

F O U R

From Fixed to Fluid

Material-Mental Images Between Neural Synchronization and Computational Mediation

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The Heterogeneity of the Image

With the recent performance of composer Bruce Adolphe's *Self Comes to Mind* at the Museum of Natural History in New York City, it is safe to say that neuroscience has hit the aesthetic mainstream. Composed through active collaboration with neuroscientist Antonio Damasio and performed by the ever experimental Yo-Yo Ma, *Self Comes to Mind* is a musical piece in three parts that charts the emergence of selfhood and personal consciousness from more basic neural processes. The work is quite literally the product of a bidirectional transformational process, with Damasio reworking some of his material to address music more frontally and Adolphe distilling from this material "compositional techniques" that directly and consequentially implicate neural processes in the act of composing. Added to this mix of music and neuroscience is a third element assembled by Hanna Damasio, in her own right a leading contemporary neuroscientist—giant functional MRIs of a brain listening to music that are projected on a large screen during the performance of the work.

My interest in this work, quite aside from its aesthetic value, directly

concerns the proliferation of images that it unleashes. This proliferation is emphatically transdisciplinary: in addition to the projected images of the brain and the aural images comprising Adolphe's composition, the work's listener-viewer is made to experience various senses of the image that are enfolded into the MRIs taken themselves as material images. These images give an "objective" static picture of the total brain state—the global distributed firing patterns of the brain's neural network—at a given moment. But they also allude to the separate quasi-autonomous neural subprocesses or mental images—patterns for color imaging, for motion imaging, for orientation imaging—that must be synchronized through some form of temporal binding if they are to generate seamless, coherent experience. Indeed, we could even say that these objectifications of global brain functioning serve as ciphers opening onto a world of microtemporal mental images that form the spectral doubles, so to speak, of the ungraspable patterns occurring in the very microtemporal thickness of the listener-viewer's present experience.

What to my mind is most striking about the transdisciplinary symphony of divergent image types implicated in Adolphe's *Self Comes to Mind* is just how poorly equipped we are to address, let alone account for, how they correlate with one another. We simply lack the conceptual terminology to bridge the divide between the role and significance of the image in neuroscience and the role and significance of the image in perceptual phenomenology. Thus, despite the recent proliferation of studies devoted to art and neuroscience, including Semir Zeki's *Inner Vision* and V. S. Ramachandran's *A Brief Tour of Human Consciousness*, we remain hard-pressed to correlate mental images and material images, images in the mind and images in the world.¹ This impasse is succinctly characterized by Michael Morgan: "The problem that has dogged the philosophy of visual perception is that seeing begins with an image—the optical image in the retina—and ends in a completely different kind of image—our perceptual image of the world outside."² Schematically speaking, neuroscience concerns itself with the former kind of image—mental images—while phenomenology and media studies, to mention only those areas most relevant to my aims here, focus on the latter kind of image—images of the world or material images. For the neuroscientist, moreover, images are not limited to visual sensation, but characterize patterns of different sensory types and of different sensory origin: "we refer to images based on any sensory modality—sound images, images of movement in space—rather than to visual images only," note Antonio and Hanna Damasio in their account of how subjectivity arises from the syn-

chronization of discrete images. “Images describe both the world external to the organism as well as the world within the organism, such as visceral states, musculoskeletal structure, body movement, and so forth; and convey both nonverbal and verbal entities.”³

When neuroscience does open itself to the comprehensive picture, as I suggest it does in its forays into art, it typically skews the results in advance by favoring a very small sample of the archive of art, namely, those art forms that correlate best with its experimental procedures. As a result, art—and with it the external world per se—becomes nothing more than a trigger for the production of mental images, and the promise of the gesture of openness goes unfulfilled. Neuroscientist Semir Zeki is forthright about this bias from the very outset of his book *Inner Vision*, whose subtitle is “An Exploration of Art and the Brain”: “This is not so much a book about art,” writes Zeki; “it is more a book about the brain. It arises from my conviction that, in large measure, the function of art and the function of the visual brain are one and the same, or at least that the aims of art constitute an extension of the functions of the brain . . .”⁴ Thus, even a scientist like Zeki, who possesses marked proclivities toward transdisciplinarity, would seem to ratify the defining focus on internal representation that has served to demarcate psychological and neuroscientific approaches to cognition from their origin in the “imagery debates” of the 1970s. What Stephen Kosslyn says about his own focus in his seminal book, *Image and Brain: The Resolution of the Imagery Debate*, would thus seem to hold for the field as such, including its forays into art: “most interest in psychology has focused on only one facet of imagery—its role in information processing, not its phenomenology or role in emotional life. In this book, we will focus on the nature of the internal events that underlie the experience of ‘seeing with the mind’s eye’; we shall not consider the qualities of the experience itself. The term ‘image’ will refer to the internal representation that is used in information processing, not the experience itself.”⁵

There is, however, one site within the cognitive sciences where this impasse between the mental and the material image would appear to be overcome. The field of cognitive archaeology focuses specifically on the “*divisive* functions of image making,” and in particular on the emergence of two-dimensional images on cave walls and ceilings in the Upper Paleolithic period. For a scientist like David Lewis-Williams, it is a mistake to think that our proto-human ancestors *invented* material, two-dimensional images as a kind of image distinct from mental images. “On the contrary,” states Lewis-Wil-

liams, a notion of images *and* the vocabulary of motifs *were part of their experience* before they made parietal or portable images.”⁶ In Lewis-Williams’s account, the emergence of material, two-dimensional images on cave walls and ceilings is the correlate of the emergence of higher-order consciousness:

Once human beings had developed higher-order consciousness, they had the ability to see mental images projected onto surfaces and to experience afterimages. Here . . . is the answer to the conundrum of two-dimensional images. People did not “invent” two-dimensional images; nor did they discover them in natural marks and “macaronis.” On the contrary, their world was already invested with two-dimensional images [namely, in the form of mental images . . . projected onto surfaces “like a motion picture or slide show”]; such images were a product of the functioning of the human nervous system in altered states of consciousness and in the context of higher-order consciousness. (192–93)

Rather than representations of three-dimensional objects that are first perceived by the mind, material images are more or less direct transpositions of mental images into the world: they are, in short, originary materializations of two-dimensional mental images in a fixed, exteriorized, durable, and hence sharable form. “How then did people come to make representational images of animals and so forth out of projected mental imagery?” asks Lewis-Williams. To which he answers:

[A]t a given time, and for social reasons, the projected images of altered states were insufficient and people needed to “fix” their visions. They reached out to their emotionally charged visions and tried to touch them, to hold them in place . . . They were not inventing images. They were merely touching *what was already there*.

From this, Lewis-Williams succinctly concludes that “the first two-dimensional images were thus not two-dimensional representations of three-dimensional things in the material world, as researchers have always assumed. Rather, they were ‘fixed’ mental images” (193).

Note that among other things, “fixed” here signifies *transposed into the frame of consciousness*. What this means is that, from its very origin, the interchange between mental and material images takes place *for higher-order consciousness*. The material images that fix mental images—and that stand at the beginning of a long history of material images in world culture—are images that address consciousness proper. Two points need to be made about this correlation of material image and consciousness. First, this correlation

has literally defined the history of images in world culture up until our time: as the history of art and now of popular culture and media attests, images have been calibrated to resonate with the sensory ratios of human perception and conscious experience. To put this in explicitly temporal terms, material images have been synchronized on the basis of the temporality of consciousness, which is to say, as direct correlates of phenomenological experience. This is precisely the point Lewis-Williams makes when he notes that this transposition from mental to material image occurs in the wake of the advent of higher-order conscious experience. A second point relates directly to this temporal conception of the image and concerns what is left out of play by the archaeological and now media theoretical subsumption of the mental image as projected material image. What is left out is precisely the mental image as microtemporal pattern of cognitive activity.

The Microconscious Image

In a recent paper entitled “A Theory of Micro-consciousness,” Semir Zeki emphasizes the functional specialization of the visual brain, which “consists of many visual areas . . . specialized to process different attributes of the visual scene.”⁷ Zeki notes that, notwithstanding differences concerning the extent of functional specialization in the brain, there is consensus that color and motion, if not location and orientation, each have specialized cortical centers and neural pathways and hence that each possesses a certain degree of functional autonomy. The resulting problem raised by functional specialization of the visual brain—namely, how these distinct areas “interact to provide a unified image in the brain”—is a problem that understandably occupies many of the major figures in contemporary neuroscience: in addition to Zeki, one could list Damasio, Francis Crick, Wolf Singer, and Rodolfo Llinas, to name just some of the most prominent figures.⁸ The problem, as Zeki emphasizes, is not simply a spatial one, for the temporal windows characteristic of these separate areas in the visual brain differ significantly from one another. Thus, experimental results have shown that color is perceived before motion by 80 ms. and that location is perceived before color, and color before orientation. What results is a “temporal hierarchy of microconsciousnesses” leaving in its wake a distinctly temporal problem of synchronization: in virtue of what are these functionally specialized and quasi-autonomous areas of visual perception bound together in seamless, integrated macroconscious experience?

Zeki's answer to this problem, which distinguishes him from most if not all of his eminent colleagues, opens up a domain of what, with Gilles Deleuze, we can call transcendental (or infraempirical) sensibility.⁹ Whereas Damasio looks for an operation that would be added to the distinct patterns of the quasi-autonomous areas of the visual brain to resolve the binding problem—he calls it a “convergence zone”—Zeki embraces the more radical possibility that binding results *from nothing other than simultaneity at the microtemporal level*, from the mere fact that distinct visual mental images *happened in the same temporal window*. Now, given the temporal hierarchy invoked previously, which is to say, the significant, though still microscalar temporal divergence of imaging processes for different attributes, Zeki's position calls on him to account for the possibility of mis-binding, the situation that arises when a color sensation attached to experience at time t coincides with a “slower” motion sensation at time $t - 1$. He accounts for mis-binding, remarkably enough, by embracing it as proof of the significant autonomy of the distinct imaging processes of the visual brain:

Because of differences in time taken to perceive color and motion, subjects consistently mis-bind the color they perceived at time t to the motion perceived at time $t - 1$. Put more simply, they bind the (veridically) correct color perceived at time t with the (veridically) incorrect direction of motion, the direction that had been registered 100 ms. before. It follows that, over very brief time windows, the brain does not wait for each area to complete its processings; rather it simply binds what has been processed and reached a perceptual level. This in turn suggests strongly that *binding is a post-consciousness phenomenon*, and does not itself generate the conscious experience, as some have supposed.¹⁰

In addition to establishing that binding is a post-conscious experience, Zeki's analysis of mis-binding would seem to suggest equally strongly that the discrete processes of mental imaging involved in each of the separate areas of the visual brain are themselves “conscious,” at least in some sense of the term. Specifically, the discrete perceptions of color or motion (or location or orientation) isolated experimentally by Zeki and his colleagues are conscious at a level beneath the threshold of phenomenological consciousness. They are, paradoxically, conscious *without being conscious*: conscious to the brain without being conscious to the self or subject that, following Lewis-Williams and Damasio, is the project of higher-order consciousness. Like the wavelets that, on Leibniz's account, comprise the microperceptions

within the macrophenomenon of the wave—and that are cited by Deleuze as an example of transcendental sensation (sensation beyond the threshold of empirical experience)¹¹—these microconsciousnesses are quasi-autonomous constituents of higher-order conscious experience that can now be isolated experimentally and modulated individually.

As important and provocative as I find this conclusion, to which I will return, I want now to take stock of the more general implications of the neuroscientific exploration of visual processing and of discrete microtemporal mental images: With regard to the general question concerning images we have been pursuing thus far, what this exploration shows is that images—whether mental or material, microtemporal or macrotemporal, proto-conscious or phenomenologically conscious—are irreducibly temporal entities or processes. It is this fundamental claim that I want to place at the very core of our efforts to understand what images are in our world today: rather than their being—and indeed as the precondition for their becoming—“fixed mental” or material, images are fundamentally temporal processes or, as I will put it below, temporalizations of “light-matter.”

Dynamic Material Images

It must be said, however, that, up to this point in the history of material (or “fixed mental”) images, the burden of maintaining this temporal perspective on images has been borne by the mental side of the mental-material divide. Thus, it has been those critics focused on the reception and processing of material images—critics like Arnheim, Gombrich, and the Gestalt theorists—who have inscribed the temporal dimension into our appreciation of images, while our theorization of material images themselves has tended to ossify them as static entities. This remains true, I want to argue, even in the case of cinema, where static photograms are animated in a manner that makes them temporally dynamic for a perceiving consciousness. In my account of images and framing in *New Philosophy for New Media*, I emphasized how technical images like the photograph and the cinematogram are created by machinic apparatuses that impose a pre-given, static frame on a dynamic real.¹² Whereas I was concerned there primarily with the spatial reductions involved in this imposition, what interests me in the present context are the temporal reductions of the concept of the image that result from media-specific analyses of cinematographic technics. Even Deleuze’s con-

cept of the time image, to the extent that it relies on, or at least correlates with, a certain process of spectatorship (of actualization), serves to reinforce this main point. Whether it be equated with the photogram, the juxtaposition of discrete photograms, or the sequence of photograms comprising the shot, the cinematographic image remains a static enframing of the dynamic real: whatever dynamism the time image generates comes from its ability to “shock thought,” to set off a virtualization of the image (a proliferation of mental images?) in the mind of the spectator.

It is only with the invention of video that the material image becomes dynamic in itself, independently of the activity of the spectator. This is a point that has been recently brought home by philosopher Maurizio Lazarato, who writes:

[V]ideo technology captures movement itself: not something moving in space, but the “pure oscillations” of light . . . The video image is not an immovable still set in motion by a mechanical arrangement. Instead, it is a constantly reshaping profile painted by an electronic paintbrush. It takes its movement from the oscillations of matter—it is this oscillation itself . . . [With video, we] find ourselves in the dimension of pure oscillations, the flowing of time-matter . . . one intervenes, connects to the continual process of universal change that already existed . . . One ensconces oneself in the flow. This duration could be called “real time,” a duration that is unknown to film.¹³

As a technical process, video holds forth the possibility for a fundamentally new contact between perception and the dynamic materiality of the world in becoming. Video, in short, captures the “‘time-matter’ from which images are made.” And yet, because video simply *is* the process of generating images from electromagnetic fluxes, it frames the dynamic flux in a static or at least pre-framed form. Thus, despite the fact that there literally is no video image, that the video screen is constantly refreshing (half its scan lines being refreshed at a time, 30 times per second), what it captures remains targeted toward conscious consumption, which is to say, toward a form that is synchronous with the time of consciousness. Video artist Bill Viola perfectly captures video’s deeply rooted vocation for generating images when he observes that “the camera always works; there is always an image.”¹⁴

With the development of computational systems capable of addressing sensory fluxes at the level of their distinctive microtemporalities, we now possess the possibility to create images that would be truly dynamic. Put an-

other way, we now appear to wield the potential of simulating—and stimulating—at the level of image genesis and in the form of dynamic material images, the very process of binding that yields what Zeki and his colleagues call “compound” or cross-modal mental images. So far, the production of such images has occurred predominantly, if not exclusively, in the laboratories of neuroscientists: for example, when Zeki and his colleagues set up multi-object experiments designed to ascertain the relative frequencies of imaging processes for color, motion, location, and orientation, they are in effect creating some of the world’s first internally dynamic material images. Such images are, quite literally, visualizations of the very dynamic processes that yield images: metapictures in the dynamic environment.¹⁵

What I want to ask now, and to explore in the remainder of this essay, is whether this domain of infraempirical, temporally differentiated micro-sensation can be addressed by artists. Can those historically exemplary makers of visual images somehow engage with the raw material of sensation? And, given that such engagement by definition takes place “beneath” the threshold of phenomenological consciousness—and thus prior to the synchronization that yields material images as we have conceptualized them up to now—can artists who work on sensation even be said to create images at all?

The Cognitive Ergonomics of the Image

Let us now turn to the work of a contemporary artist who has taken the issue of microtemporal synchronization as the basis for his art production. In a career spanning two decades, Warren Neidich has created a body of work, and has articulated a theory of aesthetics, predicated on the operation of “reentry,” which Neidich appropriates from neuroscientist Gerald Edelman. The basic premise of Neidich’s aesthetics is that optical inventions, which function to deterritorialize the operation of vision from its “natural” state, contribute to the formation of what Edelman calls the “secondary repertoire,” the organization of neural elements and networks facilitated by the context in which brains develop. Because the secondary repertoire modifies the “primary repertoire,” the genetically inherited microbiological brain architecture with which we are born, it must be understood to comprise an *agent* of culture as well as a recipient of culture’s impact: themselves triggered by culture, changes in the brain feed back on culture itself. Neidich introduces the notion of “ergonomics”—initially visual and then cognitive

ergonomics—to describe the ways in which this circuit linking cognition and culture, and more specifically visual brain and optical technologies, has become subject to “artificial” control and manipulation. By means of the technical media, we engineer “phatic images” that exert an inordinate sway over our attention:

[T]he cinematic/virtual image is an image that by its very nature calls to the brain in a more direct way . . . Its structure and its reflexiveness attract attention in superior ways than images emerging from, for instance, nature, *because they have been engineered with the human nervous system in mind*. I will refer to these images . . . as “phatic,” after Paul Virilio, and to the process of their formation as “visual ergonomics,” keeping in mind that they belong to a larger process that I refer to as “cognitive ergonomics” . . . these artificially contrived images compete more effectively for neural space than their natural or organic counterparts, and build sets of neural relationships or neural networks that are in a sense artificial.¹⁶

Most crucial in Neidich’s position is the explicitly temporal basis of his understanding of cognitive ergonomics. This means that cognitive ergonomics engages directly not only with Edelman’s notion of synchronization through reentry (Neidich’s focus), but also and crucially with Zeki’s account of the microsensory functional specialization of the visual cortex. Indeed, what explains the efficacy of material (cinematic/virtual) images is precisely how they resonate with the differentiated, quasi-autonomous microtemporalities of visual processing. Those material images that “are more vivid, seductive,” and crucially “more easily resolved by the nervous system” are the ones selected for.¹⁷ Otherwise put: their operation and efficacy as “phatic” (attention-capturing) images occurs at a more fine-grained temporal level than that of consciousness; accordingly, by the time we experience images consciously, including images (like cinematographic images) that are synchronized to the time of consciousness, we will have always already, *non-consciously* “experienced” those aspects that motivated their selection.

In line with the ergonomic circuit linking cognition and culture, there are two elements to this selection: first, of course, there is the affinity I have just mentioned between the temporal basis of cognition and the microtemporality of the image. But there is also what, in anticipation of my following discussion, I would like to call an “atmospheric” or “environmental” element: through their connection to “technologies . . . for their distribution and dissemination” (to which we must now add, for their creation), these

images enjoy a selectional advantage due to their ubiquity in the spatial and informational environments in which we live. Indeed, as Neidich sees it, contemporary material images wage a selectional struggle of their own:

In the world of mediated images, these images compete with each other for the mediated spaces of television, billboards, magazine covers, and recently the internet. By building relations with other phatic images, either through design compatibility or dissemination, certain such images develop stronger attracting potentials. They are thus selected for in the context of this now-transformed real/virtual interface. (140)

What Neidich's account makes clear is just how much of this selectional struggle is waged at the microtemporal level: "we" choose images (or, perhaps better: images choose "us") not because they speak to our integrated conscious selves but rather because they grab our "motion" or "color" or "orientation" microconsciousnesses. Today's images, in short, speak directly to our brains.

While Neidich makes all of this patent and indeed specifically links the problem of binding to the functioning of contemporary technical media, his emphasis on cinema—he speaks, for instance, of the "cinematic brain"—has the effect of hampering the value of his work for addressing the image culture of computation. To the extent that he channels his conception of "cognitive ergonomics" through cinema as a privileged technology of image production, Neidich remains unable to engage or even to address the production of *internally dynamic* images. Instead of embedding cognition within informational environments that facilitate, but do not prescribe, the production of asubjective, microtemporal images, Neidich continues to correlate cognition with cinematic objects that function to prescribe the form for cognitive experience. In this respect, his insight would appear to be in advance of his understanding, for the microtemporal address of today's images occurs beneath and indeed prior to the formation of the image-objects so familiar to us from photographic and cinematic culture. To this we might add the very traditional split between the visual and the discursive that continues to inform Neidich's aesthetic project, despite his attention to the neurological level of image function. This split is a direct consequence of Neidich's inability to discriminate—and hence to disjoin—the dynamic basis of imaging at the microtemporal level from the objective images that populate our macrotemporally lived world. Because he can see no way to

contest the sway of the artificially engineered cinematic/virtual images that today dictate the formation of our secondary repertoires, Neidich finds himself compelled to turn away from the visual and (back) to the discursive to find a viable site for aesthetic resistance.¹⁸ Indeed, to the extent that his own work focuses on visualizing the process through which visual and cognitive ergonomics function, we can grasp the crucial role discursive intervention plays for Neidich. What, however, gets left out in the process is precisely any investment in deploying the microtemporal structure of visual cognition toward ends other than those of “efficiency,”¹⁹ which is to say, any possibility for contesting the sway capitalist institutions exercise over the selective struggle waged by contemporary images. Faced with this situation, we would do well to recall the quite different refrain recently intoned by philosopher Catherine Malabou: *we do not know what our brains can do*. For Malabou, the only chance for us to evade the dictates of a cognitive capitalism so deviously sophisticated that it now models itself on the very operation it would seek to control (neural networking or reentry) comes by way of an investment in the *plasticity* of our brains against their *flexibility*: we need to explore neural plasticity for itself rather than as a value serving cognitive capitalism.²⁰ Such an injunction, I want to emphasize, also invites us to explore the microtemporal dimensions of our sensory lives as something more than a new territory for scientifically informed capitalization.²¹

The Image as Microtemporal Convergence

Through his work and his theorizing, Neidich takes a step toward such an exploration. Despite his predominant focus on the “cinematic field”—which is to say, on a kind of phatic image that has been “constructed for the proclivities of the human nervous system”—Neidich’s attention to the time frame of neural subprocesses opens the possibility for a different technification of perception that would be more directly responsive to the temporal hierarchy of the visual brain, and thus to the concrete materiality of the sensory flux. “Certain kinds of temporality,” notes Neidich, “may be more efficient than others in the transfer of information. There are limits to the temporal coding patterns in the central nervous system, since certain frequencies are preferred over others.” To make this point, Neidich cites the work of neuroscientist Rodolfo Llinas, whose experiments demonstrate a privilege of oscillatory activity at the 40-Hz range in the process of binding.²² Neidich then goes on to wonder whether “certain external relations

could be coded more efficiently if they came close to matching the brain's inherent temporality?" (88–89). Ultimately, this speculation is brought home in relation to—and indeed by way of an implicit contrast to—those technologies of synchronization known as cinema and video. These time-machines are now understood to operate *on top of* the more fundamental time-machine responsible for neural binding: “the special temporal qualities of cinema, its 24 images per second, and video, its 30 images per second, *superimpose* another temporal coordinate system on the 40-Hz oscillatory potential system already in place” (94, emphasis added).

If we take this superimposition to indicate the substitution of an artificial, manufactured, phatic synchronization for a more primitive, arguably more “natural” one, we can readily understand what is at stake when cinema is promoted as our preeminent neurocultural institution. Put bluntly, such a promotion—at work both in contemporary “cognitive” capitalism and in efforts, like Neidich's, to theorize and potentially to oppose it—has the effect of imposing macrotemporal binding patterns on the microtemporality of neural oscillation. While such imposition may serve covertly to introduce a microtemporal selectional factor into the domain of macrotemporal experience (since some cinematic rhythms will be more in sync with this neural oscillatory pattern than others), it still shifts focus from the open potentiality of neural oscillation to the cinematic capture of this potentiality. With this in mind, we can grasp how the cinematic capture of neural oscillation works to impose a certain model of efficiency on the microtemporal domain of sensation. And we can grasp what is necessary to oppose such an imposition: a different technification of time, a technification that disarticulates the overcoding imposed by cinema in ways that can liberate neural flexibility (or plasticity) from its all-too-seamless integration into contemporary capitalist networks of efficiency.

To get a sense for how such a liberation might work, we would, I think, be better advised to invoke artist James Coupe's recent project, *Re-Collector*, than the film it remediates—and which, not incidentally, forms the main exhibit of Neidich's essay. The film in question is Michelangelo Antonioni's *Blow-Up*, that angst-ridden exploration of photography-as-reliable-deceptive-surrogate of memory that, for Neidich, allegorizes the splitting between natural and technical vision and the ergonomic superiority of the latter:

Thomas [the protagonist of Antonioni's film] is the product of two competitive and sometimes conflicting mnemonic codification systems. One is

a product of a kind of mimesis in which similar and synchronous originalities . . . undergo a synaptic merging; the other is a product of disparate technologies teleologized around an ergonomically driven set of relations . . . Real inputs and the networks they form will be pushed out because . . . inputs that are more ergonomically constructed and appear more frequently will create the most efficient neural networks. The result is a brain that is more and more a product of artificial phatic inputs. This is the predicament of Thomas.²³

Literally unable to bridge the gap separating his two systems of vision, Thomas undergoes a massive bodily dissolution and complete loss of the real: he cannot reconcile the space he occupies bodily with the space captured and ergonomically reprocessed by the photographic apparatus.

Coupe's *Re-Collector* is a public art installation that generates films using Julio Cortázar's story "Las Babas del Diablo"—the source for Antonioni's film—as a template. It makes use of the dense network of surveillance cameras installed in Cambridge, England: a set of these cameras are programmed to recognize and capture "cinematic behaviors" that correspond to shots from *Blow-Up*. Computer vision software analyzes the captured footage and selectively reorganizes it into a narrative sequence, based on matches to lines from Cortázar's story. These films are modified daily, as new footage disturbs the narrative balance; the result is a continually mutating story, one that is retold each day in a way that resonates with imperceptible behavioral changes of people in public space. Following each daily updating, the films are projected back into the city center, offering the public a chance to interact with and modify their behavior and perhaps to regain control of their image.²⁴

In stark contrast to Antonioni's narrative of split subjectivity, what Coupe's work offers its viewers is a chance to join in a mode of augmented, technically distributed vision capable of "seeing" the imperceptible, of perceiving nuances of movement at the microtemporal scale. Far from triggering a conflict between human and technical modes of vision, *Re-Collector* feeds microsensory data back into the scene of perception; it thus functions to expand human perception beyond the time frame germane to phenomenological consciousness. Transformed into objects of the microtemporal technical gaze, our own microtemporal movements are opened to our perception as they function to organize the constitution of images. That explains why this experience opens onto an asubjective mode of vision that, notwithstanding its impossibility from the "real-time" perspective of

our “natural” capacities, belongs as much to the human as it does to the machinic.

In this sense, *Re-Collector* is an exemplary instantiation of a perceptual logic of association that differs categorically from the logic underlying the phatic image and the institutions of cinema and television that support its production and dissemination. The reason is that it assembles images based on criteria that are *shared between* the microconsciousnesses of human sensation *and* the microtemporal processes of computer vision analysis, rather than criteria that characterize higher-order temporal and perceptual processes and that would be *imposed* on sensation *from the outside*, according to the protocols of a technology (cinema) that channels microsensation into consciously perceivable events. Thus, despite the cinematic appearance of the narratives *Re-Collector* produces, what it involves—or better, what it cinematically remediates—is a direct material *coincidence* between *two* microtemporal logics of sensation and computation, respectively. What, in sum, constitutes the image in *Re-Collector* is not the cinematic frame, but the contingencies of microtemporal frames of perceptibility: broken down into such microtemporal frames, cinematic images open out onto a subterranean world of microimages that are, in effect, microtemporal binding events.

For this reason, *Re-Collector* would appear to exploit precisely that direct contact with the sensory flux that Maurizio Lazzarato, following Nam June Paik, discerns in video technology:

[A]ll images produced by electronic and digital technologies are transformations and combinations (composites) of intensities, forces, fields, taking place in the flow—the electromagnetic flow in the case of video, the optical flow in the case of the telematic, the algorithmic flow in the case of the computer. The transition from the first to the last can be defined as an increasingly forced deterritorialization. Fibre-optic cables replace copper. Lasers and silicon cables make the control and canalization of light possible and now replace the electric shock as the vector of information bound to the net. The flow of information overcomes, again, matter, and light is just a mathematic (non-discursive) language. But in all cases, the relationship between a-significant and significant flows is the most interesting as a newly introduced paradigm—the images and sound are produced by machines with matter consisting of new materials that are being endlessly and variably modulated, and from which the flows are made.²⁵

What is modulated in the case of *Re-Collector* is precisely the microconscious

sensory reality of visual motion perception as it is controlled, transformed, and combined by the algorithmic flux of computational vision analysis. Again, the key point is that the criteria for selection of images—or better, for the *modulation* of the flux of “light-matter”—is *shared between* human sensory microconsciousnesses and microtemporal computational processes, rather than imposed in a unilinear direction by one upon the other.

For this reason, as a technical modulator of the matter of sensory flux, the computer never loses contact with embodied human perception. It is also why the modulation at stake here functions in a manner fundamentally different from what Lazzarato—here closely following Deleuze—describes. For Lazzarato, as for Deleuze before him, video and digital technologies take the place of the Bergsonian body as center of indetermination within a universe of images; what results is a massive deterritorialization of perception from its allegedly constraining correlation to human embodiment and habit:

as a relation between flows of images, between different rhythms and “durations,” [natural perception] is functionally guaranteed by the body, consciousness and memory, which operate as genuine interfaces, introducing a time of indeterminacy, elaboration and choice into the streaming of flows. I want to argue that video and information technologies function according to the same principle: they cut into the streaming of flows, producing an interval that allows for the specifically machinic organization of the relation between signifying and a-signifying flows. The functional relation is guaranteed here by a technological assemblage.²⁶

Operating as “machines to crystallize time,” video and digital technologies increase the delay between perception and reaction; in this way, they extend our power to act beyond the well-worn contractions known as habit. Yet the key question remains whether, in so doing, they sever contact with embodied sensation.

From Media Temporal Object to Sensory Atmospheric

While I have criticized Deleuze’s account of the cinema for decoupling the Bergsonian center of indetermination from its source in embodied sensation,²⁷ and while I would extend my criticism to Lazzarato’s updating of Deleuze, this argument can now—with the assistance of neuroscientific forays into microsensation—be made in a manner that more fully respects the

spirit of Deleuze's conception of transcendental sensibility. To explore the affinity of the domain of sensation explored by Deleuze—sensation “beneath” the grasp of “common sense” and “recognition”²⁸—with the technically catalyzed modulation at issue here, let me now turn from Coupe's *Re-Collector* to the work of German artist Tobias Rehberger. What Rehberger's work adds—and this will prove crucial for my effort to articulate a politics of sensation—is a potential for creative engagement with technically induced sensory fluxes. In contrast to Coupe's work, which excavates the *microsensory* “ground” of cinematic images, Rehberger's environments open experience to the creativity of micro-sensation. Thus, while *Re-Collector* proffers a divergent and microtemporal logic of association that foregrounds Neidich's point about the 24 fps of cinema being imposed on the 40-Hz timescale of sensory consciousness, Rehberger's use of light and motion creates situations that, following Gernot Böhme, we could qualify as atmospheric. As direct mediations of the microtemporal domain of sensation—what Deleuze calls transcendental sensibility—Rehberger's atmospheric situations directly solicit microtemporal sensations.²⁹

In a practice spanning nearly two decades, Rehberger has sought to liberate the sensory potential of mass-media fluxes from their overcoding in the form of what Bernard Stiegler has called industrial temporal objects.³⁰ Whereas Stiegler's position has become increasingly bleak as he seizes ever more intently on the industrialization of consciousness that occurs through cognitive capitalism's objectification of time,³¹ Rehberger strives to deobjectify media fluxes, making them available for more open and creative sensory engagement. In Rehberger's atmospheric situations, media fluxes do not comprise technical temporal objects that model the flux of time for the time-consciousness of its participants; rather these fluxes are instigations to sensory engagement that place participants into direct contact with the media environment, independently of the constitution of concrete media temporal objects. In his light installations, specifically, Rehberger operates a transformation of media-light-*objects* into sensory-light-*environments*. At stake in these works and in this theoretically inflected experiential transformation is precisely the capacity for embodied human beings to experience the very matter comprising contemporary media objects—namely, light—in a manner that does not subordinate its sensory richness to the industrialized cultural end of regulating and controlling the time of consciousness. As art historian Ina Blom puts it, Rehberger does not deploy light to illuminate

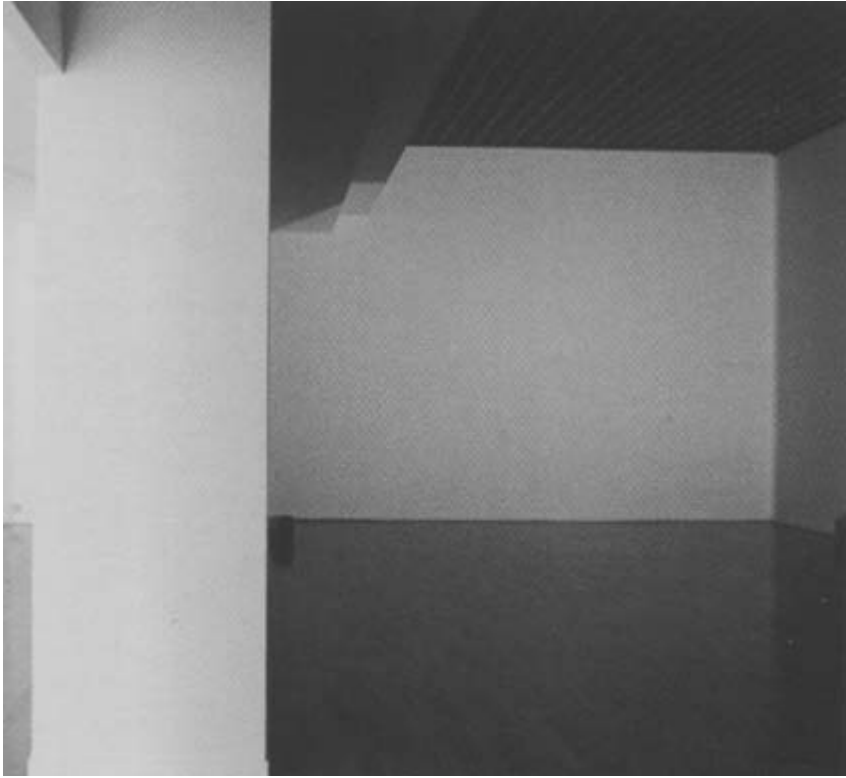


Figure 1. Tobias Rehberger. *84 Year Film*, 2002. Dimensions variable. Duration: 84 Jahre. Installation view: Night Shift, Palais de Tokyo, Paris. © Tobias Rehberger, 2002. Courtesy Neugerriemschneider, Berlin. Photo: Marc Damage, Paris

objects, as the “optical and metaphysical models” of the image would have it, but treats images as temporalizations of light: “images are not a function of light, but of time [or, we might better say, of ‘light-time’]. Images arise only as a function of the brain’s ability to contract and distribute temporal matter.”³²

The digital film *84 Year Film* (2002) comprises images of all the 2.6 million colors of which the digital video projector is capable of generating over a period of 84 years. The work begins with all pixels set to display a monochrome surface and subsequently changes each pixel to the next color in the spectrum according to an algorithmic logic. What this affords the viewer is a paradoxical experience of change *without change*, change that cannot be perceived but only sensed: thus, even as she *senses* very subtle, imperceptible

changes in light output, the viewer remains unable to *perceive* any distinct change in the image (unless she leaves the room for a while and returns). (See Figure 1.)

The experience of being sensorily coupled to this microtemporal process of minimal visual change in light has the effect of rendering imperceptible larger-scale changes in the image, as if attending to the microstructure of light's flux were incompatible with grasping overcoded light-images. As a result, critic Margit Brehm has observed, "no 'film' as such actually exists, . . . rather each 'image' is created in the very instant of its appearance."³³ Despite its title, then, *84 Year Film* is not a film—nor is it a technical or industrial temporal object—but rather an environment for direct contact with the microtemporal sensory flux that, as Zeki and Lazzarato have both argued, literally comprises the materiality of our experience. In this sense, it is crucial that there is some material element present "alongside" but "beyond perception": this element is still there, even when we are not looking, and even when we don't perceive any changes in image. Perhaps we can take this to be a minimal definition of a media atmosphere: an anti-object that can't be perceived, an anti-object that coincides with its sensory microstructure, that simply *is* a duration of sensation, the duration of its own sensibility. In this sense, Rehberger's de-objectification of media experience would seem to coincide perfectly with the perspective of Lewis-Williams: rather than reified as objects that circumscribe the experience of time, material images are here brought back to their point of origin in mental processes (or mental images). The key difference between the two perspectives is, of course, that this return is made possible by digital technology—specifically, by the technical capacity of the digitally programmed video projector to operate beyond the framework of human temporal experience.

Rehberger's *Shining Shining Shining* (2002) is an even more explicitly didactic work designed to effectuate the transformation of a captured media-light flux into a deterritorialized sensory-light environment. The structure of this work is simple: it involves the projection of Stanley Kubrick's film *The Shining* on two walls behind a screen. (See Figure 2.)

Rather than viewing the projected image directly, the viewer can see only the reflection of the projection, or better, can see only the projection via the reflected light it produces. In this way, the work explicitly transforms cinematic images, which are "phatic" organizations of light, into more elemental patterns of light, color, and motion that must be assembled by our brains to generate images.

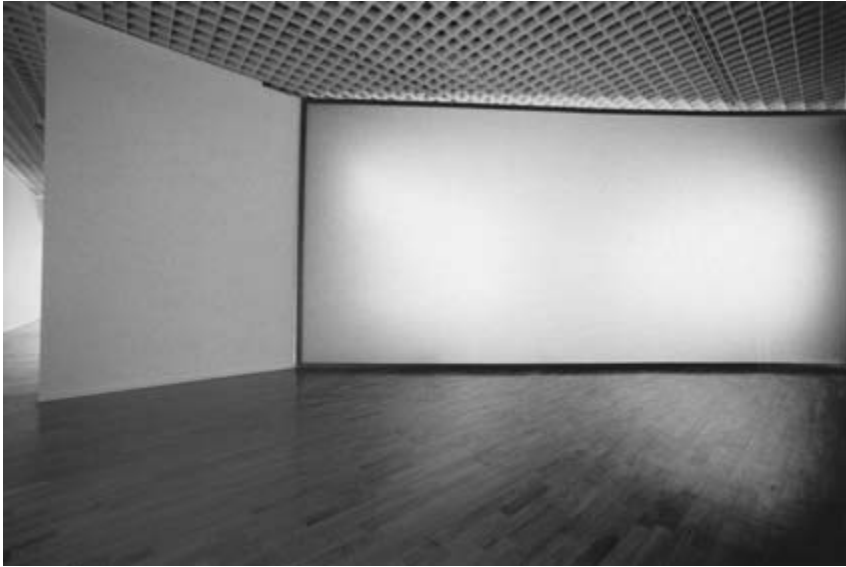


Figure 2. Tobias Rehberger. *Shining, Shining, Shining*, 2002. Wall with reflecting foil, beamer, loudspeaker, DVD-player. 390 x 1360 x 920 cm. Installation view: Night Shift, Palais de Tokyo, Paris. © Tobias Rehberger, 2002. Courtesy Neugerriemschneider, Berlin. Photo: Marc Damage, Paris

The installations *7 Ends of the World* (2003) and *All My Last Week's Desires* (2009) deploy this deterritorializing transformation of media-light-objects to effectuate connections across space and time, respectively, and thereby to create “new” experiences. The former consists of 111 lamps ordered in 9 groups and installed within an installation space. The output of these lamps is coupled with the output of the sun: as the earth circles the sun, different lamp groups are activated, shine with increasing strength, and then fade away. (See Figure 3.)

The work thus comprises “a complex solar clock” displaying the constellation of two heavenly bodies.³⁴ But it is also a clock functioning to link—to make simultaneous—different places around the world, as exemplified by a group of lamps that react to the opening and closing of a bathroom door in a restaurant outside Venice. Through its various configurations, the work enables its viewers to perceive cosmic simultaneities directly, as it were, through the microstructure of fluctuations of light. As Daniel Birnbaum puts it, the viewer sees the cosmos as “luminous simultaneity” (150).

In a related gesture, *All My Last Week's Desires* channels light patterns



Figure 3. Tobias Rehberger. *7 Ends of the World*, 2003. 222 glass lamps, light bulbs, bulb fittings, computer. Dimensions variable. Installation view: *Sogni e conflitti. La dittature dello spettatore*, 50a Esposizione Internazionale d'Arte La Biennale di Venezia, Venice 2003. ©Tobias Rehberger, 2003. Courtesy Neugerriemschneider, Berlin. Photo: Roman Mensing

from one week past into a series of light/color columns installed within a room at the Walker Center in Minneapolis. Here the suggestion is that our direct sensory contact with the flux of the real (images in Bergson's sense) can facilitate an experience of the past that is qualitatively different—more embodied and more microtemporal—than Husserlian “recollection” and its avatars (including, I would insist, Stiegler's “tertiary memory”³⁵), all of which proceed through the operations of higher-order consciousness. What Rehberger's work invites viewers to sense is nothing less than the deep continuity of time that takes place at the level of, and indeed through, microtemporal processes and that accordingly underlies and informs those selected convergences that make up memory proper.³⁶ By mediating multiple time scales through a repetition that can only be experienced microtemporally—via the production of microconscious images—the work attests to a fundamental Being of the sensible that im-

perceptibly informs conscious perception and the consumption of media temporal objects.

Toward a Comprehensive Theory of the Image

By exposing the microtemporal sensibility that comprises the matter of media temporal objects, Rehberger's installations foreground a notion of the image that resonates with the work of contemporary neuroscientists. Specifically, his works return us to a moment in the ontogenesis of images prior to the division between material and mental: in a quite literal sense, they transform material media images—including paradigmatic examples of technical temporal objects—*back into* sensory accumulations that must be microtemporally assembled into mental images (Zeki's microconsciousnesses) before they can become (macrotemporal) material images proper. Put more simply, Rehberger's atmospheric light environments compel us to generate images directly on the basis of microsensation, rather than through the mediation of frames—like the cinematic frame—that capture sensation for conscious perception. What remains for us to consider is just how this resonance of Rehberger's work with contemporary neuroscientific research into microsensation might impact our conceptualization of what an image is. How, in short, must we theorize the image in order to think the microtemporal experience that comprises its very materiality?

I began my discussion by emphasizing the need for a comprehensive theory of the image, by which I mean a theory capable of addressing the *continuum* connecting mental and material images. This led me to characterize the image as a temporal process rather than a spatial/visual figure. Now that we have opened the microtemporal dimension of the image as a process of temporal binding, it is imperative that we address this *continuum* at a level beneath the threshold of recognition imposed by phenomenological consciousness. This contemporary imperative arises in the context of the shift in marketing strategy and capitalist logic that has resulted from the neuroscientific revolution: in the wake of the cognitive ergonomics underlying contemporary images, it becomes clear that material images that appeal directly to the microtemporal processes of mental imaging acquire a distinct selectional advantage. Correlated with this shift in the logic of "image capitalism" is a *broad transformation in the mode of address* that characterizes the everyday technologies on which we have come increasingly to rely: wireless devices of all sorts, including cell phones and sensor technologies, as

well as computers in general, function by constituting images that largely bypass the optical. Such images can perhaps best be described as cognitive or microcognitive events, and they function typically by giving information about how to act in a given situation or by tailoring environments to facilitate certain kinds of action.

Broadening our approach in this way allows us to appreciate that what holds mental and material images together—even as both undergo fundamental shifts in temporal scale and mode of address—is nothing other than human experience. That explains why computational technologies form a complement to neuroscientific insight into microconsciousnesses and the domain of microsensation, and also why neuroscientific research couldn't occur without the aid of computation. Indeed, this appreciation for the central role of human experience (which emphatically does not mean conscious experience) has guided my decision to correlate the neuroscientific revolution in imaging with the computational revolution in media as complementary instigators of a basic rethinking of the image as temporal process. My broad aim has been to situate and to address the image within the larger context of our co-evolution with technics (what I have elsewhere called human technogenesis³⁷). At the heart of this endeavor is a conviction that today's microtemporal digital technologies do not simply impact human sensory experience from the outside, but rather materialize a potentiality that characterizes sensory experience from its very origin and at its most primitive stages.³⁸

While there is much that is contingent in the development of contemporary digital technologies, including elements I would attribute to the certain autonomy that characterizes the technical history of computing, my claim is that this development actualizes a potentiality that has been there from the start. Or, to be more precise, I want to suggest that the shift to the microtemporal address characteristic of today's wireless technologies and ubiquitous computational networks exteriorizes the human power of imaging in a manner that exposes not just the microtemporal domain of sensation but also the motricity underlying (and holding primacy over) perception. In this respect, I propose to add a level of specificity to the enactive understanding of perception that has been developed by Francisco Varela and his colleagues:³⁹ for if sensibility is rooted in motricity, as French philosopher Gilbert Simondon has insisted and as Zeki's account of microsensation implies, then enaction does not coincide with perception, but characterizes the processing of sensation at the neural level.

What is required to conceptualize the image for our age of micro-temporal computation and neuroscientific insight is a theorization that positions the human—human imagination—as a hinge between mental processing and technical networks. In his lecture course from 1965 to 1966, *Imagination and Invention*, Gilbert Simondon provides just such a theorization. As we would expect from this philosopher of the continuity of individuation from the physical to the collective, Simondon’s exploration develops a comprehensive account of imaging and imagination across all registers of human individuation, including its apotheosis in technics. Specifically, Simondon differentiates three developmental stages of the image: a “pure and spontaneous development” in which the image figures as an “embryo of motor and perceptive activity”; a functional development in which the image “becomes a mode of reception of information coming from the milieu and a source of schemas of response to these stimulations”; and an “organization of images according to a systematic mode of linkages,” rooted in “affective-emotive retention,” that yields in the subject “*an analogue of the exterior milieu*.”⁴⁰ What is crucial in Simondon’s theory is that these stages of the image exist in continuity not only with one another but also with the operation of invention, in which images qua mental symbols undergo a “change of organization” and a shift to a different order of magnitude. Not only does Simondon thus present a comprehensive theory of the image, but he also correlates the image, on the basis of its intrinsic dynamics, with the operation of technical exteriorization through invention.

The crucial task of unpacking the continuity linking the image in its primordial, pre-objectal functioning with the passage to invention comprises the central aim of Simondon’s course, as he acknowledges from the very outset:

This course presents a theory: the aspects of the mental image that have furnished material for previously published discussions and studies do not correspond to different species of realities, but to stages of a single unique activity undergoing a process of development . . . According to this theory of the cycle of the image, reproductive imagination and invention are neither separate realities nor opposed terms, but successive phases of a single unique process of genesis . . . (3)

Viewed on the basis of this dynamic process of genesis, the image cannot be reductively identified with any of its specific forms, whether these be

considered mental or material images, but must be addressed as a dynamic, temporal process that is simultaneously both local in its operation (images always address and seek to resolve cycle-specific problems) and part of a broader genesis.

The Autonomy of the Image

Simondon's dynamic, genetic perspective is anchored in two crucial, correlated, and, to my mind, counterintuitive claims about the image: first, that the image operates independently from and transversally to the organism or subject; and second, that across all three of its stages, the image always reaches beyond itself, which is to say, beyond its subjective being, thereby underscoring "the primitive exteriority of images [including mental images] in relation to the subject" (7). Together, these two claims underscore the virtual amplification through which the image, in each of its stages, can be understood to include invention:

The tendency to exceed the individual-subject [*l'individu sujet*] that is actualized in invention is . . . virtually contained in the three anterior stages of the cycle of the image; the amplifying projection of the motor tendency, prior to the experience of the object, is an implicit hypothesis of deployment in the world; the perceptual categories [*classes perceptives*] made use of by the subjective system of reception of incidental information postulate a universal application; finally, the symbolic bond of image-memories, if it expresses in a centripetal sense the attachment of the subject to the situations that have constituted its history, also and above all makes possible the operation of reversibility that converts it into a means of access to things. At each of these three stages of its genesis, the mental image is not limited by the individual subject that contains it [*qui la porte*]. (186)

It is precisely in virtue of the autonomy of the image in relation to the subject and the constitutive metastability that connects it virtually to invention that Simondon can characterize the image as having an intermediate status: between subject and object perhaps above all, but also between abstract and concrete, local and global, ego [*moi*] and world, and ultimately, mental and material.

Indeed, it is the autonomy of the mental image in relation to the subject that catalyzes not simply the genesis of the image as such, but the *bidirectional flow between the mental and material* on which I have insisted from the outset and from which the subject emerges:

As intermediary reality between the abstract and the concrete, between the ego [*moi*] and the world, the image is not only mental: it materializes itself [*se matérialise*], becomes institution, product, resource [*richesse*], and is diffused as much by commercial networks as by the “*mass media*” that transmit information. Made of consciousness but also object, its intermediate character gives it an intense capacity for propagation. . . . The circular causality that flows from the mental to the objective real by way of social processes of cumulative causality, flow also from the objective real to the mental. Every image is susceptible of being incorporated into a process of recurrence that can be *either* materializing *or* idealizing. Inserted into fashion, art, monuments, technical objects, the image becomes a source of complex perceptions that generate movement, cognitive representation, affections and emotions. Nearly all the objects produced by humans are to some degree object-images: they carry latent meanings that are not only cognitive, but also conative and affectivo-emotive. Object-images are nearly organisms, or at the very least, germs capable of coming back to life and developing in the subject. (13)

What must be emphasized here is just how closely Simondon’s description of the quasi-living object-image correlates to our earlier treatment of imaging as a process operating at the level of microsensation. Indeed, Simondon’s description might be taken for an account of a “phatic” image that operates not at the level of consciousness and recognition, but at the level of the microtemporal processes that form the pre-individual basis for the emergence of this level. On Simondon’s account, images, in their back-and-forth flow between the material world and the mental realm, do not so much support the experience of the subject as open a coupling of organism and world that is fundamentally independent from the one performed by consciousness.

Noting just how recent a phenomenon the attribution of images to subjectivity in fact is (he says it began in the seventeenth century), Simondon emphasizes precisely that dimension of the image’s autonomy that informs my appropriation of Neidich’s cognitive ergonomics: its operation at microtemporal scales beneath subjectively unified experience. Indeed, Simondon insists that “even in the best of cases [i.e., cases where the image does indeed function to facilitate conscious understanding] the act of becoming conscious [*la prise de conscience*] [hardly] exhausts all the reality of this local activity. One can suppose on the contrary,” he continues, “that the conscious aspects of the local activity are nearly exceptional cases of manifestation [*affleurement*] that are linked with a continuous framework; they are linked to an infrastructure [*soubassement*] that bears them after having prepared

them” (4). If we take this distinction as an effort to restore the microsensory dimension of material images, we can appreciate how it brings them into line with the operation of microtemporal mental images, which is to say, with those very images that coincide with Zeki’s quasi-autonomous micro-consciousnesses and that inform the ontogenesis of consciousness and any image-objects that might have emerged as its correlate.

To his general claim for image’s excess over consciousness, Simondon adds a richness of metaphoric detail that serves to emphasize the autonomy of the image: thus, he suggests, images conserve “a certain *opacity* as a *foreign* population within a well-organized state . . . they appear nearly like secondary organisms within the thinking being: *parasites* or adjuvants, they are like secondary monads that at certain moments inhabit the subject and at others leave it.” Throughout this shifting coexistence with and in the subject, images—and of this Simondon leaves no doubt—comprise processes that remain autonomous from unified subjective experience: “One could assume,” Simondon continues, “that this character at once objective and subjective of images in fact translates this quasi-organismic status that the image possesses insofar as it inhabits the subject and develops itself within it *with a relative independence in relation to unified and conscious activity*” (9, emphasis added). What is at stake in this independence is precisely the agency of the image: its capacity to “resist free will, to refuse to let itself be directed by the will of the subject, and to present itself according to its own proper forces, *as inhabiting consciousness like an intruder who has just upset the order of a house to which he was not invited*” (7, emphasis added).

The Politics of the Image

Whether this agency be deployed to control cognitive fluxes and bring them into line with the mandates of contemporary “cognitive” capitalism (as I think happens in “cognitive ergonomics”), or, alternatively, to open up new non-subjective, pre-conscious, microtemporal levels of cognitive agency (the promise I locate in Rehberger’s transformation of fixed images into dynamic sensory atmospheres), in political terms what is crucial about the autonomy of the image is the priority it lends to (asubjective, microtemporal) sensibility as against (subjective, conscious) objectal perception. Suffice it to say here that Simondon’s comprehensive, genetic theory of the image, which correlates imagination and invention as transductive operations of

embodied human beings, cuts against the grain of the modern phenomenological tradition that, from Husserl to Sartre, has defined imagination and the image as absent or unfulfilled perception, as perception with nothing for content.⁴¹ Indeed, it is here that we can discern the promise of neuroscientific research for rejuvenating the project of phenomenology, since it opens access to a domain of sensory life that was necessarily bracketed out by phenomenological research in its classical period. More simply put, neuroscience—as exemplified by Varela’s account of the Husserlian model of time-consciousness—opens the possibility to integrate microtemporal sensation into the domain of what is given in experience.⁴² In so doing, as I have argued elsewhere, neuroscience converges, in an altogether remarkable development, with the insights of Husserl’s final research into time in the *C-Manuscripts* (1929–34) and with the work of such disciples as Eugen Fink and Jan Patočka. For Simondon, whom we might number with these key disciples, image and imagination are more primitive than perception; indeed, it is precisely because of their constitutive microtemporality that they form the basis, the domain of transcendental sensibility, from which perception emerges.⁴³

In line with this priority (and with the general solidarity with Bergson that, according to Jean-Yves Chateau, it expresses⁴⁴), Simondon’s theory holds the promise of articulating a politics of images that refuses to cede control over the organization of the sensory to the cultural and information industries central to contemporary cognitive capitalism. Put another way, Simondon’s investment of the pre-objectal sensibility of images against the perception of objects opens an approach to the struggle for technical control over the time of media that diverges fundamentally from those approaches (from the Situationists to Stiegler, and even, in a sense, all the way up to Neidich) that focus on media technical objects as operating autonomous syntheses of experiential time. By defending the autonomy of the sensory, Simondon is able to correlate the image with motricity *prior* to the advent of perception and to maintain its independence from object perception; this fundamental correlation of image with motricity stretches from the primordial motricity of sensibility itself (for example, the way a one-celled organism develops a polarity *as the expression, or enaction, of its sensibility*) to the technically exteriorized motricity afforded by today’s digital networks and ubiquitous computational environments. Indeed, the persistence of this independence across the distinct stages of the image attests to the priority

that motricity holds as the very operator of the entire genesis that runs from the primitive, “autocinetic” image to the organized system realized through its technical exteriorization and including living imagination “as subset.” In this respect, Simondon’s genetic theory of the image makes common cause with Catherine Malabou’s recent plea for “plasticity” as a successor to “writing,” “as a new *pure historical image*”: it is plasticity and not writing.” Malabou insists, that “imposes itself . . . as the most adequate and most eloquent *motor schema* for our time.”⁴⁵

Given the centrality of motricity within Simondon’s theory (he argues, both in the *Imagination* course and in his lectures from the year prior on perception, that motricity is more primary than sensibility⁴⁶), it is not in the least surprising that he should choose to conclude his course with a reminder of the plastic continuity or continuous plasticity that stretches from primitive autocinesis to technicity and that renders motricity a general figure, a *pure historical image*, for thinking the transduction of life and technics today: “At the moment of its progress toward invention, the cycle of the image perhaps appears as an elevated degree of the activity of the living being considered, even in its most primitive forms, as an autocinetic system in interaction with a milieu. The autocinetic character, which is manifested by the motor initiative in the least elevated forms, translates in forms with complex nervous systems into the spontaneity of functioning that primes, *before the encounter with the object*, the cycle of the image and that culminates in invention.”⁴⁷

In conclusion, let me underscore the singularity of Simondon’s contribution to the historical correlation of sensibility and technics. As I see it, a defense of the autonomy of the sensory is necessary if we are to appreciate the experiential and evolutionary significance of the convergence between microtemporal media and microtemporal cognition that has only just begun to transform how we live today. If today’s social media networks, ubiquitous computational environments, and wireless digital devices are in the process of generating a new kind of image that operates through direct transduction with the microtemporal operations of human cognition and imaging, our task as cultural theorists is to find ways of addressing and theorizing this transduction without reducing it to a higher-order exchange between consciousness and perceptual object. It is precisely toward such an end—a concept of the fluid image—that Simondon’s comprehensive theory of images can lead us.