemporaneity as the becoming historical of Soviet art. Relating compositional labor and creative, interpretive labor to historical temporality, pathos expressing "affective logic" (250) or "sensual thought" (251) in Eisenstein is an expression of what has been recently described as "affective labor."[26]

An important point of Stafford's argument is that if the synchronization of contemporary sociality may be determined in a blast of "polymorphous" digital media forms evolving our neuronal connections collectively and autonomously while feeding through social forms and practices, then how and what we attend to as we craft our interactions with one another and the world around us are crucial. Yet even while neural cognition defines the limits of human cognition and affect, neither neuroscience nor echoic objects respond to any need for a critical history of neuroscience, as Stafford allows when deferring from pursuing biopolitical considerations. Nor do we learn of the pathos of intimate or grand historical failures of artistic, neural, or social synchronization not evident or recoverable in the cognitive-affective emblematics of echoic objects. We are left

wondering how "salience" and "attention" might be expanded to Eisenstein's "devastating rhythm."

In Eisenstein, stylizing cinema as devastating rhythm claims the most advanced capacities of cinema to conduct historical pathos in the memorialization of traumatic violence. Too, if temporal diagrams may reproduce affect as commensurate, incommensurate, or noncommensurate relation between contemporaneity and historiality, Eisenstein's consideration of montage as having a doubled potential for such ends suggests pathos as commensurate and noncommensurate relation. It can only be affective labor as an expression of synchronizing composition and reception that reproduces historical pathos as pathic act. In Eisenstein, affective labor expresses the fluctuating capacities of the temporal diagram in a medial ethics, as if to say, "This is what aesthetics can do; this is what we can do; this is what history can do." Temporal diagramming does not tell time; it risks wild, even destructive relations. But it expresses the ethical capacities of the medium in affective labor. Yet why echoic objects or rhythmic pathos? Why should a medial ethics arise in rhythmic, musicalized temporality rather than a literal description or representation of world space?

Echoes, of course, present displacements of space and spatial objects: Think of sonar. Stafford's echoic objects present an ethical hinge between aesthetics and science trading echoes in a shared world or interdisciplinary space. Rhythmic line, though, has to do with continuous, streaming displacement of temporal streams. Indeed, whether in early nonsynchronized or synchronized cinemas, exhibition prompted observations of the cinematic exhibition's unreeling of the serial image in terms of time as musical diagram—as various of Eisenstein's writings attest. I have noted[27] the broader significance of French critic Emile Vuillermoz's comments that the nonsynchronized cinema might "orchestrate our images, *score* our visions and memories according to a strictly musical process."[28] Musicality seemed to *score* the cinematic image and diagram it in time, a more dynamic version of the way that Sobchack describes computer graphics as diagramming their own photorealistic image. Thinking about cinema as musical scoring of the serial image allowed such critics as Vuillermoz to attribute specific historical capacities to the emergent mass art: what it could do—that is, its ethical capacities.

Musicality, as the term is used in this study, comprises those effects of music as they may be performed or represented in other than auditory media: performances that may only mime or otherwise do not produce audible music, or qualities specific to music presented in visual terms. Musicality may inform visual lyricism in the mediated work even as it invites performative actions by audiences in response: foot tapping, head nodding, hand clapping, or even simply breathing. Musicality is what Eisenstein attempts to exploit in his plans for isomorphic movements between visual and sonic domains. It is what Eisler aims to enrich by means of a film music counterpointing the filmic image. It is this

same musicality in which Berkeley immerses the audience of the classical Hollywood musical with kaleidoscopic visual patterns set to music; that music video uses to advertise the body of the pop star; that television jingles implement to enhance the appeal of cars, cigarettes, or hygiene products; and from which film and television narratives draw to clarify for viewers what are often ambiguously sequenced image fragments.

Musicality synchronizes medial or narrative form with audience knowledges and practices to create emergent meaning out of the conflict between what is given to us, what we demand, and how we respond. In this conflict of narrativity and enunciation, music begs the investigation of materials synchronized as instrumental mediation: the ways in which the noise of a representational apparatus is transformed into an instrument. Attending to musicality in these terms requires a radical decoupling of musical meaning so that aesthetic effect is no longer strictly tied to material form, visual or auditory perception, or mode of reception. *Sync* aims to address this need for a transmedia, transcritical, *and* affective description of musicality emergent within synchronized streams of time-based media. At the same time, *Sync* responds to the historiographical concerns raised by new media claims of digital transcodability of all prior forms.[29] As the following chapters show, musical meaning in time-based media today extends explicitly to the indexical gesturality of interactive digital media, so it should not be surprising that, historically speaking, musicality and gesturality provided key registers for prototyping the heterogeneous futures of media out of which digital cultural forms have arisen.

Transposing Diagrams for Affective Labor

During the 1940s, preparations for the industrial deployment of television also prompted musical proposals for television broadcast. Much early U.S. commercial television, indeed, was first programmed by such industrial behemoths as CBS, according to models informed by studies of programmed radio listening, such as those Paul Lazarsfeld carried out at Princeton and Columbia. But more speculative proposals suggested that the television image might be broadcast most effectively as a musical synchronization of studio production ensemble with domestic viewing audience—whether the televisual broadcast communicated news or music and whether it featured live action drama, more abstract imagery, or musical performance.

In a 1946 *Hollywood Quarterly* essay, Carl Beier[30] brainstorms television broadcast as something like a streaming version of Stafford's echoic object, a musical synchronization of the gamut of film-studio techniques—including mise-en-scène, *mise-en-cadre,* visual montage, sound performance, mixing and dubbing—and even suggests hypothetical, live electronic compositing. The references in Beier's article are so lively as to make television an unintentional

musical pastiche of the "seven arts":[31] cinema; the framed sprawl of action in a Breughel painting; the Living Newspaper theater experiments (where Joseph Losey gained initial fame); Orson Welles's production of *Julius Caesar*; sound cartoons; techniques proper to the vast archive of cultural expression, properly prepared, may be presented unrehearsed along the lines of improvised jazz, "less of an orchestral performance than of a jam session" (5). This mélange of studio production, broadcast network, and domestic reception might become an ensemble of dynamic, musical process:

> Since this televisual "orchestra" is not sufficient unto itself, the director's position during a performance is comparable to that of the conductor in the pit at a musical play. . . . The pace and flow laboriously achieved in the shooting of a motion picture, and in the cutting rooms and special-effects laboratories, must be given to a television production *as it goes.* The texture and tempo of the sound that is achieved in recording, cutting, scoring, and dubbing must all be "played" in television, instead of being finally assembled as in films. All the processing of film (both sound-track and picture)—exposure, development, cutting, the addition of special photographic effects, dubbing, and projection—is compressed, in television, into the instant of electronic pickup and transmission. . . . It is not enough for the director to conceive and rehearse the actions of his performers: he must "conduct" them in performance as well.[32]

Beier's interest in what Eisenstein described as ideological-intellectual and professional-technical matters,[33] however extravagantly presented, is still crucial to the historical experience of diagramming contemporary time and historical time in terms of material, technical, and affective labor. Conceiving the TV director as an improvisational, multimedia conductor invokes jazz epistemologies while associating quality television with contemporary musical art rather than with the production of information: "Spontaneity is no substitute for skill, but art need not always be deliberate" (5). For the young Eisenstein working in theater, jazz rhythms were coordinated with other modernist influences to enliven a theatrical montage of attractions in which a "potentate-automaton" is overthrown.[34] Here, jazz epistemologies, transposed from a minor jazz cinema, allowed a speculative temporal diagramming of live television broadcast in a streaming ratio of revered historical aesthetic expressions to contemporary networked mass culture on the cusp of another industrial transition.[35]

Perhaps Beier was aware of Oskar Fischinger's visual music animation in *Allegretto* (1936), which floats the receiver through a closely synchronized but expressive creative visualization of Hollywood jazz as illuminated radio broadcast. The work of the John and James Whitney in synchronized synthetic sound

and image, like the work of Fischinger, was also discussed in *Hollywood Quarterly* during this period, along with proposals of "audivisual music" and "cineplastics" in numerous articles proposing speculative research or technical procedures for more expressive or more efficient synchronization of sound and image.[36] In any case, for his part, Beier imagines the new television studio as an improvisational, industrial combine of cinema production, radio networking, and jazz performance. Beier overestimates the technical capabilities he thought would afford synchronizing the studio ensemble with broadcast networking and with domestic reception in his vision of musical televisual conducting of improvisational performance. But, in doing so, he also raises estimations of the skills this live musical television would require of the director-conductor: the aesthetic and technical expertise of the film director, the conducting skills of an orchestra leader, and the turn-on-a-dime facility of the jam-session improviser—with access to an internal technical network worthy of *Metropolis*'s Freder. The television director would be the lead player shaping all elements of the orchestration of a massive, musically synchronized social and technical apparatus. As for program material for this apparatus, an "*Information Please* movie short is no trick to shoot, but Gjon Mili's *Jammin' the Blues* [1944] should, I think, be ranked as superior because it is brilliantly produced" (9). Beier is thinking, then, of the range from information to contemporary musical cinema. But aiming for a live conducting of television as networked cinematic improvisation allows him to sketch a speculative medial ethics: what television should be made capable of doing. This proposal invests a premium on the new director's labor. As a speculative temporal diagram, Beier outlines an ethics of material, technical, and affective labor worthy of television as history-making new medium.

Beier's reference model for the content of televisual expression as improvisational multimedia conducting is Mili's critically acclaimed jazz "soundie" (1944). The *Life* magazine photographer, known for his work with jazz musicians and time-lapse photography using electronic flash, shot the short for Warner Brothers; it features Lester Young in a synthetic cinematic jam session. Marie Bryant scats to "Sunny Side of the Street" between the slow blues that kicks off the short and the jitterbug choreographed to the ensemble jam of the title track that concludes the film. *Jammin' the Blues* dramatizes apparently spontaneous and continuous musical temporality using carefully choreographed camera work, editing, and sound mixing. It also uses optical printing to reproduce multiple exposures, duplicating saxophonist Young in a cascade of echoing repetitions across the breadth of the frame. Further, it carefully combines special-effects superimposition with precision editing so that singer Bryant first appears as a reflection in the surface of the piano, following a series in which the pianist is reflected above its keyboard and on its lid. Then, Bryant materializes out of the rippling mesh of her own reflection.[37]

Jammin' the Blues is a complex temporal diagram in its own right. Its careful compositing of jazz sound and image as personified gesture reflecting, rippling, disjoining, or even bouncing off one another in dance stresses synchronization as musical continuity rather than as Eisenstein's "devastating rhythm." Although we routinely refer to the expert synchronization of sound and image in such a composition as this as "montage," it is important to differentiate the emphasis on improvisational continuity that *Jammin'* creates synthetically. Jazz instrumental, vocal, dance, and cinematic composition are all made to flow rhythmically together, whether as a cascade of serial disruptions within the frame as Young's image doubles and quadruples across it or as the rippling mesh from which Bryant's image emerges across the cut.

Differently from Eisenstein's early use of jazz in the theater, here, jazz stages the improvisational continuity of Young's saxophone breaking the coherent spatial geometry of the framed image or, alternatively, Bryant's song staged as emerging across the breaks of serial composition. Jitterbugging, along with the camera choreographed to follow dance movements or to contrast dance against instrumental gestures, then intrudes on the space of musical performance, redefining its framed, geometric coherence so that musical swing tests and expands the camera's perspectival foci and its energetic limits. Disjuncture and conjuncture are synchronized within the sound mix to project the effect, then, of improvisation continuing in the audiovisual stream even as musical performance or visual emphasis passes between performers. *Jammin' the Blues* indicates the important role that musical innovation played in expressing and recasting historical and emergent stresses in the temporal fabric of midcentury modern life in Los Angeles. It diagrams the "meshes of the evening," relieving the "meshes of the afternoon" that Maya Deren notably diagrams as oceanic wave energies crashing on the psychic littoral of a subject whose selfhood refracted, attenuated, and tracked to the point of self-obliteration in the harsh everyday sunlight of the studio capital.

As Arthur Knight[38] points out regarding Warner's cinematic capitalization of midcentury bebop's creative innovations, "The setting never intrudes because there is none—only apparently limitless blackness or whiteness surrounding the players" (33). In fact, an *audio* setting exists, and although it frames the entire piece along with the title credits it follows, it withdraws its authority early on: An announcer's voice frames the film by explaining that it demonstrates the stylistics of a jam session often taking place "at midnight." Otherwise, the customary framing of cinematic orchestras often balanced against and anchoring song-and-dance fantasies in period musicals, such as Busby Berkeley's *The Gang's All Here* (1943), is adjusted to better characterize the musical personalities, the creative productivity and expressive power of their performances, and the similarly virtuoso dancing they excite. The spectacular staging and editing of production numbers in such film-musical fantasies as Berkeley's *Gang* are

also deferred here in favor of shifts between shots of varying range that call, carry, shift, elaborate, and punctuate the receiver's improvisation of memory, attention, and anticipation, as audiovisual stream moves from soloist to ensemble or between instrumentalists and dancers. *Jammin'* conducts audience reception as "hot," improvisational performance.

Jammin's temporalized forms and rhetorics emphasize synchronization not simply in terms of auditory or visual continuity, then, but in terms of jazz epistemologies; indeed, as Knight observes, they emphasize the distinct performers' musical mastery and the currency of their recognizable personas, also identifiable in their title credits (30). Knight concludes that although the film attempts to present a filmic jam session as a fusion of the jazz players' productivity with a fraught, less-expressive national, racial, and ethnic imaginary, "the categories that *Jammin' the Blues* partakes of and tries to fuse mark the complexity of the film's project, the complexity of music as a social-cultural, visual, and aural representation, and the contradictions of the United States as a 'community' in the mid-1940s" (47). The film "simultaneously" emphasizes the creativity and humanity of black musicians, desiring to achieve "colorblindness" but also to be racially mixed, all at a moment "when the impulse behind such simultaneity was not yet widely acceptable" (47).

However, the synthesis of hot performance distinguishing this film from that of the film musical, and the aspect that Beier seems to have in mind, is less that of a national communitarian simultaneity and more a through-composed audiovisual continuity inflecting a distributed, networked musical temporality fusing innovative, local media production with circulating musical knowledges. This complex continuity *is* achieved in the choreography of sound and image streams in the cinematic rendering of musical performance, not as failing national imaginary but of radio broadcasts and local dance spots. *Jammin'* does not, in fact, attempt to present a jam session as if it were a live session. For example, we never see any technical equipment, such as that typically apparent in live performance, and the sound mix is typical of 1940s radio: Even when Bryant sings from the background, we neither see a microphone nor hear a shift in volume. As the announcer's voice-over makes clear, the film presents a jam session that usually would take place at midnight—a cinematic *demonstration* of the affective labor associated with radio broadcast or with jazz dance spots, not simply an imaginary presentation of a live jam session.[39]

As the camera tracks dancers whose movements nudge the frame along to make room for their movements, the image emphasizes cinema's accommodation of radio broadcasting while making adjustments for localized performance and production. Audiovisual synchronization as "jammin'" musical continuity animates jazz photography to visualize music heard somewhere between radio-network sound and such jazz spots as those of south Los Angeles on Central Avenue. Bryant appears as a credited singer in *Jammin'*, but Central Avenue

musicians such as Clora Bryant (no relation) remember Bryant from the Central Avenue scene as a talented choreographer who produced routines for Betty Grable and Marilyn Monroe.[40]

Knight's conclusion that the film presents a model for a U.S. jazz cinema that would go unfulfilled during its own period indicates that *Jammin' the Blues* could hardly model the audiovisual representation of race, race mixing, and colorblindness as a mediation of a sovereign national imaginary. Viewing the film as a complex series whose parts incorporate musicalized disjuncture and conjuncture to communicate improvisation as continuity distinct from other modes of cinematic continuity, we can see that it synchronizes sound and image in a meshing of affective knowledges associated with radio broadcast and contemporary popular dance. The Central Avenue music and dance scene supported undervalued, behind-the-scenes studio contractors, such as singer-dancer Bryant, and prompted Hollywood residents to travel south of Pico Boulevard to segregated South Central, contributing to official concern about race mixing that was expressed through increased policing of Central Avenue's "sidewalk university." That increased policing helped cement Central Avenue jazz's demise in the 1950s, as musicians' unions integrated and segregationist housing policies were struck down.[41] In this context, *Jammin'* attempts less to imagine a national imaginary than to animate cinema as a "radiophonic" locale where national jazz stars play with local stars to demonstrate a jam session as if in a Hollywood studio appearance. It dramatizes, in other words, a boundary breaking *localization* of network dissemination. This network dissemination of musical meaning in the continuous productivity of *Jammin'*'s gestural scenics, then, is transposed in Beier's proposal for conducting improvisational television.

The stylization of a cinematic jam session in *Jammin'* derives from its entangling of two historical sources. First, as Paul Gilroy[42] observes, "Dislocated from their original conditions of existence, the sound tracks of the African American cultural broadcast fed a new metaphysics of blackness elaborated and enacted in Europe and elsewhere within the underground, alternative, public spaces constituted around an expressive culture that was dominated by music" (83). Twentieth-century black music distributed in rhizomic form (including tours, local musical productions, print, and media recordings) cultivated four antifoundational antiessentializing epistemologies communicated in musical kinesics: the political language of citizenship, justice, and equality; commentary on work's relation to leisure and the respective freedoms associated with these opposing worlds; a folk historicism reclaiming historical experience through music; and the representation of sexuality and gender identity, particularly in antagonistic relationships between black women and men, inviting identification across color lines. The tensions between instrumental performance and dance movements in the film amply translate tensions between working and leisure freedoms; between the management of race mixing in the film and the political

languages of citizenship; between masculine instrumental mastery and Bryant's vocal mastery as gendered antagonisms; and between the construction of the film itself as a historic surfacing of talent, innovation, technical mastery, and contemporaneity modeled on jazz itself as a changing folk historiality.

The second historical resource I have already mentioned: that of the visual-music cinema, which, in contrast to montage cutting, emphasized the through continuity of the audiovisual work, whether consisting of profilmic materials or graphical materials. Just as Fischinger's *Allegretto* illuminates network radio in closely synchronized musical visualization, *Jammin'* presents the abbreviated radiophonic version of a midnight jam session whose broadcast is localized as dance. Beier's proposal, then, reverses this localization.

The year his *Hollywood Quarterly* article appeared, Beier, a New Yorker who had made training films for U.S. Air Force pilots during World War II, directed a CBS radio documentary on the positive uses of radioactivity in cancer treatments called *The Sunny Side of the Atom*; the next year, he directed the late-November broadcast of *Joy to the World* for the Ford Theater series for CBS television. The Princeton alumni Web site indicates the pride Beier took in having assisting blacklisted artists—the blacklisting of artists began in 1947, the year after Beier prioritized the jazz soundie *Jammin'* over the radio quiz show *Information Please* as a model for TV production in his *Hollywood Quarterly* essay.

In the transition from the war economy to the peacetime economy, amid the rising tension of what would soon become the Cold War and the revival of commercial television's long-delayed deployment, the pedagogical effects of national media production became complicit with sovereign disinformation produced to exclude skilled creative laborers whose output was considered dangerously and spontaneously expressive.[43] At this complex juncture, black affective labor modeled creative labor for a new media director who proposed conducting the televisual broadcast as quality, improvisational music: spontaneous art that does not always need to be deliberate, controlled as information. The continuity conducted in audiovisual synchronization as a skilled modulation of ecstatic form bounding beyond but then returning within energetic limits is irreducible either to the conceptual or logical information producing it. The ecstatic, skilled indeliberation of *Jammin'* also typifies the synchronized continuity of that form commonly known as visual music. As Fischinger once said of his *Motion Painting No. 1* (1947), which I discuss in more detail in Chapter 3, "The film isn't 'cut,' it is a continuity, the absolute truth, the creative truth. Any observer can verify that, and I consider myself an observer."[44]

Visual music continuity is the classical antinomy of montage cutting. Fischinger inscribed an even-tempered, affective labor of self-observation into *Motion Painting*'s spiraling textured displacements. Meanwhile, Deren and Alexander Hammid's *Meshes of the Afternoon* (1943) cuts and structures durations of sound and image patterns to capture the creative and destructive waves of

psychic energy from everyday light and shadow and to render cinematic reception as the subjective refraction of more distant waves of oceanic, quantum energies. *Meshes* appears something like an intimate optical telegraph, tipping askew the cinema's meshing of thermodynamic power and informatic inscription for its audience, casting the cinematic image as a shadow projected by the vital energies of space-time. For its part, *Jammin'* demonstrates historical black epistemologies animated by an ensemble of skilled jazz masters whose energies bound through and across or push aside the frame.

Each of these strategies pursues continuity between the site of reception and some larger temporality in an ecstatic disciplining of the doubled entangled potentialities of the technicized media stream exhibits as materialized time: immanence and information. Whether mythifying jazz performance, reusing Bach, or introducing drastic disruptions into cinematic subjectivity, these strategies deciphered the hieroglyphic of midcentury modern time to exhibit an ecstatic continuity rather than the historical pathos animated in Eisenstein's montage. Taken together, Fischinger's *Motion Painting,* Mili's *Jammin',* and Deren and Hammid's *Meshes* serve to expand the notion of visual music from a cinematic genre dedicated to illustrating musical sound toward a particular ethics of affective labor. Chapter 2 presents Fischinger's visual music animation as ecstatic stylization of cinematic temporalities and posits a historical reading of cinema and painting within Fischinger's work of this period.

Diagramming Critical Distance

Cinematic continuity is never airtight in any of these ecstatic cinematic diagrams of modern, hieroglyphic time—it is, rather, the opposite: necessitated in historical contingency. Each of these works constitutes a locally situated but widely resounding exemplar produced in 1940s Los Angeles, understood as a media capital through which a range of epistemologies circulated, especially in relationship to New York and San Francisco, as David James[45] has extensively documented. Each of these cinematic diagrams provides a distinct expressive and technical resolution to the problem Hanns Eisler and Theodor Adorno diagnose in their critique of Hollywood and Soviet cinemas: the hopeless mythification of cinematic time *as* representation of historical reality with the use of advancing technologies of synchronization whose unconsidered power of amalgamation worked to the detriment of cinematic art, musical art, and creative labor. Fischinger's, Mili's, or Deren and Hammid's films are temporal diagrams of affective labor and of ethical media composition and reception.

But Eisler develops a more specifically dialectical expression in response to concerns about the increasingly automated means of synchronization used in commercial and noncommercial cinemas (see my discussions of Eisler and Adorno's critique in *Composing for the Films* [1947] in Chapters 2 and 4).

A two-year grant from the Rockefeller Foundation running from 1940 to 1942 allowed Eisler to investigate the uses of serialist music composition in cinema's serial production processes and imagery; this funding gave Eisler *his* chance in the role of director-conductor.[46] Having worked in cinema composing from the nonsynchronized cinema of the late 1920s and through the maturing sound era of the early and mid-1930s, Eisler nonetheless had never produced a thorough conception and execution of cinema music as the final determinant of meaning in the site of reception. Instead, he had reused musical material composed for different films, illustrating a dialectical conflict, progression, and synthesis recoverable across different films.

For example, musical material Eisler composed for Joris Ivens's *New Earth* (1933) leads to the film's concluding sequence, in which its quasi-triumphal images of ocean reclamation in the Netherlands are punctuated with musical commentary—and hesitation. We hear Eisler's "Ballad of the Sackslingers," a sarcastic ode whose caustic lyrics, sung by Ernst Busch, note the glut of world-wide production being thrown away to shore up consumer prices; the song closes with a rousing demand to throw the capitalists into the sea, instead. The jaunty march tempo of "Sackslingers" is inflected throughout with slight jazz syncopation that develops into the more resounding musical agitprop lyrics of its conclusion. The song's aural and textual materials first parody economic doublespeak and then counter it with the defiant finale.

However, the same harmonic and developmental materials of the musical cues anticipating "Ballad of the Sackslingers" in *New Earth* also appear in Eisler's score for Ivens's *Komsomolsk* (*Song of Heroes*; 1932). Here, underscoring the Magnitostroy Workers Recruitment sequence, where jobless laborers are interviewed and given positions building the giant Magnitostroy plant, Eisler's cue segues into a workers' chorus incorporating folk music and then factory sirens. Musical material Eisler scored for *Komsomolsk* as the synthesis of dialectical conflict appears as prefatory to a coming conflict in *New Earth*. Musical synchronization performed distinct stages of a dialectical progression. Still, by the time of his residence in the United States, Eisler had little faith left in any further potential for the Soviet model he had celebrated in *Komsomolsk*.

Eisler's Film Music Project gave him the time, the New School for Social Research's institutional support, and the financial and technical assistance to reconsider cinema production from the point of view where musical production would determine final production stages and exhibition. He and Adorno wrote in *Composing for the Films* that film music, deploying advanced techniques of musical composition *and* advanced technical means of production and synchronization, must become visible in its own right in the site of cinema reception: It must "sparkle and glisten" apart from the streaming image. It may join with but develops essentially apart from the contents of the image. Here, the dialectical conflict, opposition, and synthesis are prompted by sound and image streams,

but while reflecting the film composer's touch, they are resolved by the cognition and feeling on the part of the audience. In Eisler's dialectical stream of sound and image, the audience maintains, or perhaps gains, critical distance from the cinematic exhibition by virtue of music's autonomous development sharing in the autonomous development of the serial image.

Rather than organic unity and historical pathos, or continuous ecstatic musicality in reception, in Eisler, musical exposition splits the totalized social and technical architecture of cinematic reception into two parts by virtue of active musical listening. Eisler and Adorno's description of this process encompasses the technical-professional and the ideological-intellectual positions, of which Eisenstein claimed the latter. For Eisenstein, the technical-professional axis was less important because of the character of Soviet labor, which tended to deploy professional specialization in relation to ideological and structural needs. But for Eisler and Adorno, both of whom were cultural workers in the United States when they wrote *Composing for the Films,* a critique encompassing both these axes worked toward emancipating film music composition not, say, *for* California farm workers, but *from* prejudices and bad habits. The often-observed counterpoint of sound and image for which Eisler is known does not specify a total formal separation or immediately political contestation of sound against image. Rather, it proposes that the cinema audience ultimately resolves any dialectical synthesis of art and labor beyond the site of exhibition. This reorganization of dialectical aesthetics aims at deflating, even musically diagnosing, the hysteria that Eisler and Adorno associate with the subjection of human feeling to mass-produced, standardized cultural-industrial prescriptions. It also insists on access to greater technical advances: adapting post-Schoenberg techniques for music on the one hand, but also the further automation of sound-image sync on the other.

So far, we have observed a central problem, that of the production of modern temporality as hieroglyphic: cut off from historical time or the sensible tip of radically expanded, relativistic space-time; and time contested in terms of labor and in terms of advancing technologies. And we have seen the ways in which a wide range of cinema diagrams this hieroglyph by mobilizing sound-image synchronization. Exhausting individual workers in the massive instrumentalities of networked technical systems seemed to produce not simply exhaustion or apathy but also hysteria. The films and the creative processes that produced them or that they inspired that I have introduced here thus aim at synchronizing the newly observed materiality of the streaming temporalized image *as* musical affect: the pathos of Eisenstein's devastating rhythm, the ecstatic continuity of Fischinger's visual music or *Jammin*'s cinematic jazz ensemble, Eisler's dialectical stream as diagnostics of hysteria. These musical diagrams stylize the hieroglyphic of a contemporaneity entangled in, but also separated from, the understandings of historical change their creators held. Too, all these projects anticipated further

mediations of time in terms of production labor, technology, and critical inter-pretation. In diagramming audiovisual synchronization as musical rhythm, each project diagrammed affective labor on the part of the audience in terms of musical gesture. The "synchronization of sense" in Eisenstein allows the con-temporary audience to "link" to remote historical times, to receive their imma-nent historical meanings, and to reframe the contemporary contradictions that they lived in everyday life. The choreography of cinema as a musical apparatus in Fischinger allows observation of an otherwise invisible but creative energetic temporal continuity. Eisler's musical essayism prompts critical apperception of the exhibition itself as a site of streaming but conflicted material temporality. In each case, the site of exhibition is not so much a historical repetition of a Platonic cave of flickering images as that of a Pythagorean cavern.

For Alfred North Whitehead, writing in 1925, the Pythagorean roots of "logical harmony" had served to renew and to redeem an exhausted "scientific materialism"; music rivaled philosophy as a way of thinking the limits of mod-ern techno-science, although Whitehead himself carefully keeps to philosophy.[47] Eisenstein, Fischinger, and Eisler, whose work I explore in more detail in Chap-ters 2 to 4, are less reticent. After nineteenth-century thermodynamic physics had produced the technical epistemologies necessary for automating the cal-culation of harmonic series whose technics and expressive power had once belonged primarily to music, animating the technological ensembles of stream-ing media as musical cavern allowed the measure of contemporaneity to be taken in relation to the history from which it seemed split. The measure taken in streaming media, then, is not that of form to appearance but of a relation of contemporary time to historical time.

In each of the cases I have introduced here, the musical animation of an unstable ratio of historical stream and materialized temporality prioritizes ener-getic temporality over informatic inscription. In each case, musical reception is understood in one or another sense as active mobilization calling, carrying, shifting, and elaborating audience gesture or kinesics beyond any specific infor-matic inscription of sound or image. Yet, in each case, historical time takes over. A final example from the history of cinema helps illustrate how. In Ib Melchior's minor science-fiction film *The Time Travelers* (1964), a small group of men and one woman working in a science lab rush to finish a project to open a cybernetic, televisual window to the future before they lose institutional support. As they make final adjustments, technician Carol White (Merry Anders) notices a shadow flitting across the lab; shortly afterward, in a fluke of technical function, time pressure, and group effort, they notice that the window to the future has opened—and that it is a door, not a window.

One after another, the scientists walk through the door, first to explore the future's desert landscape, then to run after colleagues fleeing the future's hostile denizens. The door closes behind them, but they are rescued from aggressive

mutants by the beautiful if severe Gadra (Joan Woodbury), who leads them to a secret laboratory where a small band of humans unaffected by the radiation of a nuclear holocaust make plans to leave Earth for good. Earth after nuclear holocaust is depicted at its most advanced in a sequence in which electrician Danny McKee (Steve Franken) is seduced by Reena (Delores Wells), who plays a futuristic color organ for him. As she moves her hands lightly over an organ keyboard, the display reacts: A series of multicolored waves ripple over its surface. The futuristic color organ's sensual special effects, in fact, were those of an actual instrument: Fischinger's Lumigraph, the gestural color instrument he patented in 1950 and presented in performance at the Coronet Theater and the Frank Perls Gallery in Los Angeles in 1951 and again at an Art in Cinema screening in San Francisco in 1953. The version seen in *The Time Travelers,* like the later brighter one seen on *The Andy Williams Show,* had been rebuilt for bright studio lighting by Fischinger's son Conrad.[48]

The narrative of *The Time Travelers,* however, does not present color-music seduction as a replacement for sex in the way William Moritz argues: In fact, one reclining couple listening to Reena's performance leaves to consummate sensuous musical pleasures in private. Rather, Reena's sensuous musical cavern counterpoints the final denouement of the film. After mutants wreck the rocket built to escape Earth, scientists and future humans must reopen the door of time and step back into the past. But when they do, they find *themselves* in a mutation of time: They learn that they were the shadows that had flickered momentarily through the lab as they tested their equipment. Now, they have closed a temporal circuit: from the branching of time diagramming actual technical development, to the future attempt to displace Earth once and for all, and back to the retrospective voyaging into a technical, instrumental time they can no longer embody.

If caring Maria could not coexist with lascivious robotic Maria, Reena's futuristic color organ alternates with but is finally dominated by Carol's computer window (Figure 1.2). Carol and her colleagues observe their own bodies as if they are a wax museum exhibit and then step through the door of time again. From this point, they unleash an algorithmically escalating loop that accelerates to the point of absolute temporal incoherence. This loop is presented as an ever-faster montage sequence, with ever-greater portions of duration deleted from it and proceeding in ever-shorter durations. At first, then, the voyagers find a musical cavern of sensuous, continuous pleasures; then, they grasp the pathos of their situation by virtue of repiecing it together; finally, they are frozen in a technical overview that obliterates any critical, situated relation to self-imaging, world imaging, or time imaging.

Their displacement in time cannot itself be displaced and so annulled, but only further compounded. Finally, then, montage cutting and visual music continuity are eclipsed in a computational feedback loop whose violent acceleration results in extreme hermeneutic violence: historical pathos, instrumental ecstatic

play, critical distance—all become illegible. In its informatic version, cinematic audiovisuality is at once frozen and exploded. The new instrument folds into its power the pathos of montage, the ecstasy of visual music, and the critical distance provided in a dialectical streaming of cinematic time. The scientists meet a fate that is opposite that of the dodo: They go extinct precisely by flying through time. The audience gains no critical grasp of a historical transformation from which it might critically extricate itself; rather, caught in the escalating loop, the audience is confused, unable to process either the media stream or its historical relations.

Of course, the film's play of, as Mary Anne Doane puts it, narrative and probabilistic tendencies was and remains legible. *The Time Travelers* diagrams the emergence of a new configuration of *bioinformatic* temporalities that disturb the old, *bioenergetic* ones, even as they incorporate them. The long metamorphosis of hieroglyphic time, whose tensions had developed in the nineteenth century and reached a peak in the mid-twentieth century, appears in its new aspect. Hieroglyphic time is doubled, its energetic aspect now subsumed to the informatic.

Moritz notes that Fischinger's influence would continue in traditional hand-drawn, computer-generated, and videographic forms. Yet Fischinger's work would also be studied as a model for expressive computer-interaction design at think tanks, such as Silicon Valley's Interval Research Corporation, along with a wide range of visual-music animation, by the effort called "Expressions" led by Joy Mountford—who supported my own research into the historical and contemporary values of visual music animation for more expressive human-computer interfaces and interaction devices.[49] This was the same context in which Marc Davis's "Media Streams" video remixing project—an important phase of whose justification reconsidered Eisenstein's theory of montage as collision of dynamic ideograms—was developed for possible commercial deployment. Other projects, meanwhile, continued the automation of synchronized media streams that Eisler and Adorno saw would reach new, as yet undetermined forms. For example, Malcolm Slaney's development of "Video Rewrite" automated the laborious processes of synchronizing synthetic lip sync so that it appears natural regardless of whoever originally spoke what is heard.[50] Inspired by such films as Robert Zemeckis's *Forrest Gump* (1994), Video Rewrite prototyped the automation of laborious processes required to produce spectacular synchronization effects, whereby historical figures might speak words they never uttered to fictive characters. Video Rewrite structured video databases for computational access to prerecorded gestures of body and voice actors, whether fictional or historical. The semantic content of the sound did not matter, only sound as recorded vocal gesture. Demonstrations of the prototype used ideal conditions: talking-head shots of staff members presenting in

direct address without moving their heads, or three-quarter profile shots of JFK from digitized video.

Such projects, then, made immanent to the new histories they were attempting to create those older inventions, relations of everyday life, or media productions originating in locations as far flung in time and space as Palo Alto, Moscow, Berlin, Los Angeles, or New York in the nineteenth and twentieth centuries. To the extent that informatic epistemologies, ontologies, and ethics were, by the 1990s, considered adequate to describing not only everyday life but also transcoding historical experience, such projects attempted to configure the mediation of experience in informatic terms, displacing the very energetic formats and methods upon which they drew. Their efforts, nonetheless, require the reconfiguration of experience and expression in terms of affective labor: the creative and interpretive task of reshaping historical time, as in user-generated content. Neither a Marxian analysis of labor value fetishized as money[51] nor Michel Foucault's discursive analysis of the statement (*enoncé*)[52] can sufficiently describe the transpositions of affective labor differentiated over time in streaming media.

Sync begins with the observation that streaming media devices are timepieces that don't tell time, then, but diagram it in affective labor. Chapters 2 to 4 explore in more detail the ways that Eisenstein, Fischinger, or Eisler *stylized* the hieroglyphic time of streaming media reception in and as temporal diagrams. In Chapters 5 to 7, *Sync* explores streaming media as complex temporal diagrams revising the classical stylistics of synchronization seen in Eisenstein, Fischinger, and Eisler after the rise of what Langston Hughes calls "an IBM land." In the final case study, I extend the implications of stylizing cinema or the digital interface as temporal diagrams of historical affective labor. We see again a familiar patterning: Where contemporaneity seems exhausted, dying out, or dangerously complex, temporal diagramming turns to music and gesture to stylize time become hieroglyphic. In every case, as temporal diagramming attempts to resolve the entanglement of material, technical, and affective labor, not only do the capacities or "medial ethics" of streaming media become clear but we also begin to discern the ways that displacements of material labor and the affects of creative labor determine publicity and personhood in relation to changing historical relations. This changing relation is not simply determined by new technologies, by new media industries, or by new formations of capital. Personhood or publicity, autonomy or governmentality, diagrammed in affective labor suggests that affective labor is biopolitical: *Biolabor* is the resource via which one historical apparatus transposes its concerns to another.

The goals of this study, then, are to explore the ways in which temporal diagrams relate determinations, displacements, and differentiations of material, technical, and affective labor according to five distinct capabilities. First, temporal diagrams presume, whether they depict them or not, the initial material, developmental conditions in which they arise. Second, they specify relations with

prior work or treatments in or of the varying ontological, epistemological, and ethical aspects of those material conditions. Third, temporal diagrams propose some disjuncture and conjuncture with those conditions and the materialities, epistemologies, and pragmatics according to which conditions become actionable. Fourth, they propose, rightly or wrongly, some measure of the relations they propose and the conditions and treatments to which they relate. Fifth, temporal diagrams propose further, not yet undertaken elaboration in other conditions and according to other treatments for other problems and resolutions.

As a result, the historical, exhibitionary, and ongoing and incomplete aspects of those situations in which temporal diagrams arise and are received may be deeply entangled in the diagrams themselves—like Chaplin's resorting to early-cinema sound conventions while using synchronized cinema sound technologies. More demonstrative or pedagogical temporal diagrams, like those of the conventional scholarly abstract of an essay or talk, may proceed with these five capabilities in sequence and as statements. But the most interesting temporal diagrams rarely do, and these are the most interesting, informing the choice of works presented here. Further, while any of these five conditions, treatments, problems, resolutions, or incomplete elaborations may be representational or propositional, they can never be exclusively so; temporal diagrams, then, may be, alternately, techno-scientific, aesthetic or expressive, or critical and reductive. Unlike James Elkins's[53] recent work on diagrammatic images from art to quantum mechanics, and unlike Stafford's echoic objects resounding between their uses in the arts and the cognitive neurosciences, *Sync* concentrates only on diagrams of affect whose presentation is primarily aesthetic and critical: those elaborated in streaming media ensembles and works.

But this focus also allows us to propose a nonteleological determination of the ways in which technology and media are deployed where personhood and publicity are related to each other in complex ensembles also relating contemporaneity and historicity. In other words, we are able to see the ethical capacities of technology and media respectively and differently. As biopolitical deployments, technology builds capacities for temporal diagramming of material, technical, and affective labor outward, through bodies, built modernity, geopolitical world space, and historical time in biopolitical tensions between sovereignty and autonomy. Conversely, media relay capacities for temporal diagramming inward through historical time, geopolitical world space, built modernities, and bodies, expressing the biopolitical tensions between personhood and publicity. Thus, more than the material labor displaced in technical operations or media exhibition, temporal diagrams exhibit affective labor. To clarify affective labor as the exhibition and reception of pathos, I turn to the first of three canonical stylistics of streaming media synchronization: Eisenstein's montage cinema. I begin with a review of the ways in which Eisenstein has functioned as an avatar of new media since Benjamin's embrace of *Potemkin* in 1927.