

bodies in code, or how primordial tactility introjects technics into human life

Artificial realities are based on the premise that the perceptual intelligence that all men share is more powerful than the symbol manipulation skills that are the province of the few.

Myron Krueger¹

1. "MAKE USE OF WHAT NATURE HAS GIVEN US!"

If Myron Krueger deserves to be heralded as the pioneer of interactive media art, this has more to do with the aesthetic qualities of his interactive platform than its undeniable technical contribution. From the beginning, Krueger's interest concerned the *enactive* potentialities afforded by the new media and not their representational or simulational capacities. He recalled this commitment in a recent interview:

In 1970, I considered HMDs (head mounted displays) and rejected them because I thought whatever benefit they provided in visual immersion was offset by the encumbering paraphernalia which I felt would distance participants from the world they were supposed to feel immersed in. When I pondered what the ultimate experience would feel like, I decided that it *should be indistinguishable from real experience*. It would not be separated from reality by a process of suiting up, wearing gear, and being tethered to a computer by unseen wires.... Rather than limiting your participation to a single handheld 3D pointing device, your image would appear in the world and every action of your body could be responded to instantaneously. Whereas the HMD folks thought that 3D scenery was the essence of reality, I felt that *the degree of physical involvement was the measure of immersion.*²

In an artistic (and engineering) career wagered on this commitment, Krueger has quite literally sketched out an alternative trajectory to that followed by mainstream virtual reality research, art practice, and cultural ideology. Rather than investing in the simulational power of the image and the ocularcentric paradigm of immersion, Krueger has staked everything on the constructive power of (human) embodiment. For him, virtual reality technologies are important, indeed momentous, not because they lend new, stronger material support for the image (whether it is conceptualized in the frame or the panorama traditions), but precisely because they extend the body's power to construct space and world.

In this deployment, technologies work to expand the body's motile, tactile, and visual interface with the environment; to do so, they call upon—and ultimately, refunctionalize—the body's role as an “invariant,” a fundamental access onto the world, what psychologists and phenomenologists have called the “body schema.” In this way, digital technologies lend support to a phenomenological account of embodiment and expose the technical element that has always inhabited and mediated our embodied coupling with the world. Indeed, as we shall see, they add a technohistorical basis to the claims of those contemporary researchers who not only align the body schema with proprioception but also propose this latter as a sixth (and more fundamental or somehow originary) sense.

This subordination of technics to embodied enactment motivates (and licenses) me to position Krueger as the precursor—and first practitioner—of second-generation virtual (or mixed) reality. Together with

the more interesting digital artists of today (indeed, in many cases, as a direct inspiration to them), Krueger views and deploys the virtual less as an alternate, body-transcending space than as a new, computer-enhanced (if not in some important sense, computer-facilitated) domain of affordances for extending our evolutionarily accomplished interface with the world. Understood against this background, Krueger's renegade act of renaming can be seen to mount an aesthetic, indeed properly philosophical, challenge to the mainstream. As Krueger explains, the term “artificial reality” more aptly captures how “virtual reality” functioned, not simply or primarily as a technical platform, but rather as a “metaphor for what was happening throughout our society” (Turner).

Yet, if Krueger's theory and work resonate with the second-generation paradigm of mixed reality, this is due less to his original aim (provoking the flat-footed humanism of the art worldⁱ) than to the singular convergence of the “artificial” and the “natural” in the electronics technologies ubiquitous in our world today.ⁱⁱ This is a reality not lost on Krueger, who has recently noted: “Since I was arguing for convenience, naturalness, and obviousness, my concepts were well-positioned for technological advances as they unfolded. Since 99% of applications are 2D and 99% of 3D applications are driven by 2D interfaces, there has been very little immediate interest in HMD immersion systems in the general office environment,” not to mention the world beyond. As if echoing (or ventriloquizing) the proponents of the mixed reality paradigm, Krueger speaks of a “progression towards external realities” driven by the technical development of low-cost projectors and organic LED displays that can be ubiquitously embedded in the environment; rather than withdrawing from the physical domain, today's digital technologies are literally virtualizing the physical.

Krueger's calculated defense of the artificial notwithstanding, the operative principle of his research and artistic experimentation could easily be summarized in the form of a practical maxim: *make use of what nature has given us!* “In our physical reality,” Krueger observes, “We use our bodies to interact with objects. We move our bodies or turn our heads to see better. We see other people and they can see us. We have acquired a consistent set of expectations through a lifetime of experience” (148). Making use of this evolutionarily realized heritage will allow us to adapt to our ever more rapidly changing technical environment because such heritage provides a stable background against which to assimilate new interactional spaces and share new affordances: “Any

system that observes these conventions will be instantly understood by everyone on the planet" (148).

More than a simple desire to buck the technician trend, Krueger's work is informed by his conviction that the best way for us to bring technologies to bear on human existence—to shepherd our ongoing technogenesis as it undergoes its most accelerated phase to date—is to channel them through our evolutionarily acquired embodiment. This explains his lifelong commitment to a humanist model in which human interaction (encompassing interaction with the self, with others, and with machines) prevails over any notion of technician instrumentalization. Krueger's environments function practically, following the characterization of Howard Rheingold, as "laboratories for finding out how humans might harmonize with" technical environments whose sway is (and has always been) inescapable.^{iii.3}

The benefits of such an artistic (and scientific) program are two-fold: On one hand, human embodiment serves to "naturalize" technical modifications of the world (and, potentially, of the body); on the other hand, these modifications provide an important source for decoupling or deterritorialization by which the body's habitual intercourse with the world gets disturbed and (potentially) expanded. Embodiment accommodates and self-reorganizes in the face of the ever expanding scope of technics in our world today.

In a series of works culminating in the ground-breaking video projection system *Videoplace*, Krueger has sought to materialize his conviction that "the focus of interface research should be on human nature, not on the transient computer" (Krueger, "An Easy Entry," 147). This conviction has led him to construct environments that eschew the logic emanating from computer code in favor of emergent logics rooted in social conventions. Never an end in itself in Krueger's work, the computer is always a vehicle for exploring and expanding embodied (human) interaction with the world and with other human beings. "In the ultimate interface," he stresses, "input should come from our voices and bodies and output should be directed at all our senses. Since we will also interact with each other through computers, the ultimate interface should also be judged by how well it helps us to relate to each other" (147).

This principled emphasis on human embodiment as mediator between computer and world represents something new in the history of our technogenesis: in its role as primary access to a (now) highly technologized

lifeworld, embodiment serves to couple body and world, as well as to actualize the potential of digital (virtual reality) technologies to modify the lifeworld (and, thereby, to infiltrate that primary enactive, world-constitutive coupling). Embodied enactment is, quite literally, the agent through which technics has an impact on life and the lifeworld.

If Krueger's entire career seems dedicated to exposing nothing more or less than this primacy of embodied enactment, the latter—as he points out—ushers in an important, and enabling, margin of indetermination: "The logical consequence of this thought process [yielding the conception of the ultimate interface] was the concept of an artificial reality in which the laws of cause and effect were designed to facilitate the functions that interested the user" (148). It would hardly be an exaggeration to claim that this margin of indetermination—one directly tied to technics—comprises the operative principle of Krueger's embodied aesthetics of new media. The new technical environments afford nothing less than an opportunity to *suspend* habitual causal patterns and, subsequently, to *forge* new patterns through the medium of embodiment—that is, by tapping into the flexibility (or potentiality) that characterizes humans as fundamentally embodied creatures.

That this principle comprises the explicit focus of Krueger's first, predigital responsive environment amply attests to its centrality in his aesthetics. *Glowflow* (1969) is a light-sound environment—a room with four horizontal light tubes running along its walls—that deploys visual and auditory means to disturb the visitor's habitual mode of perceiving space (see Figure 1.1). The room is entirely dark except for the multi-colored phosphorescent light tubes which form the only visual point of reference for the visitor. Movement within the darkened space inevitably causes the visitor to step on floor sensors that release into the tubes light and sound elements from one of four enclosed light columns (one per tube). Outside of this element of interactivity, the pigments running through the tubes remain arbitrarily determined.

What proved compelling about the environment and most captivated Krueger's aesthetic interest was the way that viewers inevitably, one might even want to say "naturally," attempted to make sense of the environment by coupling intentional gestures (e.g., speaking or moving) with the (mostly arbitrary) patterns of light in the tubes. As Krueger recounts in *Artificial Reality 2*,

If a tube started glowing after [the visitors] spoke, they would assume that their speech had turned it on. If a sound occurred after

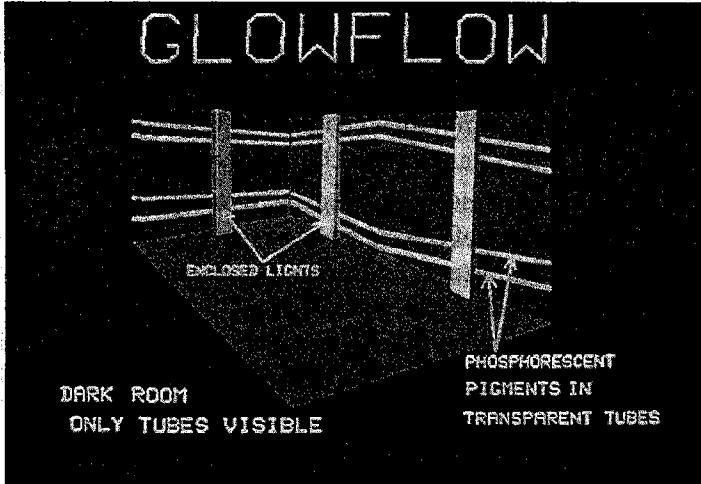


FIGURE 1.1 Myron Krueger, *Glowflow* (1969), light-sound reactive environment that deploys visual and auditory means to disturb the visitor's habitual mode of perceiving space. (Courtesy of the artist.)

they hit the wall, they would assume that striking the wall would elicit more sounds. Often, they would persist in the behavior long after the result should have convinced them that their hypotheses were incorrect.⁴

This emergent and unexpected phenomenon alerted Krueger to the possibility and value of exploiting the margin of indetermination afforded by experience with new technologies and media environments.^{iv} As Söke Dinkla has observed,

The behavior of the visitor comprised efforts to figure out the rule system of *Glowflow*. The process of rational clarification of cause and effect proceeded precisely opposite to its normal pattern: an effect would dictate its cause and not the reverse [*Einer Wirkung wurde eine Ursache zugeschrieben und nicht umgekehrt*]. Such exploratory behavior is typical when it is a question of accommodating oneself to foreign surroundings whose rules are unknown. (67)

In one way or another, all of Krueger's environments exploit this technique of disturbing habitual cause and effect couplings to domesticate novel experiential domains through the primary medium of embodiment.

With his subsequent (and properly digital) environments, however, Krueger added a crucial element to this technique of domestication: the calculated feedback of new sensory experiences into embodied enactment for the express purpose of expanding the latter's agency (together with

the scope of its coupling with the environment).^v What made this possible and served to distinguish Krueger's environments from the majority of art environments from the 1960s was Krueger's insistence on clarifying for the visitor precisely how his or her actions called forth reactions from the environment. Because this insistence is due, in part at least, to the analytical precision afforded by the computer as a material support for the interactive environment, it yields a specific, technical (but not technicist) conception of interactivity: "dealings [einen Umgang] with the computer in which the receiver/user is able clearly to correlate her actions with the reactions of the system" (Dinkla, 70). Such correlation, affirms artist Simon Penny, comprises "the first and fundamental law of the aesthetics of interactive installation" (Simon Penny, email to the author, January 3, 2006).

On this conception, interactivity can be distinguished from prevailing notions of the period and from more contemporary technicist visions. It is at once more codified than the radically open-ended environments of process art and happenings and yet more open and flexible than the preprogrammed response repertoires that one finds in so-called interactive cinema and hypertext. What is crucial in Krueger's conception of interactivity, as in his humanist conception of artificial reality more generally, is the privilege accorded embodied (human) agents. Differences notwithstanding, the point of all of his environments is to facilitate new kinds of world-construction and intersubjective communication. If these environments do still serve as interfaces to the computer, they do not do so, as do all technicist conceptions of the "Human-Computer Interface" (including the mouse and the graphical-user interface), by instrumentalizing—and thus reducing—embodied enactment; here, rather, it is the technology that remains instrumentalized and human action that gets privileged.

From 1970 to 1984 (when he ceased development of his interactive platform, *Videoplaces*), Krueger devoted himself to the task of producing an environment that would realize the potential of the computer to expand human capacities for embodied enactment and communication. Not surprisingly, this realization—accomplished in *Videoplaces*—proceeded through several discrete stages, each of which marks an important advance in the transfer of agency from the computer to embodiment in open-ended feedback with itself.

Metaplay (1970) combined closed-circuit (video) technology with the computer to explore the conditions for the correlation by the visitor

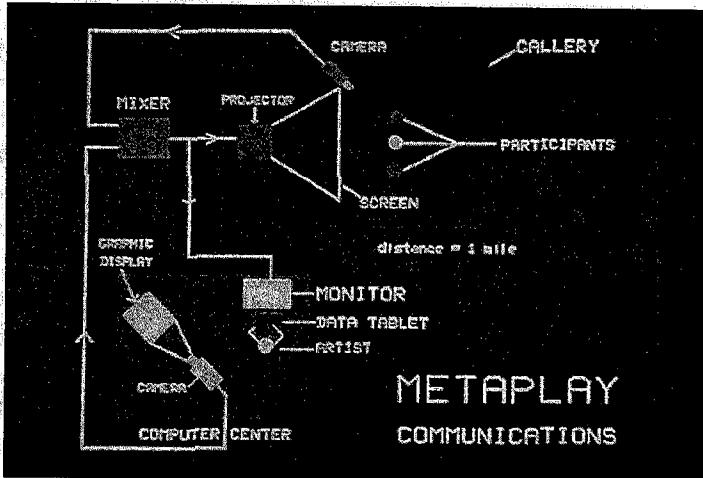


FIGURE 1.2 Myron Krueger, *Metaplay* (1970), interactive environment, functional diagram. (Courtesy of the artist.)

of her actions and the system's reactions. This environment established a real-time communication circuit between participants in a gallery, who encounter a projected two-dimensional image of their bodies, and the artist who, located in a separate space, employs a data-tablet and pen to draw directly on the projection screen, thereby provoking responses from and stimulating further interaction with the visitors (see Figure 1.2). As Andy Cameron has recently pointed out, *Metaplay* offered Krueger an opportunity to "explore the kinds of interactions which he had been unable to explore in *Glowflow*—an interaction which is *explicit* and which is capable of engaging people within a new kind of aesthetic experience."⁵

Rather than the amorphous and nondirected action–reaction couplings that spontaneously (and most often erroneously) emerged in *Glowflow*, *Metaplay* clarifies the correlation of (visitor) action and (system) reaction precisely by isolating it and embedding it within a tightly coupled, clearly delineated circuit. To achieve this isolation, the environment sacrifices the autonomy of response. As Cameron notes, because the technology to create a truly interactive computer-supported responsive environment was unavailable (at least to Krueger), he was forced "to simulate interactive technology, using people behind a screen [the artist, in the case of *Metaplay*] to provide the system responses. In this odd and oddly productive reversal of the classic Turing test, the "participants would think they were interacting with an interactive environment,

but in fact they would be interacting with concealed human beings" (Cameron, 18).

What the environment gains from this sacrifice is the creativity of indirection, here instantiated in the margin of indeterminacy emerging in the space between Krueger's doodlings and the visitor's responses. Because the action–response circuit involves something beyond what can be contained in or determined by any technological interface—something *unpredictable* from the system's perspective—it privileges creativity over technicity. As Cameron suggests, this achievement—generating a working prototype of a new kind of communication with the paltriest of resources—is Krueger's most impressive: "By prototyping the experience, rather than the technology, ... Krueger was able to explore the aesthetic space of an interactive installation before the technology existed" (Cameron, 18).

When the source of indirection is subsequently integrated into the technical circuit, as it is in *Psychic Space* (1971), it simply cannot betoken any kind of break with Krueger's thoroughgoing privileging of the aesthetic over the technical. Rather, what is at stake here is a (partial) restoration of autonomy to the responsive environment, a restoration accomplished through the incorporation of feedback—and with it, of the element of *unpredictability*—as an internal aspect of the installation's solicitation and process-based generation of experience (see Figure 1.3). In this sense, *Psychic Space* marks a monumental accomplishment: the *extrinsic* source

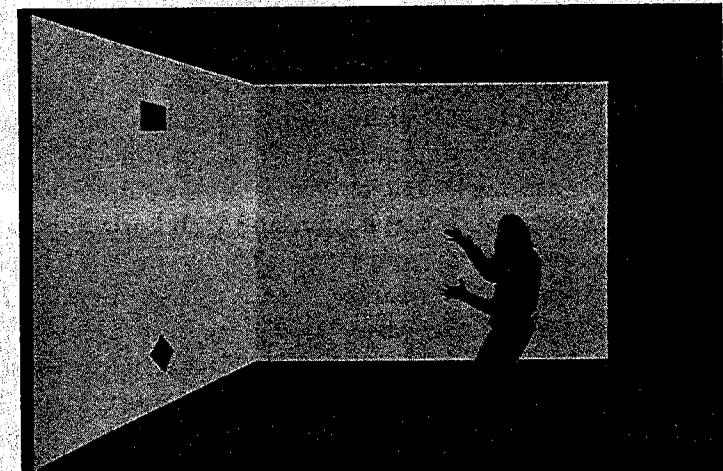


FIGURE 1.3 Myron Krueger, *Psychic Space* (1971), interactive environment. (Courtesy of the artist.)

of creative indirection—Krueger's doodlings—is replaced by an *intrinsic* and *ineliminable* source—the embodied viewer's self-movement.

The operative technical element of this intrinsic feedback circuit is the use of motion sensors (in the place of the artist's external intervention); by placing the visitor into real-time interaction with data capturing the movement of her reactions within the environment, *Psychic Space* transforms embodied movement into the source of creative indetermination and, consequently, into the aesthetic focus of the environment. Dinkla emphasizes the (relative) novelty of this configuration:

[*Psychic Space*] confronts the visitor ... with the graphic, projected image of a lozenge that follows her movement. Just as Krueger moved the pen across the data tablet in *Metoplay*, now the visitor can couple herself to the graphic symbol through her embodied movement. The fact that the visitor engages in communication by way of her body stands in stark contrast to the typical interchange with the computer from this time (Dinkla, 73, emphasis added)

Although the visitor is initially invited to focus on the lozenge's function as a symbol of her self, the lozenge soon becomes enclosed by a small square that, triggered by the visitor's effort to move beyond this confine, then becomes a maze within which she is beckoned to wander freely. The aesthetic interest of the environment is thus shifted from the feedback circuit to the interactive possibilities that it facilitates.

In stark contrast to typical computer games, these possibilities offered by *Psychic Space* are not guided by any clearly defined goal and do not culminate in the successful accomplishment of a task. Rather, the environment is designed in such a way as to hinder the viewer's progress toward any such goal; for example, the computer will suddenly readjust the configuration of the maze at the moment when the visitor is nearing its exit, or it will shift the output generated by the visitor's movement so that it correlates with horizontal rather than vertical movement of the graphic symbol. In sum, the computer here functions to perturb the natural tendency of the primarily motile visitor to pursue a prescribed goal and thereby to foreground the flexibility and generativity of unreflective, learned social rules against the rigidity of the explicitly coded "if-then," rules governing the operation of computers (as well as the predominant visions of human-computer interface at the time).

As Dinkla puts it, *Psychic Space* "automatizes" socially coded, embodied behavior by prototyping its deployment as a source of creative feedback

for adaptation to constantly changing situations (74). In this way, the environment continually solicits the visitor to affirm her agency, which is to say, the fact that the remapping and extension of *her* movement into this new space is the environment's driving purpose.

Videoplace, Krueger's interactive platform, marks a further and, in some sense, ultimate, stage in the restoration of autonomy to the responsive environment, understood as encompassing—and indeed as the interactional domain structurally coupled to—the embodied visitor. Like *Psychic Space*, *Videoplace* works by capturing an image of the visitor's movement, only in this case the image presents the outline of the visitor's body processed (and distorted in various ways) by the computer. Several different programs facilitate viewer interaction with the schematic traces of her bodily movement; for example, they allow her to fill in the space within the lines with colored images of body parts or to interact with temporally divergent and continually reverberating captures of her movement (see Figure 1.4).

More than anything else, *Videoplace* is differentiated from Krueger's earlier responsive environments by the technical and aesthetic accomplishment of complete action-response synchronicity. Here, the computer does not react to the visitor with a discrete response that in turn triggers an action on the part of the visitor (and so on); rather, because



FIGURE 1.4 Myron Krueger, *Videoplace* (1974–1975), interactive environment/platform, interaction sequence. (Courtesy of the artist.)

the computer's activity—some programmed modification of the data capturing the visitor's movement—coincides absolutely with that movement it becomes (or is experienced as) *an indissociable part of its agency*. This accomplishment of synchronicity shifts the aesthetic interest of the environment from the clarification of the visitor–system correlation (Krueger's guiding concern up to this point) to the newfound capacity for expanded agency:

On account of the synchronicity [of the movement of the video image] with the movement of the [visitor's] body, it is no longer a question of distinguishing between the activity of the system and the activity of the visitor. The computer system's role as interaction partner fades into the background, and it now makes itself available as an instrument [*Instrumentarium*] for the visitor to use. (Dinkla, 82)

The accomplishment of synchronicity is accompanied by a displacement of the artist as programmer and a wholesale inversion of the problematic of simulation. With the shift away from the visitor–system correlation to the action of a now unified single enactive “system-agent,” the function of programming undergoes profound transformation from a close-looped technical element to an open-ended social capability. As Dinkla argues, the environments supported by *Videoplace* are designed “to learn from the visitors.” Krueger's goal, she continues, was “to delegate his role as programmer to the public” (78).

With this shift in aesthetic emphasis comes an equally profound shift in technical emphasis that is definitive for the entire trajectory of media art that I am attempting to sketch here. Rather than calling on the user to adapt to the computer and to learn its language (as is the case with most HCI systems), here the computer is called upon to “learn to understand the natural means of communication” employed by embodied humans: in this case, gestures (Dinkla, 78). It should be clear by now that such “understanding” is the technical and aesthetic precondition for the synchronicity of system and visitor action. Without it, the visitor–system correlation could never move beyond the stage of clarifying exploration; it could never be directed to the world of action and could never become creative in the proper sense.

Thus, *Videoplace* ultimately achieves nothing short of a wholesale humanistic dissolution of the infamous—and for many, highly problematic—Turing test (together with Turing's abstract conception of a general-purpose computing machine). Far from maintaining an emphasis on the behavioral indiscernibility of human and computer

and on the general problem of simulation, *Videoplace* seeks to engineer a human–computer cooperation so seamless that functional synchronicity becomes possible in practice. Put another way, *Videoplace* replaces the observation of behavioral output central to the Turing paradigm of simulation with a functional criterion: the operational “congruence of actions of the user and reactions of the system” (Dinkla, 83). Its purpose is neither epistemological nor ontological—to fool a human observer—but purely functional: to integrate the computer as seamlessly as possible into the motor activity of embodied human agents.

Given *Videoplace*'s eschewal of “visual similarity” as a criterion of function, it is hardly surprising that the payoff of its functional dissolution of the Turing paradigm would be a capacity for coupling motor activity to graphic symbols and effects that bear no direct resemblance to the human body. In this respect, *Videoplace* realizes a degree of flexibility unprecedented in aesthetic mediations of the body (even within Krueger's work): by coupling the motile body with graphic elements that do not visually imitate or simulate it, *Videoplace* opens a disjunction between the body image and the body schema. More exactly, by deploying sensors to capture the movement of the body through a concrete space and in conjunction with a virtual element, it displaces the body image—that is, a predominately visual representation of the body, a primary resemblance—and offers in its place a new, representative but not representational “image,” a graphic symbol that attains its force only through its inclusion within the body schema, through its motor coupling with embodied enactment.

For Dan Cameron, this displacement explains how Krueger is able to bring “a new category of beauty” into the world. By “making the body proprioceptively aware of itself, and of its relation to the artwork and to other viewers,” Krueger manages to “reconfigure” the “representation” of the “human image” in a decisive way (Cameron, 24). In sum, the displacement of the body image by the generative activity of the body schema is what makes Krueger's art so powerful an intervention into digital culture. In stark contrast to the fatalism of critics like Baudrillard and Kittler for whom the abstract generality of digital code marks a fundamental and irremediable departure from the phenomenological ratios governing human experience, Krueger places human embodiment in a position to constrain the “referencelessness of digital code,” thereby installing it as the agent whose action actualizes the (abstract) potential of code.^{vi}

We are now in a position to see why Krueger's work, perhaps more than the work of any other digital artist, exemplifies the twofold movement informing the concept of the "body-in-code." Although Krueger's environments subordinate computer code to the more supple codings of human interaction, thus introducing a significant element of flexibility, they also deploy computer code to trigger or catalyze expansions of embodied agency. On this exemplary model, a body-in-code can be defined as a body whose (still primary) constructive or creative power is expanded through new interactional possibilities offered by the coded programs of "artificial reality."

Because of the way in which it challenges our received conceptions of embodiment—most significantly, by refusing to oppose embodiment to technics and by conjoining the two in a highly productive, functional manner—Krueger's work not only exemplifies the way in which technologies support the world-constituting function of embodiment in the world today, but also urges a fundamental reassessment of phenomenology in light of technics. In so doing, Krueger's work does not so much stand against phenomenology as guide us in the task of assessing the radically creative scope of embodiment in our highly technologized world. Like the art it inspired (directly and indirectly), Krueger's environments give us impetus to challenge the more conservative assumptions informing phenomenology and in this way help to bring out its more radical promise for thinking what I elsewhere call "technical life."

2. BODY SCHEMA AS POTENTIALITY

Notwithstanding the truly disastrous mistranslation of *schema corporel* by "body image," Merleau-Ponty's chapter on "The Spatiality of One's Own Body and Motility" from *The Phenomenology of Perception* offers an account of the body schema as a flexible, plastic, systemic form of distributed agency encompassing what takes place within the boundaries of the body proper (the skin) as well as the entirety of the spatiality of embodied motility. In so doing, as we shall see, Merleau-Ponty opens the possibility of categorically distinguishing the body schema from the body image and thus of putting the former—hitherto a mere object of scientific exploration—to properly philosophical work.

The distinction runs as follows: Whereas the body image characterizes and is generated from a primarily visual apprehension of the body as

an external object, the body schema emerges from what, with autopoietic theory, we have called the operational perspective of the embodied organism. As such, it encompasses an "originary," preobjective process of world constitution that, by giving priority to the internal perspective of the organism, paradoxically includes what is outside its body proper, what lies in the interactional domain specified by embodied enactment. Three important consequences follow from this distinction: first, the body is always in excess over itself; second, this excess involves the body's coupling to an external environment; and third, because such coupling is increasingly accomplished through technical means, this excess (which has certainly always been *potentially* technical) can increasingly be actualized only with the explicit aid of technics.

This means that Merleau-Ponty's phenomenology of embodiment is, from the beginning, a philosophy of embodied technics in which the excess constitutive of embodiment—the horizon of potentiality associated with the body schema—forms a ready conduit for incorporating the technical at the heart of human motility. Accordingly, one of our pressing tasks here will be to think this "originary" technics as it might have been (but was not) developed by Merleau-Ponty, to think this technics beginning from but moving well beyond Merleau-Ponty's limited conception of prosthetics as the extension of bodily habit. In doing so, however, we must never lose sight of the fact that Merleau-Ponty—with the ontological conception of the body schema and its later extension—dissolution in the concept of the flesh—himself gives us the means to do so.

More than any other commentator on the philosopher, Shaun Gallagher emphasizes the centrality of the body schema–body image distinction for Merleau-Ponty's break with "classical" (Husserlian) phenomenology. According to Gallagher, the distinction correlates with the task of thinking "the human body on both sides of the intentional relation"; thus, the body image designates the body as the object or content of intentional (or noetic) consciousness, whereas the body schema characterizes the body as a "prenoetic" function, a kind of infraempirical or sensible–transcendental basis for intentional operation. "In contrast to the intentional (and sometimes conscious) nature of the body image, a *body schema* involves an extraintentional operation carried out prior to or outside of intentional awareness."⁶ More explicitly still,

[It] involves a system of motor capacities, abilities, and habits that enable movement and the maintenance of posture. The body schema

is not a perception, a belief, or an attitude. Rather, it is a system of motor and postural functions that operate below the level of self-referential intentionality, although such functions can enter into and support intentional activity. The preconscious, subpersonal processes carried out by the body-schema system are tacitly keyed into the environment and play a dynamic role in governing posture and movement. Although the body-schema system can have specific effects on cognitive experience, it does not have the status of a conscious representation or belief.⁷

Gallagher goes on to explain how the operations of the body schema “provide specific conditions that constrain perceptual consciousness.” Not only does he thereby situate it as the condition of possibility for phenomenologically accessible experience, but also—more importantly for our purposes—he makes it available as a source for the indirect modification of that experience.

One crucial consequence of Merleau-Ponty’s principled and philosophical distinction between body image and body schema is, as Gallagher points out, a methodological limitation on the phenomenological method: “The preoctic role of the body schema is impenetrable to phenomenological reflection” (233). If this limitation requires a (nonreductive) appeal to the empirical sciences, as Gallagher suggests, it also, more consequentially, marks the operation of a “transcendental sensibility” at the heart of Merleau-Ponty’s phenomenology of embodiment and, specifically, of his concept of the “phenomenal body.”

This is just what is at issue in Merleau-Ponty’s characterization of the body schema as a “law of [the body’s] constitution”: such a characterization is meant to capture the fact that

The spatial and temporal unity, the inter-sensory or the sensorimotor unity of the body is, so to speak, *de jure*, that it is not confined to contents actually and fortuitously associated in the course of experience, that it is in some way *anterior to them and makes their association possible.*⁸

This is equivalent to saying that the motile or “phenomenal” body, the body as body schema, precedes and informs the constitution of the objective domain (including the body as object, or the body image) and the correlative demarcation of the subjective:

Our bodily experience of movement is not a particular case of knowledge; it provides us with a way of access to the world and the object, with a “praktognosia,” which has to be recognized as original and

perhaps as primary. My body has its world, or understands its world, without having to make use of my “symbolic” or “objectifying” function. (140, emphasis added)

Elsewhere, Merleau-Ponty speaks of the body schema as a “system of equivalents,” an “immediately given invariant,” a “general medium for having a world” (141; 146).

This conception of the phenomenal body as a kind of primary access to the world (a world that includes the body) resonates with the privilege of the operational perspective granted the living (human) organism in autopoietic theory. Specifically, it establishes the phenomenal body and its operational perspective, not as a correlate of the objective body and the observational perspective, but rather as the source of both perspectives, indeed of the very possibility of having a perspective as such:

It is not a question of how the soul acts on the objective body, since it is not on the latter that it acts, but on the phenomenal body. So the question has to be reframed, and we must ask why there are two views of me and of my body: my body for me and my body for others, and how these two systems can exist together. It is indeed not enough to say that the objective body belongs to the realm of “for others,” and my phenomenal body to that of “for me,” and we cannot refuse to pose the problem of their relations, *since the “for me” and the “for others” coexist in one and the same world....* (106, emphasis added)

As the primarily active potential that gives the “for me” and the “for others,” the phenomenal body thus constitutes a (preobjective and presubjective) ontological figure that exceeds the scope of the *Phenomenology*’s stated objective of rethinking consciousness through embodiment and consequently anticipates the perspective of Merleau-Ponty’s final ontology of the flesh. Indeed, because of the use to which it puts the scientific concept of the body schema, the phenomenal body comprises something more akin to Massumi’s “body without an image”^{vii} or philosopher José Gil’s “infralinguistic body”^{viii} than to any version of the body image, including the mirror image and the famous “mirror stage.”

Like the body without image and the infralinguistic body, the phenomenal body specifically draws on the intermodal or infraempirical dimension of the body schema, following Henry Head’s original definition, as an unconscious postural model of the body underlying and conditioning exteroceptive sensory experience and preceding the reign, and even the differentiation, of the visual as a distinct (exteroceptive) sense.^{ix}

As Gallagher suggests, the phenomenal body expresses the complexity of the body schema as an intermodal, pre-experiential potentiality:

The body schema consists of certain functions that operate across various parts of a complex system responsible for maintaining posture and governing movement. The first set involves the input and processing of new information about posture and movement that is constantly provided by a number of sources, including proprioception. A second set involves motor habits, learned movement patterns ("motor schemas" or programs). The final set of functions consists of certain intermodal abilities that allow for communication between proprioceptive information and perceptual awareness, and in integration of sensory information and movement. (Gallagher and Cole, 376)

As the expression of the body schema, the phenomenal body fully invests in the ontological power of *proprioception*, as it has been conceptualized generally by recent scientists and philosophers and linked specifically to the body schema.^x

Because it is responsible for linking protosensory bodily sense (proprioception) with perception and motility (and indeed for correlating these latter), the body schema is a source of embodied potential. Such a realization is central to Merleau-Ponty's analysis in the *Phenomenology*; it renders that analysis more interesting and far more continuous with the later ontology of the flesh than even the best of Merleau-Ponty's commentators have been willing to admit.^{xi} The host of functions encompassed in the body schema facilitate what Merleau-Ponty names "potential movement"—that is, the capacity of the normal body to relate simultaneously to a series of potential situations and to exist, in a sense, beyond its actuality, in virtuality. Thus:

Each stimulus applied to the body of the normal person arouses a kind of "potential movement," rather than an actual one; the part of the body in question sheds its anonymity, is revealed, by the presence of a particular tension, as a certain power of action within the framework of the anatomical apparatus. In the case of the normal subject, the body is available not only in real situations into which it is drawn. It can turn aside from the world, apply its activity to stimuli which affect its sensory surfaces, lend itself to experimentation, and generally speaking take its place in the realm of the potential. (108–109)

Merleau-Ponty even goes so far as to associate the normal experience of embodied enaction with a certain actualization of the potential: "The normal person *reckons with* the possible, which thus, without

shifting from its position as a possibility, acquires a sort of actuality" (109). Because of the ontological work performed by the body schema, human beings experience the virtual as a kind of "fringe" of the actual; they "live" the potentiality of their embodiment outside the empirical space of simple actuality.

In an analysis that anticipates and coincides with Gil's treatment of the body as the "spatializer of space," Merleau-Ponty goes on to derive from the ontological dimension of embodied potentiality a conception of movement and, by implication, of space as fundamentally abstract:

Abstract movement carves out within that plenum of the world in which concrete movement took place a zone of reflection and subjectivity; it superimposes upon physical space a virtual or human space. Concrete movement is therefore centripetal whereas abstract movement is centrifugal. The former occurs in the realm of being or of the actual, the latter on the other hand in that of the virtual or the non-existent; the first adheres to a given background, the second throws out its own background. (111)

Its apparent dependence on actual or concrete movement notwithstanding, abstract movement expresses an ontological power—the power of the phenomenal body—that lies at the origin of, and therefore conditions, all concrete spatial experience. In this sense, abstract movement parallels Gil's conception of bodily exfoliation, whereby the body expands its "abstract posture" to occupy concrete space and transform it into abstract space.^{xii} Indeed, Gil's term, "abstract posture," perfectly captures the productive plasticity of the body schema in Merleau-Ponty's analysis because, in both cases, a fundamental dedifferentiation of the boundary separating the body from space, a double invagination of inside and outside, is at issue.

3. TECHNICS AND THE DISSOLUTION OF THE BODY IMAGE

If the key question, as Gil suggests, is the "essential way the body 'turns onto' things," then technics can hardly be excluded from the primary operation of the phenomenal body. Merleau-Ponty seems to grasp this crucial point in his analysis of the blind man's stick. Like the feather in the woman's hat or my unreflective sense of my car's width, the stick does not function as an explicit, cognitively assessable enhancement of the body image, but rather as an immediately practical, unthematizable expansion of the body schema:

The blind man's stick has ceased to be an object for him, and is no longer perceived for itself: its point has become an area of sensitivity, extending the scope and active radius of touch, and providing a parallel to sight. In the exploration of things, the length of the stick does not enter expressly as a middle term: the blind man is rather aware of it through the position of objects than of the position of objects through it. The position of things is immediately given through the extent of the reach which carries him to it, which comprises besides the arm's own reach the stick's range of action.... To get used to a hat, a car or a stick is to be transplanted into them, or conversely, to convert them into the bulk of our own body. (143)

Merleau-Ponty concludes that habit "expresses our power of dilating our being-in-the-world," which today more than ever means "changing our existence by appropriating fresh instruments" (143). Lodged in the "body as mediator of the world," habit comprises a "rearrangement and renewal of the corporeal schema," the "motor grasping of a motor significance" (145/142/143). Importantly, what happens in such schematic rearrangement is a passage between the body proper and the world of things, an increase in power and scope of the body's coupling to (and indifferentiation from) the environment. This is what Gil means when he speaks of the body "turning onto" things: at stake is a "transplantation" of the body into things and an "incorporation" of things into body that, with each new habit and thus each new prosthesis, leaves the boundary between them that much less discrete.

It can hardly come as a surprise, then, that the "general bodily synthesis" carried out by habit perfectly describes, in its function as hinge linking the motor and the perceptual,^{xiii} the accomplishment of human-computer synchronicity in Krueger's *Videoplace*. By transforming the perceptuomotor coupling in a way that is immediate and in a certain sense transparent, Krueger's environment can be said to achieve a bodily synthesis, a "rearrangement and renewal of the corporeal schema" in its motor and its perceptual dimensions. Like Merleau-Ponty's description of the blind man's stick, what is crucial here is the total and seamless integration of the technical element into the perceptuomotor body schema:

But habit does not consist in interpreting the pressures of the stick on the hand as indications of certain positions of the stick, and these as signs of an external object, since it relieves us of the necessity of doing so. The pressures on the hand and the stick are no longer given; the stick is no longer an object perceived by the blind man, but an

instrument with which he perceives. It is a bodily auxiliary, an extension of the bodily synthesis. (152)

Taking up Krueger's project of extending the body schema into the uncharted terrain of "artificial reality," we might well ask what happens when the entirety of the perceptuomotor environment becomes virtual—that is, when the technical extension of the body schema is so massive that it affects every aspect of our access to the world?

In his virtual reality environment, *Traces* (1998–1999), Australian media artist Simon Penny presents us with just such a situation. A project originally designed for networked CAVEs (computer-assisted virtual environments), *Traces* generates a world—that is, a space of sensorimotor interaction—out of the three-dimensional traces of body movement captured by four cameras mounted in the four corners of the CAVE (see Figure 1.5). In this way, it privileges the "bodily, temporal, and kinesthetic sensibilities" of the participant over the illusionism of traditional virtual reality spaces as the vehicle for achieving immersion and the conferral of reality. For Penny, this confrontation with mainstream VR research is necessary to probe

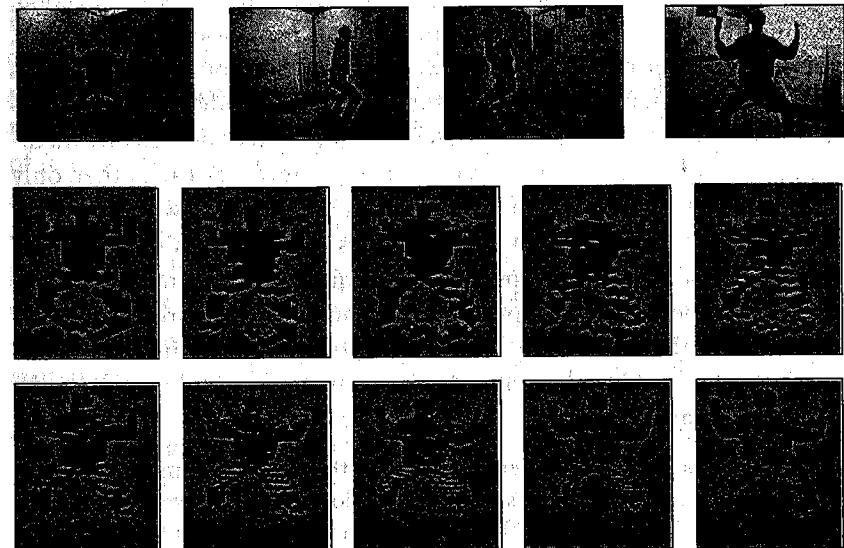


FIGURE 1.5 Simon Penny, *Traces* (1998–1999), networked interactive virtual reality environment. (Courtesy of the artist.)

the promise of new technology and to pinpoint its humanistic basis. As he explains,

Traces is an immersive art project which uses the CAVE stere-immersive environment for an unorthodox purpose. While most virtual worlds are based on a paradigm of virtual navigation through texture mapped worlds, *Traces* has no "world" and no navigation. The aesthetic/theoretical goal of *Traces* is to focus the attention of the user onto their [sic] own sense of embodiment through time. The bodily behavior of the user generates real-time graphics and sound. The technical goal of *Traces* is wireless full-body interaction without the use of standard trackers, joysticks and wands, and without icons, menus or graphical pointers of any kind.⁹

With this nod to Krueger's legacy of "unencumbered VR," Penny forthrightly announces his well-nigh philosophical (indeed properly phenomenological) commitment to constructing virtual reality on the basis of our evolutionarily acquired power of embodiment.

This commitment imposes several constraints that form the very strengths of his project. First, he must eschew the use of illusionist tricks and software tools built according to the simulation paradigm: "Unlike other VR projects, I have no interest here in illusionistic texture mapped models, the illusion of infinite virtual space or building 'virtual worlds.' All attention is focused on the ongoing behavior of the user."¹⁰ Second, he must forego the illusion of proximity in his realization of a telematic, networked experience; unlike the work of Paul Sermon (which achieves telematic copresence through the superposition of video images of participants' bodies), *Traces* emphasizes "the highly technologically mediated nature of the communication. The users never see each other, only the results of each other's behavior. The user interacts with gossamer spatial traces which exhibit the dynamics and volumes of bodies...." (Penny). Finally, and perhaps most consequentially, Penny must move away from the default perspectival interface of VR environments, the reduction of the user's body to a "single point, a viewpoint, or the end of a 'pointer,'" which, he notes, "effectively erases the body from the computational system":

My goal is to build a system with which the user can communicate kinesthetically, where the system comes closer to the native sensibilities of the human, rather than the human being required to adopt a system of abstracted and conventionalized signals (buttons, mouse clicks, command line interface ...) in order to input data to the system. (Penny)

Like Krueger before him, Penny values the evolutionary accomplishment of embodiment and deploys it as the basis of his work and his larger philosophy of mediation.

Unlike Krueger, however, Penny is in a position to benefit from the marked advancement in computer technology that is supporting our seamless entry into an exposed mixed reality environment. (In an email to the author (1/3/06), Penny notes that his vision system was built from the ground up, using a standard desktop computer (a 166 MHz pentium 2), and that it owes its effectiveness to "good, clear design, some very clever coding by Andre [Bernhardt], and very economical video processing solutions." It does, however, take advantage of the technically-advanced CAVE, which ran on "turbocharged" SGI hardware and which formed an enabling background for Penny's bricolage.) Thus, in contrast to Krueger's technically crude, floor-embedded motion sensors, *Traces* uses a sophisticated camera system to "capture the full extent of the user's body as usable input data" (Penny et al.). This difference yields a vast expansion in the scope of what is synchronized with the computer. Now the entire body schema—the coupling of body proper and environment—is generated by the technical system.

One interesting result of this progress, which is indissociably technical and aesthetic, is that synchronicity becomes artifactual—that is, it becomes describable in technical terms and necessarily bound to concrete technical apparatuses.^{xiv} In *Traces*, the artifactuality of synchronicity appears with Penny's strategic gambit (closely related to his repudiation of visual illusionism) to eschew spatial resolution in favor of temporal resolution. At a rate of fifteen captures per second, *Traces* manages to sustain a sensorimotor verisimilitude that is responsible for conferring reality on the wholly *sui-generis* experience it offers. Only present latently in Krueger's *Videoplace*, this explicit temporal threshold comprises the minimal condition on which a technically generated deployment of the body schema can become creative: although "of a low spatial resolution," the real-time body model developed in *Traces* is "of a high temporal resolution" with the result that "the user experiences no 'latency,' or lag, between their [sic] movements and the virtual structures created" (Penny).

Penny's strategic gambit has significance well beyond the *Traces* project. Indeed, it exposes nothing less than the general condition—a minimal temporal threshold—for all technical (re)deployments of the body schema. This condition marks a crucial break with the (restricted)

vision of technics central to Merleau-Ponty's embodied phenomenology. Whereas the blind man's stick merely extends the *spatial* range of the body schema (and of the motor intentionality it yields), *Traces* fundamentally redeploys the body schema—that is, the *temporality* of embodied enactment—toward the purpose of creating a world out of the primary data of bodily motility.

Traces thereby reveals that the power of the body schema to disclose a world—and along with it, the entire ontological register of the “phenomenal” body with its privileged operational standpoint and orientation via *proprioception* and intermodal communication—is a temporal power, or better, a power that can be exercised only within certain temporal boundaries. Because temporal boundaries are necessarily set into place by artifactual technologies—by those technologies that support the being in the world of time today, including the time of consciousness—*Traces* demonstrates that the disclosive power of the body schema is an essentially technical power, that it simply cannot be dissociated from or thought independently of its concrete technical support, and that, in the end, it emerges only through the technology that makes it possible in the first place.

Obviously, such a general condition for the technical (re)deployment of the body schema calls for a more radical thinking of technics than we find in Merleau-Ponty's vision of prosthetics in the *Phenomenology*. Perhaps the best way to capture what is at stake here is to return, briefly, to the relation (and differences) between body image and body schema. Once again, Shaun Gallagher proves an insightful guide insofar as he manages to explain how prosthetics function to disjoin the unconscious body schema from any consciously experienced, intended (or noetic) body image.

When the body does appear in consciousness, it often appears as clearly differentiated from its environment. Body image boundaries tend to be relatively clearly defined. The body schema, in contrast, can be functionally integrated with its environment, even to the extent that it frequently incorporates certain objects into its operations—the hammer in the carpenter's hand, the feather in the woman's hat, and so forth. Under these circumstances one's perception of body boundary may end at one's finger tips even when a particular schema projects itself to include the hammer that one is using. (Gallagher and Cole, 372)

It is interesting that this perceptual differentiation between self-representation

(body image) and enactive spatialization (body schema) *can no longer be made in virtual environments like that of Penny's Traces*. The reason is not simply that the prosthetic function is so fundamental that it has an impact on the visual or representational body image as well as the motile body schema,^{xv} but rather *that the difference between them—and with it, the role of representation—has been entirely effaced*. Put another way, in such environments, whatever experience one has of one's body proper does not take the form of a (representational) image, but rather emerges through the *representative* function of the data of body movement, the way these data (“naturally,” as it were) represent one's body.

The experience of one's body proper is thus given through the *same material* as is one's experience of motility: namely, traces of body movement captured at or above a minimally sufficient temporal speed. Here, then, we encounter a *body-in-code* in a completely literal sense, meaning a body image that is indiscernible from a technically generated body schema. Describing the networked model of his project, Penny perfectly captures this productive technical fusion of image and schema. In the networked *Traces*, he explains:

Each CAVE will use multi-camera machine vision to build real-time body models of participants. These body-models will then be used to generate abstracted graphical bodily traces in the other CAVEs.

If, for instance, three CAVEs are networked, then a participant in CAVE A will interact in real time with image traces of participants in CAVEs B and C. These traces will not ... be accurate sculptural representations but will be used to drive complex algorithmic processes which will give rise to changing 3D graphical traces which indicate the presence, gesture and movement of the remote participants. Hence a person may be represented as a moving ghostlike, transparent and wispy trace. (Penny)

If a similar algorithmic procedure underlies the self-described dimension of “user experience” in the *Traces* system, it not only witnesses the collapse of the body image and body schema, but also exposes this collapse as the condition of possibility for the creative deployment of the technically enactive body schema.

Not surprisingly, the experience proposed by Penny and his collaborators for users of *Traces* is designed specifically to accommodate the gradual adjustment of the body schema to its total technical mediation. A first phase of interaction, “Passive Trace,” places users into feedback with traces that passively follow their movements and

that gradually float and fade away. A second phase, "Active Trace," allows users to build their own structures; still generated as traces of user movement, these traces are amplified by a cellular automaton algorithm that, in the words of the designers, makes them "sparkle." Finally, in a third phase, "Chinese Dragons," the user's movements throw off small abstract creatures (resembling Chinese dragons), which initially maintain the momentum of the movements that generate them but eventually begin to behave autonomously, flying through the space and chasing behind the viewer. (Penny notes in an email (1/3/06) that the "Chinese Dragons" interaction was a very early, if not the first, attempt to utilize basic life behaviors (flocking, etc.) in an immersive interactive 3D context.)

In the passage through these phases, the user's body schema—the means of access to, indeed of production of, this virtual world—undergoes progressive deterritorialization, bringing home the fact that this feedback with the traces of one's bodily movement *is* an enactive representative of the body, *is* the body image. In this scenario, one simply cannot differentiate the boundaries of a body proper from the entire interactional domain generated through bodily movement. The functions informing a consciously experienced body image that would be separate from the interactive coupling of the body schema simply do not apply in this world.

To appreciate this technically facilitated fusion of image and schema, we would do well to follow Alphonso Lingis when he conceives of the body image (in a well-nigh Bergsonian manner) as an "emanation" from the postural (body) schema, rather than a separate and distinct representation of the body. Lingis suggests:

What psychologists have improperly named "body image" is not something projected by an act of imagination when we detach our perception from things; it emanates from the mobilized posture and extends about it. The body in mobilizing into a posture situates the levels where other viewing positions lie and emanates an "image" of itself as something visible, tangible, audible in that space.¹¹

In this respect, the body image is distinctly derivative—it is a minimally distanced (and predominately visual) apprehension of the self, paradigmatically performed by the other, but also, of course, by the self confronting itself, as it were, as an other (that is, from an observational perspective^{xvi}).

This characterization of the body image as an emanation (along with the differentiation of image and schema it supports and derives specifically from Merleau-Ponty) helps to clarify Paul Schilder's claim that we perceive our body image in the same way as others perceive it. For Schilder (the psychologist *par excellence* of the body image and the source for much of Merleau-Ponty's analysis), this is almost an analytical postulate, insofar as it is (or seemed to him to be) necessary to ward off the specter of *Einfühlung* and projective identification:

The perception of the bodies of others and of their expression of emotions is as primary as the perception of our own body and its emotions and expressions. Our own body, as all the previous discussions show, in sensory perception is not different from the sensory perception of the bodies of others.... Just as we have rejected the idea of "*Einfühlung*" we have to reject the idea that we arrive at the knowledge of the bodies of others and their emotions by projecting our body and our feelings into other personalities.... [T]here is a continual interchange between our own body-image and the body-image of others.¹²

Conceiving of the body image (as it is used here) as an emanation from the body schema allows us to grasp the extent of Merleau-Ponty's philosophical break with empirical psychological theory. From his perspective, the noetic, representational body image is a derivative of—an emanation from—a more primitive, prenoetic bodily activity. Although it is true that there is continual interchange between our body image and the body image of others, the reason is far more profound than Schilder imagines. Body images (to the extent they exist as separable representations) enjoy such interchange only because they are emanations of body schemas which operate in a common, intercorporeal interactional domain. The (representational) commonality of the body image is an emanation from the (enactive) commonality of the body schema.

If an appreciation of this profound structure of intercorporeality is missing from Schilder's analysis, the reason is that Schilder lacks any understanding of the operational privilege that defines the phenomenal body on Merleau-Ponty's account. For him, everything takes place at the level of observation, meaning ultimately that he lacks the resources to differentiate embodiment as an ontological operation from its representation in the form of an image. (In this respect, Schilder's theory resonates with the concept of psychastenia that will be central in Chapter 2.) This lack explains Schilder's failure to differentiate the body image

from the body schema in any principled, categorical manner, as well as the waves of confusion that have ensued as this failure was perpetuated by his successors and, in the process, gradually effaced.

Because of its explicit concern for the problematic of perspective, Penny's *Traces* comprises a perfect occasion to confront this confusion and to demonstrate, specifically, how the technical deployment of the body schema makes its exposure all the more urgent. Penny's description of the "user experience" dimension of the project makes clear the centrality—indeed the privilege—accorded the operational perspective in the production and perception of the world and, specifically, of whatever body image it may sustain:

The user enters the CAVE. A small cubic virtual room with an hemispherical dome is rendered exactly onto the walls of the CAVE in simple shading. This enclosure immediately negates the illusion of infinite space found in many virtual worlds. It is a cozy space. As the user moves, volumes appear in the space which are representations of the space passed through by the body parts of the user. These volumes have a life span, they become more transparent over a period of about a minute, then disappear. After a minute or two, another set of volumes appear in the space. These are volumes created by the remote user. Users can create volumes in response to each other. After a while, this volume-building behavior changes. The user can create self-contained floating volumes, blobs or particles. Simultaneously, a small four-paned window appears in the back wall of the CAVE. Beyond this window the user can see another room exactly like the one she is in. In it is a very abstract moving anthropomorphic volume. This is the body model of the remote user, perhaps also with some blobs. The wall between the spaces dissolves, leaving the two users in a longer room. The users find that their blobs can be thrown and have a trajectory. They bounce off the walls. Slowly the blobs or particles begin to have their own dynamic, graphical and acoustic behavior. The particles can traverse the whole space, while the users are confined to their original part. The particles interact with each other with some sort of gravitational behavior. The space becomes populated with swarms of autonomous chattering things. Slowly it becomes more difficult to generate particles, and they die off. Projection intensity dims and the experience is over. (In an email to the author (1/3/06), Penny clarifies that this description belongs to his proposal for the Cyberstar 98 Competition and does not represent the project as realized. It does, however, eloquently, even poetically, express the privilege of the operational perspective that, *willy nilly*, does inform the actual project.)

This third-person description manages to capture the transductive identity between the user's bodily action in the environment and the (algorithmically processed) imaging of the traces of his or her movement. Not only does neither one exist without the other and outside of their relation (the definition of transduction, according to Gilbert Simondon^{xvii}), but also, as the description of the interaction's cessation makes clear, both are wholly dependent on the environment's technical deployment of the body schema—that is, the operational perspective of the user. This is precisely why the artist only discovered the significance of the problematic of perspective during the exhibition of *Traces*. As Penny notes:

An amusing aspect of the graphics development was the transition from the 3rd person view (while developing off-line) to the first person view in the CAVE. Solutions which were very satisfying in the simulation mode were useless in first person. For example, if a person is moving forwards, the trace is developing behind her and she can't see it! Worse, if she moves even a voxel backwards, her head is encased in a form which is the head location at the previous time step, so she can't see anything! (Penny et al., citation modified)

This discovery taught Penny that, at the limit, all descriptions of the environment (including the user's description of her body image within it) depend on (and are subordinate to) the bodily activity of the user. For this reason, it seems, Penny is able to appreciate the significant ergodic dimension of the work, a dimension linked directly to the demands made on the body schema of the user.^{xviii}

4. SPECULARITY BEYOND THE MIRROR-IMAGE

Conceptualizing the body image as an emanation from the body schema asserts the derivative status of the body image (and of the image, per se, as an ontological category^{xix}) and—even more importantly for our present concerns—puts the category of the visual (the "nobility of vision," to use Hans Jonas' felicitous term) into question. I shall return to Jonas' critique of vision in Chapter 2; in the present context, Merleau-Ponty's derivation of vision from touch is my ultimate concern. Indeed, what follows can be understood as an effort to explicate the following passage from one of the most enigmatic but also most pregnant working notes of *The Visible and the Invisible*:

The flesh is a mirror phenomenon and the mirror is an extension of my relation with my body.... To touch oneself, to see oneself, is to obtain ... a specular extract of oneself, i.e. fission of appearance and Being—a fission that already takes place in the touch (duality of the touching and the touched) and which, with the mirror (Narcissus) is only a more profound adhesion to Self.¹³

What is the meaning of this primacy apparently granted touch as the originary source of the fission of Being and its “specular extract”? In what sense can we say that the mirror image, far from being the source of fission, rather belongs to touch, expands its originary self-belonging/ self-differentiating across an essential distance?

Given the correlation of the body schema with the later conception of the flesh^{xx} and the more general continuity it marks between the exploration of the ontological power of the “phenomenal body” in the *Phenomenology* and the later, explicit turn to ontology, we would do well to explore such questions—and the apparent privilege of touch—beginning from Merleau-Ponty’s analysis of child development in his seminar on “The Child’s Relations with Others.” Merleau-Ponty’s analysis in this seminar is guided by his conviction that the child’s visual apprehension of her body—that is, the visual image of the body presented in the mirror, neither exhausts the child’s experience of her body nor directly concerns the ontological dimension of such experience. “The child’s visual experience of his own body is,” Merleau-Ponty observes, “altogether insignificant in relation to the kinesthetic, cenesthesiaic, or tactile feeling he can have of it.”¹⁴

To explain the fact that the child nevertheless does assimilate the visual image of her body to the interoceptive image of it and also, more generally, that she “comes to identify as bodies,” indeed as “animated ones,” her body and the bodies of others, Merleau-Ponty invokes a certain commonality of experience that comes simply from the fact of embodiment: “If I am a consciousness turned toward things [it would be better to say a body turned towards things; MH], I can meet in things the actions of another and find in them a meaning, because they are themes of possible activity for my own body” (117).

Just as this presupposes a “reform” in the notion of the psyche (which can no longer be viewed as something accessible only to myself and not seen from the outside), it also requires a reform in our conception of our body: “If my body is to appropriate the conducts given to me visually and make them its own, it must itself be given to me not as a mass of utterly private sensations but instead by what has been called a ‘postural’

or ‘corporeal’ schema” (117). This capacity is what Henri Wallon calls “a ‘postural impregnation’ of my own body by the conducts I witness”. Thus, explains Merleau-Ponty:

I can perceive, across the visual image of the other, that the other is an organism, that that organism is inhabited by a “psyche,” because the visual image of the other is interpreted by the notion I myself have of my own body and thus appears as the visible envelopment of another “corporeal schema.” (118)^{xxi}

This ontological privileging of the body schema over the visual image of the body ultimately informs Merleau-Ponty’s refunctionalization of Lacan’s famous “mirror stage” and, with it, the entire role of the specular (of which the mirror image is only a particular concrete dimension). Lacan, as is well known, posits the mirror stage—the concrete experience of seeing in the mirror image—as the crucial moment in the complex transition of the infant from a “fragmented body image” into an “orthopaedic” totality.^{xxii} This accomplishment yields a net gain in organization and a concomitant development of the ego (and super-ego); however, it also marks, or at least prefigures, the advent of “paranoic alienation,” the alienation of the imaginary ego that occurs as this latter is “deflect[ed] ... into the social”—that is, subjected to the symbolic order (Lacan, 5). From this point onwards in Lacan’s picture, the subject enters into a perpetual struggle for recognition in the eyes of others, which is equally to say, a struggle against its lack, its dependence on the symbolic, and, finally, its fundamental or essential incompleteness.

In his comments on the specular image and on Lacan’s theory specifically, Merleau-Ponty makes clear the extent of his agreement with Lacan: he too recognizes that self-alienation arises in the passage from the fragmented body to the unified body image, the body image as form or *gestalt*. What distinguishes Merleau-Ponty’s commentary, however, is his effort to understand this alienation, not as an inaugural source of paranoia, but as a productive and ongoing dimension of the phenomenal body—what I have earlier called the *imaging power* of the organism.

Two principles are fundamental in Merleau-Ponty’s analysis—the nonidentity between the interoceptive and the specular and the primacy of the former as the source of their relation. Not surprisingly, these two principles emerge as the “solutions” to two concrete problems faced by the infant as she seeks to understand the discord between her “natural” and necessarily incomplete view of her body and the complete view given by the mirror image^{xxiii}:

It is a problem first of understanding that the visual image of his body which he sees over there in the mirror *is not himself*, since he is not in the mirror but here, where he feels himself; and second, he must understand that, not being located there, in the mirror, but rather where he feels himself interoceptively, he can nonetheless be seen by an external witness *at the very place at which he feels himself to be* and with the same visual appearance that he has from the mirror. In short, he must displace the mirror image, bringing it from the apparent or virtual place it occupies in the depth of the mirror back to himself, whom he identifies *at a distance* with his interoceptive body. (1964, 129, first and last emphases added)

Far from comprising a wholesale displacement of identification from the interoceptive to the specular self and from the body as a “collection of confusedly felt impulses” to the unified body image, the specular image rather marks the advent of a more complex self-relation, one that requires the recognition of a certain doubling of the self and compels a massive spatial extension of the body’s primary tactility.^{xxiv} The child must learn to recognize the specular image “as being of oneself, yet not identical *to* oneself,” to employ the felicitous distinction suggested by feminist philosopher Gail Weiss, and the means to do so is a bodily occupation of the visible, a “touching” across an essential distance.¹⁵

What is at stake in the specular image is, accordingly, less a drama of identification, as Lacan suggests, than a particular stage in a process that is, from the very beginning, defined by schism, “fission,” *écart*. Instead of marking a fundamental trauma that at once or continuously gives birth to the subject (as Lacan, Butler, and a host of feminist critics following in their wake have variously contended), the mirror stage belongs within a broader developmental trajectory and concretely instances the more fundamental experience of essential separation that Merleau-Ponty will increasingly identify with embodied (human) being. With this in mind, it is important to emphasize that, far from occasioning some transcendence of primary tactility (bodily feeling), the mirror stage not only is ontologically rooted in it but also comprises a concrete valence of its power (i.e., imaging power).

Although he insists on situating the schism of the mirror stage as an instance of a broader developmental trajectory of the phenomenal body, Merleau-Ponty is also, like Lacan, keenly attentive to the specific accomplishments, to the well-nigh existential leap, it makes possible. Yet, whereas, for Lacan, the schism yields the fundamental, desire-generating alienation of the specular “I” into the social “I,” for Merleau-Ponty it

allows the child to enter into a space of intercorporeality: “What is true of his own body, for the child, is also true of the other’s body. The child himself feels that he is in the other’s body, just as he feels himself to be in his visual image” (134). For Merleau-Ponty, that is, the specular image and the “gaze of the other” belong together as an integral phenomenon. Far from occasioning paranoiac alienation, then, the specular image facilitates a vast expansion in the child’s embodied agency precisely because it allows the child to enter into the space of the social and into social relations with others. Weiss explains how this happens:

[T]he specular image offers the child a new perspective not only on her/his own body and her/his being-for-others (what we may call an “outside-in” perspective) but simultaneously allows the child to project her/himself outside of her/his body *into* the specular image and, correspondingly, into the bodies of others (an “inside-out” perspective). Although the former may indeed be a source of profound alienation, it is the latter, especially, that provides the ground for strong *identifications with others*, identifications that expand the parameters of the body image and accomplish its transition from an interoceptive, fragmented experience of the body to a social gestalt. In emphasizing the child’s new understanding of visibility and spatiability, Merleau-Ponty displaces Lacan’s emphasis on the temporal conflation of a future, complete “I” with the present incomplete sense of self, a fundamental *méconnaissance* that is, for the latter, the source of deception that provides the necessary basis for the constitution of the “I.” What Merleau-Ponty offers instead is the development of an intracorporeal spatiality accomplished through the mirror stage that provides a more positive and productive account of the formation of the body image (and of the I) as an intersubjective phenomenon that need not be grounded in deception. (13)

For all its keen attention to Merleau-Ponty’s divergence from Lacan, this account fails to capture the essential adherence of the visual image—and the power of imaging as such—to the ontogenesis of the phenomenal body. Put another way, Weiss stops short of carrying the analysis through to its ultimate point (that is, of returning to the origin of intercorporeality: namely, the commonality of the body schema). Following Merleau-Ponty’s initial (previously cited) remarks on the essentially public dimension of embodied life, it is the commonality of the body schema that grounds the incarnation of the distance opened by the mirror image and of the distance separating us from the images of the other’s body.

The commonality of the body schema, in short, produces a form of being-with that is indifferent to its trigger, indifferent to whether it concerns one's mirror image or the image of the other. That this comprises a fundamental, ontological form of being-with is assured by the fact that it precedes the distinction of self and other. It thereby correlates with an account of primary narcissism that, unlike Freud's highly fraught notion,^{xxv} corresponds to the installation of the schism, the *écart*, at the heart of bodily life, prior to its differentiation from an object world.

One crucial consequence of this fundamental domain of being-with is the dedifferentiation of the mirror-image and the image of the other and an ensuing generalization of specularization not simply beyond the visual, but as the very originary basis of all embodied experience. Indeed, this generalized specularity underlies the isomorphism of access to the mirror-image and image of the other in Merleau-Ponty's account of the so-called mirror stage. In both cases, the body schema forms a medium through which the feeling body opens out—exfoliates itself, to recall Gil's term—into the space between it and the image.

This self-exfoliation, this bodily occupation of the distance opened by the visible, brings the image back to the feeling body and, accordingly, makes it more than a mere surface reflection, makes it a true specular image, a true double of the self, and even more generally, an occasion for the *specular* doubling of the body's primary sensibility.^{xxvi} In this sense, the child's experience of his or her mirror-image simply exemplifies a broader experience of specularity, and the integrality or unity of experience that persists across the mirror-stage characterizes embodied life in general, insofar as this is fundamentally split between the tactile and the visual:

In the case of the specular image, instead of a second body which the child would have and which would be located elsewhere than in his tactile body, there is a kind of *identity at a distance*, a *ubiquity* of the body; the body is at once present in the mirror and present at the point of where I feel it tactually. But if this is the case, the two aspects that are to be co-ordinated are not really separated in the child and are in no way separated in the sense in which all objects in space are separated in adult perception.... The reduction to unity is not a cataclysm, if it is true that there is no veritable duplicity or duality between the visual body and the interoceptive body in spite of the phenomenon of distance that separates the image in the mirror from the felt body. (139–140)

If the distance introduced by visual experience does not cleave embodied being in two, that is because the latter's "possession" of the visible through

the body schema itself emerges out of an "originary" installation of schism, of *écart*, at the very heart of being.^{xxvii}

5. ALL EXTERIORIZATIONS ARE EXTERIORIZATIONS OF THE SKIN

If the self-exfoliation of the phenomenal body occasioned by the specular image is a thoroughly technical process, it does not, however, *introduce* technics into embodiment as if for the first time. No more a fall into technics than (*pace* Lacan) a fall into social alienation, worldly specularization merely instances the concrete technical conditions for the phenomenatization of embodiment at any given historical moment in what philosopher Bernard Stiegler has called the history of the supplement.^{xxviii} If there is a history of specularization, that is precisely because embodied life is "essentially" technical, because the generalization of specularity always already implicated in the concrete operation of the body schema finds its enabling, sensible-transcendental or infraempirical condition in the *écart* constitutive of sensibility. We could equally say that technologies are always already embodied, that they are in their own way "essentially" embodied, if by this we mean that they mediate—that they express—the primordial fission, the gap, within the being of the sensible.

Such an understanding of the primordial technicity of life as sensible *écart* resonates in interesting and productive ways with the psychoanalytical conceptions of the skin ego (Didier Anzieu) and the primary, *passive* containing function of the skin (Esther Bick). Part of an effort to unpack the domain of *transcendental sensibility* underlying and conditioning Kleinian object relations, Anzieu and Bick (working simultaneously but separately!) invest the skin as a kind of primary passivity that, long before the advent of the mirror-stage and even before the incorporation of the mother's breast, serves to bind together "parts of the personality not as yet differentiated from parts of the body."¹⁶ "The thesis," explains Bick, "is that in its most primitive form the parts of the personality are felt to have no binding force among themselves and must therefore be held together in a way that is experienced by them passively, by the skin functioning as a boundary" (55). However, she abruptly notes:

This internal function of containing the parts of the self is dependent initially on the introjection of an external object, experienced as capable of fulfilling this function.... Until the containing functions

have been introjected, the concept of a space within the self cannot arise.... The stage of primary splitting and idealization of self and object can now be seen to rest on this earlier process of containment of self and object by their respective "skins." (55–56)

In his commentary on Bick, Anzieu brings out the fundamental differentiation—the presence of a primordial sensory *écart*—that informs Bick's conception of the passive integrating function of the skin:

But this internal function of containing the parts of the Self is dependent initially on the introjection of an external object capable of fulfilling the function. This containing object is usually constituted in the process of feeding [in its dual aspect of nipple in mouth and touching of skin].... The containing object is experienced concretely as skin. If the containing function is introjected, the baby may acquire the concept of a "space within the self" and accede to a splitting of Self and object, each being contained in its respective skin.¹⁷

If we substitute "skin" for "containing object" here, we encounter, in an only apparent tautology, the most fundamental form of the *écart* constitutive of the being of the sensible: "the skin [= introjected containing object] is experienced concretely as skin." In the mode of primary passivity, the infant thus experiences the skin from the "inside" (the feeling of having "a space within the self") *and* from the "outside" (though via the *introjection* of the skin as boundary), as "agent" *and* as "patient." This happens without support from—and thus prior to—the series of differentiations (self-other, inside-outside, psychic space-objective space, etc.) that such experience would seem to require but will in effect performatively produce.

Because of this fundamental, preobjective, prespatial duality or reversibility, the skin constitutes the locus and support for a primordial materialization of the sensible, for the most basic form of the *écart* of the sensible. Recalling our earlier comments on primary narcissism, it is important to emphasize once again (with Merleau-Ponty) that this basic form of *écart*—the skin as the locus and support for primary narcissism—is always already differentiated, but differentiated amodally, prior to sensory differentiation (at a more basic level than the separation of the distinct senses).

As this primordial differentiation of the skin, the sensory *écart* is essentially technical. Viewed from the perspective of the human being of today (the normal adult as it has evolved, genetically and culturally, up to the present), this essential technicity can (perhaps only) be

understood through the trajectory of exteriorization it makes possible and which constitutes the "epiphylogenetic" evolution of the human.^{xxix} It can (perhaps only) be understood, that is, as the sensible-transcendental ground for exteriorization as such.

That is why I have emphasized the coupling of embodiment and technics: the technologies that saturate our contemporary world, in this respect no different from the earliest flint chipping tools used by protohumans, are so many exteriorizations of our fundamental sensory *écart*. What Bick's and (particularly) Anzieu's work on the skin helps us to see, however, is that this epiphylogenesis of the human, its evolution through means other than life, is made possible by the primordial *écart* and, more specifically, by the fundamental anaclitic indifferentiation of the *écart*, its occupation of the cusp between the biological and the psychic *prior to their actual differentiation*.

A concept describing the way that psychic functions "lean on" biological functions (Freud's word is *Anlehnung*, literally "leaning on"), "anaclisis" is central to Freud's conception of psychoanalysis insofar as it depicts the psyche in continuity with the body and with the biological functioning of the organism. If anaclisis is, for Anzieu, arguably the most fundamental principle of the Freudian revolution, this commitment has the effect of making psychic phenomena intrinsically technical or, perhaps more exactly, of rendering the passage to the psychical nothing less than the sensible-transcendental condition for technical exteriorization as a "transcendence" of genetic law.

In contrast to Jean Laplanche, who reserves anaclisis for explaining how organic functions of self-preservation provide a support for sexual drives, Anzieu generalizes its application to the entirety of psychic life: "The psychical apparatus develops through successive stages of breaking with its biological bases, breaks which on the one hand make it possible to escape from biological laws and, on the other, make it necessary to look for an anaclitic relationship of every psychical to a bodily function" (96). As the most diffuse and primitive organic (sensory, or better, protosensory) locus—the locus for the "attachment drive" (following John Bowlby's ethology-inspired broadening of early infant experience beyond the oral phase of the sexual drive)—the skin encompasses the entirety of biological and psychical function, initially (as we have seen) in an undifferentiated state (a state of virtual differentiation). It thereby forms the basis for a conception of the ego, the skin ego, that is far more primitive than Lacan's mirror stage, Winnicott's analysis of the mother's

face, and Klein's introjection, and is primitive, *categorically*, because it designates the (in)differentiation of the psychical and the biological.

Indeed, Anzieu defines the skin ego as a transitional stage *between* the psychical and the biological—the psychic *and* embodied inhabitation of the caesura of their fundamental (dis)juncture. It is a

mental image of which the Ego of the child makes use during the early phases of its development to represent itself as an Ego containing psychical contents, on the basis of its experience of the surface of the body. This corresponds to the moment at which the psychical Ego differentiates itself from the bodily Ego at the operative level while remaining confused with it at the figurative level. (40)

As Victor Tausk's analysis of the "influencing machine" attests,^{xxx} the skin ego comprises a stage in which the operational function of anaclisis is ahead of its properly psychic function—a stage in which the body operates through a fundamental differentiation that it does not yet experience as such. It thus marks the fundamental sense in which, as Freud put it, the ego is "first and foremost a bodily ego," "not merely a surface entity," but "the projection of a surface," the projection of "bodily sensations ... springing from the surface of the body" (Freud, 16).

The skin, in sum, is the most primordial locus and expression of the indifferentiation of the biological and the psychical marked and overcome by the function of anaclisis. That is why it supports the proto-origin of specularity, of self-relation/heterorelation, as the fundamental sensible *écart*. This *écart* is essentially technical because it is the sensible-transcendental condition for all exteriorization. As it is expanded and deepened by Anzieu, the Freudian theory of anaclisis shows that the passage to exteriorization is only possible because of a passage *within* embodied being, the passage opened by anaclisis and the primordial indifference it marks as well as overcomes, indeed marks in the very process of overcoming.

By helping us discover the essential technicity of the skin ego as the primordial support of anaclisis, Anzieu's analysis refunctionalizes Bick's conception of the "second muscular skin," uncovering its non-pathological generality and, more importantly, making it speak to our contemporary technogenesis and the challenges it poses to our efforts to understand our agency in the world today.^{xxxi} From Bick's more narrow clinical perspective, the second muscular skin, or "second-skin formation," occurs when there is a "disturbance in the primal skin function"; in this formation, "dependence on the object is replaced by a

pseudo-independence, by the inappropriate use of certain mental functions, or perhaps innate talents, for the purpose of creating a substitute for this skin container function" (56).

Given our investment in the body schema as the empirical agent of generalized specularity, it is extremely consequential that "this faulty skin-formation produces a general fragility in later integration and organizations. It manifests itself in states of unintegration as distinct from regression involving the most basic types of partial or total unintegration of body, posture, motility, and corresponding functions of mind, particularly communication" (59). Indeed, its correlation with the body schema is so fundamental that Bick is led to characterize it as a "muscular shell" (59).

Clearly discerning the correlation of this second muscular skin with technics—it is variously referred to as a "substitutive prosthesis," an "ersatz muscularity," a "protective prosthesis" (193/195)—Anzieu modifies Bick's theory by proposing a more generalized, normative function of the second-skin formation:

The second muscular skin is abnormally overdeveloped when it has to compensate for a serious insufficiency of the Skin Ego and to fill in the faults, fissures and holes in the first containing skin. Yet everyone needs a second muscular skin, as an *active* protective shield supplementing the *passive* protective shield constituted by the outer layer of a normally constituted Skin Ego. (195, emphasis added)^{xxxii}

Anzieu gives the example of sports and clothing, noting in particular the penchant of patients to protect themselves from psychoanalytic regression through pre- and postsession work-outs. Bearing in mind the technical function of the second muscular skin, however, we might do better to connect it with the specter of "psychasthenia" precisely as it has been linked to contemporary media culture.^{xxxiii} Faced with the assault of media images that aim precisely to "confuse ... the space defined by the coordinates of the organism's own body ... with represented space," it makes perfect sense that the organism would adopt a muscular skin, a protective shield, in order to ward off the dissolution of its identity that comprises the contemporary condition of generalized psychasthenia.

Our discovery of the essential technicity of the skin as the indifferential of the biological and the psychical (as the primordial *écart* of the sensible) allows us to differentiate another genealogy of technics that diverges fundamentally from this muscular model. The muscular apparatus of the generalized second-skin formation is driven by

aggressiveness^{xxxiv}—as is, obviously, the massively predominant view and deployment of technology in our culture; however, the fact that today's technologies are nonetheless exteriorizations of the skin means that, underneath the (still) pathological cathexis of aggressiveness, these technologies are necessarily correlated with the self-preserved, attachment-centered technical genealogy of the skin as primary containing function. Indeed, in light of the anaclitic indifference instantiated by the primary skin function, we can understand the second muscular skin formation as, first and foremost, an expression of the fact—defining a perfectly general technical condition—that *all exteriorizations are exteriorizations of the skin*.

Accordingly, what the psychoanalytic perspective helps us appreciate (and here it supplements phenomenology, as Merleau-Ponty was well aware) is the concrete (infra)empirical operation, in the life of the adult, of the first containing skin. Indeed, the origin of the skin ego, the first containing skin, in the undifferentiated, protosensory *écart* constitutive of the sensible entails its essential withdrawal from phenomenological manifestation. Such a withdrawal characterizes adult life first and foremost only because it is a purely general, sensible-transcendental condition of all life, of life as such.

Confronted with an artwork that expressly stages a regression from the muscular model of media consumption to some kind of (re)inhabitation of the primary skin as the core of our essential technicity, we thus have due cause to be wary, but also to be intrigued. How can a reversal of the phylogenetic trajectory of embodied life ever lead us back to that which is by definition phenomenologically inscrutable?

Describing her computer sound and video installation, *Bodymaps: artifacts of touch* (1996), artist Thecla Schiphorst announces her desire to create a sensory interface with the human capacity for amodal tactility, the operation of which is logically, if not *per force* chronologically and developmentally, prior to the differentiation of the senses (see Figure 1.6). Noting the work's technical infrastructure—its use of “a specially designed sensor surface ... which can detect touch, pressure, and the amount of forced applied” to it—Schiphorst explains its function:

[T]hese sensors lie beneath a white velvet surface upon which is projected images of the artist's body. The surface yearns for contact and touch. Its rule base is complex and subtle, impossible to decode. Its effect is disturbing, erotic, sensual and subjective. The intention of the work is to subvert the visual/objective relationship between the object and the eye, between click and drag, between analysis and



FIGURE 1.6 Thecla Schiphorst, *Bodymaps: artifacts of touch* (1996), computer sound and video installation. (Courtesy of the artist.)

power, to create a relationship between participant and technology that transgresses rules of ownership and objectivity and begs questions of experience, power and being.... The work ... constructs a space inhabited by the body *as mediated by technology*. The *Bodymaps* installation employs electric field sensor technology, in which the viewer's proximity, touch, and gesture evoke moving sound and image responses from the body contained and represented within the installation space. Images of the body ... of the artist ... are projected onto a horizontal planar surface. The opaque projection surface is a container for the body, and is the site and source for the physical and cultural conditions and objects or artifacts which reference this containment. The surface is covered in white velvet creating a sensual and unexpected texture which leaves “traces” of the hand prints that are left behind, creating a relationship to memory, an inability to escape the effects of one's touch. As the viewer places their [sic] hands closer to the surface or skin of the installation, a complex soundscape responds to their proximity and movement. The image shudders. The viewer becomes participant through the sense of touch. There is no escape from entering the “third space” between objective seeing and subjective feeling.... This work invites relationship through an experience grounded in proprioceptive knowledge, skin sense feeling, listening through touching, seeing through hearing, together integrated through attention.¹⁸

Bodymaps assembles all of the topics we have been discussing here—the mirror-image, the image of the other's body, technics, touch, the skin—and configures them so as to underscore the productive potentiality the

body schema offers for *restoring a tactile interface with the world*. The “third space” at issue here is not some intermediate space that somehow splits the difference between operational and observational perspectives, but rather is more like the sensible-transcendental spatiality—the power to spatialize—that Merleau-Ponty, Gil, and Massumi all accord the phenomenal body.

Bodymaps opens such a third space by reversing the psychogenetic process through which the child comes to acquire a normal adult perspective on the world. Accordingly, whereas Bick correlates the development of body schema function with a healthy first containing skin, *Bodymaps* exploits the (relative) primordiality of the body schema within the register of empirical experience (recall its prenoetic dimension) as a means to disempower vision as the dominant sense (a necessary prerequisite) and thereby to create what we might call (thinking of Ong’s “second orality”) a “second primary tactility,” a partial restoration of the primordial dimension of the skin. This is why the work instances the experimental, as Massumi would put it, somewhere in between—that is, *beneath* the division between—the analog and the digital. *Bodymaps* uses technics to “connect and interfuse different spheres of activity on the same operational plane.” Yet, if it thereby creates “startling effects” by “using proprioception as the general plane of cross-referencing,”^{xxxv} it does so in a way that underscores the primordial technicity of embodiment (and the originary embodiment of technics).

Bodymaps, we can now specify, exemplifies the use of technics to expose the originary technical element of being, the *écart* constitutive of the being of the sensible. This technical exposure is accomplished through Schiphorst’s use of technics to set the embodied enactment of the viewer into feedback with its sensible-transcendental grounding. *Bodymaps*, explains Schiphorst, “uses video images of my own body and images of a digital body whose movement is ‘captured’ from my own movement.” It thus uses—indeed *interfaces*—two distinct kinds of image: images of the *body in movement* and images of the *movements of the body*. Schiphorst clarifies her aim here:

I am especially interested in how the knowledge of movement and of the body can affect and inform the design of electronic computer technology and the works created with (or through) that technology. All movement in the video images ... was created from within the body, as was dictated by elemental states such as drowning, floating, shivering, crawling, uncovering, hiding. This technique used

knowledge gained in physical techniques, ... through movement practices and training. (Schiphorst)

By combining these two distinct kinds of movement in a single interactive installation, Schiphorst is able to deploy the tension between two perspectives—the observational and the operational, the “statistical body” and the “incommensurable body”—to catalyze a potentialization of the body rooted in the function of the body schema beyond or beneath vision. As she explains, the “tension between these coexisting polarities or conditions (one imposed from without, and the other mute, subversive, willed from within) construct maps that define the path of possible inhabitable and inhabited regions of body space.”

In this way, *Bodymaps* effects a direct interface not simply with the *image* of the other’s body (which, recall, was sufficient to ground intercorporeality on Merleau-Ponty’s account), but with the *very traces of movement that constitute the direct expression—indeed, the very activity—of other’s body schema*. This has a significant impact on the constitution of intercorporeality because, rather than having to infer the embodiment of the other and fill in or incarnate the visual distance by bringing the image back to the (feeling) body, the embodied viewer here is confronted with the other’s schema directly—that is, *independently of its body image*.

Schiphorst goes so far as to attribute movement—that is, motile *activity*—to the technically inscribed body: thus the viewer, in her vision, “enters the field of consciousness of the body, where the body’s image becomes aware of the viewer’s gaze and physical presence.” A body with such awareness (which can no longer be a mere “consciousness”) can, obviously, no longer be a mere image. What this means is that the normally dominant (the most noble) sense of vision becomes purely instrumental—a mere means to a deeper, fundamentally tactile and proprioceptive (which is to say, amodal) interface; vision is bypassed as (an essential dimension of) the constitution of (inter)corporeality *qua* generalized and common medium. That is why *Bodymaps* can aptly be described as a “tactile dialogue with the image.”^{xxxvi,19}

6. PRIMORDIAL TACTILITY

Bodymaps exemplifies the capacity of tactility to effectuate the concrete potentialization of the body schema—the becoming-common of the

phenomenal body. What exactly is it about tactility that allows it to be the medium (and not simply the privileged sense, that is, one sense among others) for the partial regression back to the primordial skin formation as concrete, *infraempirical* operator of the *écart* of the sensible? The answer to this question will come in the wake of yet another differentiation, one which is, from the (infra)empirical perspective, opened by the sensible-transcendental *écart*, certainly the most fundamental of all: namely, the differentiation of touch as a distinct sense from touch as a protosensory (amodal) power, of touch proper from primordial tactility.

In his development of the skin ego as the “agent” of a generalized anacisis, Anzieu privileges the tactile precisely as the point of oscillation, the pivot, between the sensible-transcendental *écart* and the infraempirical ground of experience:

In relation to all the other sensory registers, the tactile possesses a distinctive characteristic which not only places it at the origin of the psyche, but allows it permanently to provide the latter with something which one might also call the mental background. This is the backdrop against which psychical contents [*contentus*] stand out as figures; or alternatively the containing envelope which makes it possible for the psychical apparatus to have contents. (84)

In this figuration, the tactile comprises the modality for the reversibility of psychic life, for a higher order reversibility grounded in the primordial anacritic indifference of the skin. Yet, to function as a kind of privileged *über*-sense, an “infrasensory sense,” the tactile must continue to harbor something of the more primordial skin container function. Thus, tactility is at once the most primitive sense formation *and* the sensible-transcendental origin of the sensible *per se*; it must simultaneously instance two divergent ontological formations and must also bridge the gap between them, forming some kind of passage across the empirical-transcendental divide.

This is precisely why Anzieu furnishes two apparently incompatible accounts of the tactile, both of which, however, serve to foreground the reflexivity of sense. On one hand, there is the reflexivity of touch as a distinct sense:

The skin possesses a structural primacy over all the other senses and this is true for at least three reasons. Firstly, it is the only sense organ that covers the whole body. It itself also contains several distinct senses (heat, pain, contact, pressure ...) whose physical proximity entails psychical contiguity. Lastly, as Freud allusively remarks (1923), touch is the only one of the five external senses which possesses a reflexive structure: the child who touches the parts of its body with its

finger is testing our two complementary sensation[s], of being a piece of skin that touches at the same time as being a piece of skin that is touched. It is on the model of tactile reflexivity that the other sensory reflexivities (hearing oneself make sounds, smelling one's own odor, looking at oneself in the mirror), and subsequently the reflexivity of thinking, are constructed. (61)

On the other hand, there is the protoreflexivity—the protoreversibility—of the primordial skin, which only gradually gives rise to the sensible as a differentiated field structured above all through sensory doubleness or reversibility:

The skin, which is a system of several sense organs (perceiving touch, pressure, pain, heat) is itself closely connected with the other organs of external sense (hearing, sight, smell, taste) and with the awareness of body movement and balance. In small babies, the complex sensitivity of the epidermis (to touch, heat and pain) remains for a long time diffuse and undifferentiated. Subsequently, however, it transforms the organism into a sensitive system that is capable of experiencing other sensations of the skin (the associative function) or differentiating them and localizing them as figures emerging against the background of the overall body surface (the screen function). (14)

Rather than relating to each other as abstract transcendental condition and organ of possible experience, as they would on a Kantian approach, these two determinations demonstrate how tactility—primordial tactility—forms the sensible-transcendental condition of its sensory function, how it, in effect, bootstraps itself into experience. This is what I mean by “primordial tactility,” and, given the peculiar dissolution of the empirical-transcendental divide it performs, it is entirely fitting that it has, as its distinct phenomenality, the intersensorial domain normally experienced only by synaesthetes and very young infants, but that, as Brian Massumi has shown, every so often ruptures the smooth fabric of the actual, thus reminding us of its constitutive coupling to the virtual.

Anzieu, for his part, unpacks the psycho-physio-genetic basis of the so-called “fringe of the virtual,” thereby tracing the manifest privilege that touch enjoys in empirical life directly and irrevocably back to the anacritic function of the skin:

The Skin Ego is a psychical surface which connects up sensations of various sorts and makes them stand out as figures against the original background formed by the tactile envelope: this is the Skin Ego's function of *intersensoriality*, which leads to the creation of a 'common sense ... whose basic reference is always to the sense of touch. (103)

What is decisive about Anzieu's contribution here is his insistence on the necessary integration of primary tactility as the medium of the amodal. Far from a hidden transcendental cause, primary tactility is necessarily at work *in every sensory event*; as the source for the differentiation of the senses, it is also the glue that gathers them into a system, the system of the sensible:

[T]he repressed primary tactile communications are not destroyed (except in pathological cases), but are preserved as a backcloth upon which systems of intersensory correspondences come to be inscribed; they constitute a primary psychical space, into which other sensory and motor spaces may be fitted; they provide an imaginary surface upon which the products of later operations of thought may be set out. Communication at a distance through gestures and subsequently by the spoken word requires not only the acquisition of specific codes, but also the preservation of this original echotactile backcloth to communication, and its more or less frequent reactivation and reuse. (152–153)

Anzieu's insistence here allows us to demarcate a domain of the infraempirical more primordial than the *infralanguage* (Gil): namely, the *infratactile* or *infratactility*. "Echotactile communication," he tells us, "remains the original source of semiosis," which means that primordial tactility—*infratactility*—demarcates a prelinguistic domain and function beneath the operation of the *infralanguage*. The latter, accordingly, can be no more than a metaphoric extension or transformation (rather than the sensible-transcendental source of metaphor). "Feedback loops with the environment" are formed very early in the infant's development, insists Anzieu: These are audio-phonological in nature; they relate to crying in the first instance and then to vocalizations ... and are the first stages in the acquisition of semiotic behavior. In other words, *the acquisition of pre-linguistic signification* (of crying and then of sounds during babbling) *precedes the acquisition of infralinguistic signification* (of mimicry and gesture) (165, emphasis added).

Recognizing that chronological succession need not imply structural derivation, we can nonetheless affirm Anzieu's insistence here for the precise reason that it follows directly from the generalization of the anaditic function by which, as we have seen, the sensible is revealed to have always already been *spécular*—that is, constituted on the basis of a fundamental *écart*. For its part, the derivation of language (and of the *infralanguage*) from a more primordial *infratactility* supports the reciprocal coupling of embodiment and technics that we have located

at the heart of the sensible. If language is a specification of technics, a historicotechnical specification of *differance* (as Stiegler puts it), then it is only fitting that it emerge from out of the *infratactile*, the protodifference of the sensible.

7. SEEING THROUGH THE HAND

As a premodal or amodal dimension of the infraempirical that bootstraps itself into phenomenological existence, primary tactility or *infratactility* comprises a kind of primitive or not yet differentiated, virtual, or potential reversibility out of which arises not simply the division of the senses, but more fundamentally, the divisions that comprise *sensation per se* (activity-passivity, experiencing-experienced, subject-object, etc.). *Infratactility* would thus seem to furnish a source for the reversibility that, according to Merleau-Ponty's famous analysis of the chiasm, characterizes the "flesh." Indeed, it helps us to understand the apparent inconsistency in Merleau-Ponty's conception of reversibility, its teetering in the balance between something that cannot quite occur in fact and yet must, by right, be possible:

To begin with, we spoke summarily of a reversibility of the seeing and the visible, of the touching and the touched. It is time to emphasize that it is a reversibility *always imminent and never realized in fact*. My left hand is always on the verge of touching my right hand touching the things, but I never reach coincidence; the coincidence eclipses at the moment of realization, and one of two things always occurs: either my right hand really passes over to the rank of the touched, but then its hold on the world is interrupted; or it retains its hold on the world, but then I do not really touch *it*—my right hand touching, I palpate with my left hand only its outer covering. (1968, 147–48)

By what right, however, is the reversibility always imminent? What agency, what materiality, what form of being supports this imminence? This is a crucial question precisely because it foregrounds the divide separating the phenomenal domain, in which reversibility occurs as the experience of "double sensation," from the infraempirical domain, where reversibility remains *in potentia*.

If we follow Merleau-Ponty in making the move from imminence to double sensation as *experienced*, we obtain a certain conceptualization of the *écart* (the "fission," "gap," or "spread") constitutive of sensation. Specifically, the *écart* would seem to comprise the fundamental principle

of the body's belongingness to the world (and of the complementarity of phenomenization and ontology):

But this incessant escaping, this impotency to superpose exactly upon one another the touching of the things by my right hand and the touching of this same right hand by my left hand, or to superpose, in the exploratory movements of the hand, the tactile experience of a point and that of the "same" point a moment later, or the auditory experience of my own voice and that of other voices—this is not a failure. For if these experiences never exactly overlap, if they slip away at the very moment they are about to rejoin, if there is always a "shift," a "spread" [écart], between them, this is precisely because my two hands are part of the same body, because it moves itself in the world, because I hear myself both from within and from without. I experience—and as often as I wish—the transition and the metamorphosis of the one experience into the other, and it is only as though the hinge between them, solid, unshakeable, remained irremediably hidden from me. But this hiatus between my right hand touched and my right hand touching, between my voice heard and my voice uttered, between one moment of my tactile life and the following one, is not an ontological void, a non-being: it is spanned by the total being of my body and by that of the world.... (148)

The *écart* in this sense is a marker of reversibility as a necessary condition of phenomenal experience, of sensation *per se*. It is nothing other than the fundamental dehiscence that explains the body's need for the world (and also the world's need for the body, being's need for manifestation or phenomenization). As such, *écart* also prevents the body from achieving pure immanence; it is that which renders it an essentially incomplete "unity;" a process of individuation that will never be fully accomplished.

The necessity for such an understanding of the body-world coupling and of its rootedness in the *experience* of the *écart* has been demonstrated by Renaud Barthes in *The Being of the Phenomenon*. The divergence between touching and touched is the condition for the being of the tangible world (and something similar can be said for vision and for hearing—that is, those other senses characterized by doubleness):

[T]he touch is produced only insofar as it is immersed in a body; it advents only as this very corporeality. The touch is itself, that is, sentient, only to the degree that it is unaware of itself in or as the world that it reaches. The incarnation of touch corresponds to the fact that its object is not clearly laid out in front of it but is given only as the obscure presence of a tactile world, the presentation *as* tactile world of a dimension that is non-presentable by itself. The absence of this

dimension to the world responds to the absence of touch to itself, that is, to its carnal being.... touch can proceed only from a subject which is its own absence; which is outside of itself.^{xxxvii,20}

This understanding of the necessary correlation of body and world—and thus of the *écart*—as a function of the reciprocal impossibility of pure reflexivity and pure corporeity goes together (at least on Barthes's account) with a privileging of vision as the most noble of the senses. Indeed, Barthes begins his reconstruction of *The Visible and the Invisible* by positing the "primacy of vision." He claims:

Vision alone gives us access to the world as world.... In hearing or touch, the object does not have access to this exteriety and autonomy: in touch, occurring through physical contact, the thing is experienced "at the tips of the fingers" rather than outside of the one sensing, and I hear the sound "in the ear" rather than situating it in space. In the two cases, the perceiving body is referred back to itself; it fails to forget itself in favor of a pure exteriety. (149)

Things are otherwise in the case of vision: "there is," claims Barthes, "'more world' in vision, since the sensed is given vision only as split off from sensibility, as resting in itself." (149)

As compelling as such an analysis would appear to be, it does not fully accord with the role Merleau-Ponty assigns touch—or, rather, the double sensation of tactility—in some of the final working notes included in *The Visible and the Invisible*. Thus, despite his insistence that vision and touch are fundamentally divergent, that they disclose or construct distinct, *nonsuperposable* universes, Merleau-Ponty accords to both an irreducible openness, a fundamental access, to the world as world:

To touch *oneself*, to see *oneself* ... is not to apprehend oneself as an object, it is to be open to oneself, destined to oneself (narcissism) Nor, therefore, is it to reach *oneself*, it is on the contrary to escape *oneself*, to be ignorant of *oneself*, the self in question is by divergence (*d'écart*), is *Unverborgenheit* of the *Verborgen* as such, which consequently does not cease to be hidden or latent. (249)

In both cases, moreover, this openness or access to world as world emerges because of the asymmetry that lies at the heart of the reversibility constitutive of double sensation. That is why the *écart* is the condition for the transduction of body and world that informs Merleau-Ponty's conception of the flesh. "In fact," continues the same working note:

I do not entirely succeed in touching myself touching, in seeing myself seeing, the experience I have of myself perceiving does not go

beyond a sort of *imminence*, it terminates in the invisible; simply this invisible is *its* invisible, i.e., the reverse of *its* specular perception, of the concrete vision I have of my body in the mirror. The self-perception is still a perception, i.e., it gives me a *Nicht Urpräsentierbar* (a non-visible, myself), but this it gives me through an *Urpräsentierbar* (my tactile or visual appearance) in transparency (i.e., as a latency). (249–50)

In a yet more radical reflection on the transduction of body and world, Merleau-Ponty clearly positions the *écart* constitutive of touch, the *écart* between the touched and the touching, as the source for the opening of the world, for the “untouchable,” and, by extension, for the “invisible”:

To touch and to touch oneself (to touch oneself = touched-touching) They do not coincide in the body: the touching is never exactly the touched. This does not mean that they coincide “in the mind” or at the level of “consciousness.” Something else than the body is needed for the junction to be made: it takes place in the *untouchable*. That of the other which I will never touch. (254)

In this further rumination on the *imminence* of the reversibility of double sensation, Merleau-Ponty lays bare the true *ontological* basis for the failure of the body to coincide with itself: Noncoincidence or “embodied alterity” is simply a primary condition of the being of the body. This ontological fact is precisely what makes the body part of the flesh and also, of course, what grounds the body’s self-transcendence, its fundamental adherence to the world. Beneath the reciprocity of pure reflexivity and pure corporeity, activity and passivity, consciousness and matter, lies the primordial *écart* of tactility which, as Merleau-Ponty’s descriptions attest, must be understood as a first (and “originary”) embrace of alterity, “an original of the elsewhere, a *Selbst* that is an Other” (254).

The fundamental self-alterity of the body goes together with a triangulation of self, things, and world, and it informs a primordial negativity of tactility, or put otherwise, tactility as the source of the body’s negativity (and hence of its transcendence in immanence, its self-transcendence toward the world):

To touch is to touch oneself. To be understood as: the things are the prolongation of my body and my body is the prolongation of the world, through it the world surrounds me—if I cannot touch my own movement, this movement is entirely woven out of contacts with me—The touching oneself and the touching have to be understood as each

the reverse of the other—The negativity that inhabits the touch (and which I must not minimize: it is because of it that the body is not an empirical fact, that it has ontological signification) ... is the *other side* or the *reverse* (or the other dimensionality) of sensible Being.... (255)

This ontological signification of the body explains why the radicalization of the body-world transduction that is constitutive of the flesh—which is also a radicalization of the *écart*—coincides with a passage back from the phenomenal domain of sensory separation (common sense) to the infraempirical domain. As the protodivision of primary tactility, the *écart* generates a protoreversibility—a reversibility prior to and independent of any actual terms to be reversed—that forms the sensible-transcendental condition for sensation.

In the wake of this radicalization of the flesh and of the *écart* of primary tactility, Merleau-Ponty is led to abandon the parallelism of touch and vision that holds sway throughout the chapter on the chiasm and the working notes directly related to it. Although this appears only by implication in the working notes, it emerges as a decisive motif of Merleau-Ponty’s exploration of the human body in the third and final lecture course on *Nature*. What is firmly established in the working notes, however, is the derivation of vision from tactility on which the lectures build.

Thus, for example, we see Merleau-Ponty continuing the same note just cited (and cited earlier at the beginning of Section 5) by correlating vision with touch (or better, with tactility as the agent of embodied self-affectivity). He observes:

The flesh is a *mirror phenomenon* and the mirror is an extension of my relation with my body. Mirror = realization of a *Bild* of the thing, and I-my shadow relation = realization of a (verbal) *Wesen*: extraction of the essence of the thing, of the pellicle of Being or of its “Appearance”—To touch oneself, to see oneself, is to obtain such a specular extract of oneself. I.e. fission of appearance and Being—a fission that already takes place in the touch (duality of the touching and the touched) and which, with the mirror (*Narcissus*) is only a more profound adhesion to Self. (255–256, some emphases added)

We can now understand this passage in its full profundity: it expresses the rootedness of touch and vision as differentiated (and nonoverlapping) senses from a more primordial self-relation of the body that is at the same time (because of its noncoincidence) a self-transcendence: primary tactility.

In *Nature*, the double sensation of touch is explicitly accorded the ontological task of opening the body onto the world, and vision is explicitly positioned as a (higher order) derivation from it. What emerges as the crucial component of this more profound understanding of tactility is the demarcation of a bodily interiority, which is certainly significant in light of our previous exposure of the correlation of the skin boundary and primary tactility. Asking how the body can “have a reference to something other than itself,” Merleau-Ponty quickly comes to what is distinctive about tactility: its boundedness “within” the body:

It [the body] is open in a circuit with the world, but it is open. It sees itself; it touches itself. The hand that I touch, I sense, could touch that which touches it. And this is no longer true past the limits of my skin. The block of my body thus has an “interior” which is its application to itself. By this application, it has not only affective states closed on itself, but also correlations [?—the sensibles and the world. The flesh (the touching touched, as an innate body) as the visibility of the invisible (the touching hand, the look).²¹

This delimitation of a bodily interiority and a skin boundary comprises the payoff of Merleau-Ponty’s deepening of the *Phenomenology*’s analysis of the body as our access to the world as such. To say that the body is “the measurement of the world” or a “standard of things” is, simply, to recognize that its specificity, its singularity, as a kind of being (and as a part of Being) comes from its interiority, from its application to itself (its self-affection), which is, simultaneously, the agency for its openness to the world (hetero-affectivity). This complex self-relation, moreover, informs the duality of sensation characteristic of touch and vision as differentiated (nonoverlapping) senses.

Thus, when Merleau-Ponty discovers the condition of possibility for the duality of sensation “in the relation of the body to itself,” noting that “it is here that there is the touched-touching,” he is simply unpacking the significance of primary tactility’s role as the strict correlative to the skin boundary and the primordial interiority it demarcates (223). Primary tactility is that in virtue of which sensory reciprocity can “break down” or “collapse”; it is the source of the “identity of touching and touched” that, as the analysis from *The Visible and the Invisible* made clear, can never appear in actuality, in the realm of empirical life, even as it expresses the ontological principle of bodily life as fundamentally noncoincident with itself, as sundered by its essential openness to the world.

In *Nature*, Merleau-Ponty explicitly recognizes the asymmetry between touch and vision and the resultant need to modify this understanding if it is to fit the case of vision. If this recognition marks a break with the procedure of *The Visible and the Invisible*, that is precisely because it makes way for an introduction of technicity into the heart of the flesh (the being of the sensible). For what now becomes distinctive about vision is its explicit dependence on a technical artifact, as Merleau-Ponty’s analysis makes clear:

This [“that-is-openness to things” constitutive of the flesh] has been analyzed in the order of touching—there would be changes to make in order to apply this to vision. The eye cannot see the eye as the hand touches the other hand; it can be seen only in a mirror. The gap is larger between the seeing and the seen than between the touching and the touched. A segment of the invisible is encrusted between the eye and itself as a thing. It is maybe only in the other that I see the eye, and this meditation means that the eye is above all seeing, much more seeing than seen, a more subtle flesh, more nervous. But if it were not visible, it would not see, because it would not be a point of view, it would not have planes, depths, orientation.... (223–224)

Vision, in other words, is of a different nature than touch, and this difference is captured by the fact that vision requires a technical artifact—the mirror—in order to attain the reflexivity that is, on Merleau-Ponty’s understanding, characteristic of sensation. Recalling (from our earlier analysis of “The Child’s Relations with Others”) that the mirror image cannot be equated with the specular image, we can now appreciate the derivative nature of vision *and of the mirror as a technical mediation of sensation*. Because of its dependence on the technical artifact (the mirror), vision cannot be originary; indeed, the passage from touch (as a distinct sense) to vision represents a concrete exteriorization (and a technical artifactualization) of the specular whose initial, more primary phenomenization occurs as and in the duality of embodied self-relation (touched-touching). In a certain sense, we can say that the mirror takes the place of the embodied hand, with all the modifications attendant upon this shift, of which the most important is certainly the fact that reciprocity is no longer embodied as interiority, but rather supported by the gaze of the other.

If touch maintains a privileged relation with primordial tactility, that is precisely because the specific reciprocity it involves remains *within* the body (even when the body is extended through prostheses, at least of the sort Merleau-Ponty envisions and discusses). In a sense,

the experience of collapse, the “kaleidoscopic change” that ensues as the moment of identity approaches, harbors within itself some trace of the primordial *écart* of the sensible, of the reciprocity constitutive of primordial tactility. As if in direct proportion to its disenfranchisement within ordinary (adult) perception, touch would seem to enjoy an immediacy, a unity, that owes more to bodily interiority than to the body’s coupling to a world: “Touching immediately touches itself (the ‘bipolarity’ of the *Tastwelt*).” By contrast, “vision breaks this immediate (the visible at a distance, outside the limits of my body) and reestablishes the unity by the mirror, in the world” (278).

The passage from touch to vision is, for all that, less of a shift from one to another sense than a complexification of sensation that inaugurates vision *at the same time as* it extends the scope of touch. That is how Merleau-Ponty explains the “captation of the tactile body by the visual image.” Addressing Paul Schilder’s example of my sensing the contact of my pipe in my hand in the mirror, Merleau-Ponty speculates on the

place of the imaginary of seeing: By seeing and its tactile equivalents, the inauguration of an inside and an outside and their exchanges, of a relation of being to what is however forever outside: The spatiality of the body is an encrustation in the space of the world (I find my hand starting from its place in the world, not starting from the axis of coordinates of my body...). (278)

In effect, the coordination of vision and touch expands the *Tastwelt* so that my hand gives access to a felt space there where it is, with this space becoming incorporated as part of the reciprocity of touch. In so doing, this coordination facilitates the construction of situation-specific boundaries between inside and outside that need not coincide with the skin and that, accordingly, open the body to technical expansion.

Yet, if the body can be thus opened to technical expansion—whether via the mirror of specular vision or the expanded *Tastwelt* of what (with Massumi) we might call “movement-vision”—it is only because embodiment is essentially and originally technical. To see why, we have only to pass from the correlation-in-fact between touch and vision (which institutes an empirical technicity) to their correlation-in-principle (which entails an originary technicity). In the wake of such a passage, we begin to see that the transductive correlation of touching–touched and seeing rests upon a yet more primordial transduction, a transduction that, for

the human as form of life, is entirely originary: the transduction of the *écart* as condition of embodiment and as source for the technical.

Embodiment and technicity thus comprise two divergent, yet entirely complementary (indeed, strictly correlated) expressions of the negativity of (human) being as Merleau-Ponty understands it. If neither one is the cause of the other (which is just what transduction here means), then neither one can be understood as a fall or a contamination (or even a humanization) of the other, as traditional and (now) posthumanist accounts would, variously, have it. Indeed, they each occasion an originary form of transcendence and thus, together, furnish the (double) condition for the emergence of the human as a form of life—that is, as “sensing sensible,” that part of the flesh endowed with “*Empfindbarkeit*,” the capacity to sense (224).

Although the shift to vision may in fact expose the essential technicity of being in a particularly clear manner, it manifestly does not inaugurate that technicity. This is crucial if we are to grasp the correlation of embodiment and technicity in its full originity. Along with embodiment, technicity is there from the origin (which is equally to say that it inhabits primordial tactility) and, like embodiment, is a dimension of the essential specularity of the sensible being of the flesh. That is why the strict correlation of the two distinct, empirical senses of vision and touch comprises nothing other than a manifestation of this originary correlation. As a being conditioned by the transduction of embodiment and technicity, by the double *écart* of primordial tactility, the human is and will always remain split, inhabiting the two separate, incompossible yet superposed worlds of the tactile and the visual.

Only because humans are embodied beings are they able to conjoin these divergent worlds of sense: embodiment is the condition for a phenomenization of being (for a form of the living) that emerges in the gap between touch and vision. Here, then, is the deep reason why we must not simply oppose touch and vision, but rather must attempt to think their transduction and, most crucially, must assume the consequences of its emergence out of the originary transduction of the *écart* as condition of embodiment and source for the technical.

For if vision does mark a massive expansion of exteriorization, we must remember that it does so not by breaking with touch, but rather by extending touch beyond the boundary of the skin. Likewise, if touch gives rise to interiority, it also—and for this very reason—inaugurates the relation to the outside constitutive for all exteriorization. To say

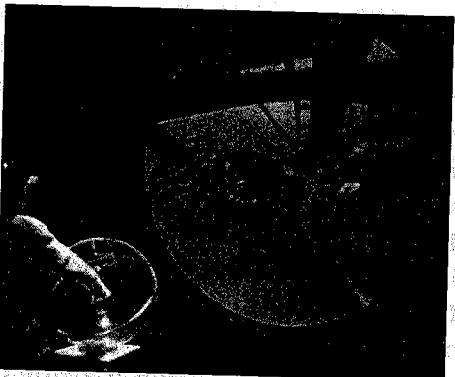


FIGURE 1.7 Agnes Hegedüs, *Hindsight* (1992), interactive virtual reality interface system. (Courtesy of the artist.)

that the human is split between the tactile and the visual is, in a certain sense, to say that the human is, from its origin, embodied *and* technical; the proto-origin of tactility and vision is the *écart*, the hinge or gap in which embodiment is conjoined with technicity, interiority with exteriorization.

As the compression of its title announces, Agnes Hegedüs's *Hindsight* (1992) proffers a performative allegory of this transductive coupling of vision and touch. *Hindsight* comprises three separate elements: a hand-held "eyeball" interface that tracks hand position; a transparent sphere with an iris-shaped opening for the hand; and a round projection screen, initially displaying an image of an eye, that opens into a virtual world. Functioning as a single, integrated visual system, *Hindsight* requires the viewer to initiate and control the operation of vision through the hand; only by manipulating the eyeball interface within the transparent sphere is the viewer able to access the virtual world projected in the eye-shaped screen on the wall in front of him or her (see Figure 1.7).

By routing the function of vision through the instrumentality of manual manipulation, Hegedüs compels the viewer-user of her work to see with the hand, thus foregrounding—in a particularly enactive way—the presence of tactility in vision. And by coupling this form of tactile vision with the virtual, Hegedüs displaces the focus from the differences and similarities between the physical and the virtual worlds, revealing instead how the virtual comprises an extension of the essential technicity of embodied life. If the work carries out “the reembodiment of the senses,” as Hegedüs contends, the reason has everything to do

with the transductive coupling of vision and touch.²² *Hindsight* is able directly to map virtual vision on tactility precisely because it channels vision through an interface—the tactilely manipulable eyeball—that correlates to a visual point of view *within* the virtual world it views. “Hand motions,” explains Hegedüs, “are translated instantly (i.e., in ‘real time’) into a moving-point-of-view like an ‘endoscopic eye’ (*endo*—within, e.g., capable of penetrating an interior space) exploring a virtual world.”²³ The sphere (and the work as such) ultimately provides the viewer “an endo-spatial enclosure whose manual exploration maps directly into the representation of the virtual domain” (Hegedüs, “*Hindsight*”).

Coupled in this way with “the endo-spatial enclosure,” the virtual is positioned as the payoff, not of some autonomous technical accomplishment (as so many recent discussions seem to maintain), but rather of the transductive coupling of vision and touch. If the virtual here comprises a deterritorialization of the visual via its exteriorization of the body’s interiority, like vision, it is deeply bound up with embodiment. Indeed, the virtual is less a new domain of vision proper than a technical extension of sensation that serves to expose tactility’s role in inaugurating the coupling of interiority and exteriorization and, with it, the essential technicity of sensation.

What the work exteriorizes, then, is not some autonomous domain of the visual, but, as Hegedüs insists, the domain of interiority: the work transforms “an ordinarily inaccessible interiority or psychic space of transcendence … into an externalized virtual space that can be entered and explored” (Hegedüs, [Description]). Given our earlier discussion of the transduction of interiority and exteriorization, it is interesting that this passage to exteriorization is doubled by the inverse movement, as Anne-Marie Duguet explains:

[T]he eye, an object in the exterior, becomes a detecting subject in the interior of the sphere where it executes the points of view that are given to it by the hand. One is thus confronted with an extraordinary mobility and instability of the look; the scene regresses [*se retourne*] to a simple game of digits, the objects turn around and traverse one another without resistance.²⁴

Duguet’s analysis helps to underscore how *Hindsight*, by making the hand into the operator of the eye’s movement, introduces a distancing into tactility and thus allows reflection on the transduction—and perhaps, ultimately, on the indifferentiation—between tactility and vision.

In the end, *Hindsight* works by reorienting attention from the virtual world to which it allows access to the means of access; thus, Hegedüs concludes:

[T]he “endoscopic eye” or virtual camera is inducted symbolically into the mind itself, not in order to reveal some objective reality, but to display parts of a symbolic system laden with historical and personal resonance. Once entered, this virtual space becomes larger than its apparent container, seemingly monumental, offering a subjective point-of-view onto precipitous declines and vertiginous shifts of position governed by the visitor’s own hand. (cited in Duguet)

What can this virtual space be, if not the capacity of embodied human life to exteriorize its interiority, and thus, equally, an expression of the latter’s essential and originary technicity?

8. WORLDSKIN

The transductive correlation of vision and touch that emerges in Merleau-Ponty’s final lectures on nature entails a fundamental transformation of the closely intertwined conceptions of the body schema and of intercorporeality. Putting into question the distinction between the body as a thing and as my point of view on things, Merleau-Ponty would now appear to be capable of moving beyond the impasse presented by the *écart* (the failure of reversibility). Eschewing the alternative that informs reversibility, he insists that the body is “both: thing-standard as flesh” (*Nature*, 224). This means that the body schema has now become something more than simply the agent of the body’s access to the world: if “to sense my body is also to have its posture in the world” (224), this is because the flesh of the world is only phenomenalized in the flesh of the body (or, as Merleau-Ponty puts it, because “the flesh of the body makes us understand the flesh of the world” [218]).

The corporeal schema has, accordingly, been transformed from an organization of the individual body into a form of generality or commonality that directly characterizes the flesh of the world, the world as flesh:

The relation with the world is included in the relation of the body with itself. The relation of my two hands = the exchange between them; the touched hand is given to the touching hand as touching; they are the mirror of each other—something analogous in the relation with the things: they “touch me” just as much as I touch them. Not surprising: They are that on which the synergy of my body opens; they are made of the same stuff as the corporal schema; I haunt them at a distance,

they haunt me at a distance. I am with them in a relation of *Einführung*: my within is an echo of their within.

What follows from this reinscription of the body schema in the flesh of the world is a conception of intercorporeity that eschews the mediation of the image of the other in favor of a generality of sensibility, a sensible commons that is not simply a common sense:

But as a result, the corporal schema is going to be not only a relation to the things and to an *Umwelt* of things, but also a relation to other corporal schema. Among the things, there are living “similar.” These are going to insert themselves in the circuit of my hand to my hand. The coupling of my two hands = recognition of a “behavior” in which appears a “thing”; the active hand lives at a distance from the other. Likewise, the coupling of my hand and the hand of another: my corporal schema as an animal of conducts lives at a distance in the living exterior. There are [sic] among them a carnal relation, an extension of the narcissism of the body. This narcissism is also an opening to generality: I live the offered behaviors as my own, and I see them animated by a corporal schema. The flesh also resolves the problem here: it is because I perceive that the other is possible for me as an other perceiving the same sensibles that I perceive. Massive flesh of esthesiology, flesh of co-perception made subtle, of identification between corporal schemas. My corporal schema is projected in the others and is also introjected, has relations of being with them, seeks identification, appears as undivided among them, desires them. Desire considered from the transcendental point of view = common framework of my world as carnal and of the world of the other. (224–225)

This sensory generality furnishes a deeper foundation for what had earlier been the basis for intercorporeity: namely, the image of the other. Just as the elucidation of primordial tactility as a protoreversibility deepens, rather than displaces, the role of vision and its complex articulation with technicity, the sharing of body schemata serves to ground the commonality of the visible. It thus explains why the visual experience of the other (of the other’s image) can yield intercorporeity. For this reason, Merleau-Ponty can invoke “an opening of my body to other bodies: just as I touch my hand touching, I perceive others as perceiving. The articulation of their body on the world is lived by me in the articulation of my body on the world where I see them.” What is more, this sharing of embodied schematism introduces a reversibility at the heart of intercorporeity: “my body is also made up of their corporeality. My corporal schema is a normal means

of knowing other bodies and these know my body. Universal-lateral of the co-perception of the world” (218).

Because this reciprocity between my body and the body of the other comprises an emanation from the protoreciprocility of primordial tactility, it operates an extension of the *écart* into the domain of collective experience. Just as the *écart* marks a failure of reversibility between the hand as touched and as toucher—a failure which expresses the originary form of the *écart* as transduction of embodiment and technics—it likewise opens an irreducible asymmetry in the reversibility between my body and the body of the other. And just as the duality of sensation (and of primordial tactility) brought with it a fundamental chance—the chance for a coupling with the flesh of the world and with things—the asymmetry that informs collective intercorporeity (the sensory common) opens the chance for an at once more concrete and more generalized coupling with technics.

Accordingly, the very means facilitating my body’s opening to the flesh of the world and to things give concrete expression to the transductive correlation of primary tactility, to the *écart* as condition of embodiment and source of technicity. Today’s digital technologies and the mixed reality aesthetic that they support thus function to actualize the potential of technicity to be a *medium* for being. Through them, the transduction constitutive of primary tactility—the transduction of embodiment and technics, of interiority and exteriorization—becomes actualized as a technically specific and technically facilitated intercorporeal commonality.

Now it should be clear that Merleau-Ponty’s theorization of technics—limited to the conception of discrete prosthesis—fails to grapple with the technical “essence” of the human that, as I have suggested, lies at the heart of his conception of primary tactility and the structural coupling of the flesh of my body and of the world. To grasp this dimension of technics, then, we must turn to Gilbert Simondon, the French “biotechno-phenomenologist” and student of Merleau-Ponty’s, whose work takes up the thread of the latter’s unfinished final project and discovers, as the necessary correlate of a complex theory of physico-bio-social individuation, a convergence of the biosocial with the technical.

On Simondon’s understanding, individuation is an ongoing and interminable process, ranging from the physical (the process of crystallization is his key example) to the social; in all cases, it crucially involves a relation to the “preindividual,” the domain of “metastable” potentiality.

With his specific distinction between the subject and the individual within the process of human individuation, Simondon develops an account of the human as a living being constitutively in excess of itself and necessarily endowed with a collective dimension. Schematically put, the subject is the individual viewed from the standpoint of its ongoing individuation (or genesis) and thus through its constitutive relation to the metastable domain of the “preindividual”; the individual, by contrast, is the subject frozen at a specific moment of this individuation and cut off from the source of its (hetero)genesis, from the domain of potentiality.

The subject and the individual are connected via a disjunction: The subject encompasses the individual which in turn forms an element in the subject’s individuation. This means that the individual and the subject exist at different levels of being and that, because they do, the subject can undergo a (relative) “disindividuation” which, far from marking its dissolution as a subject, comprises the condition of possibility for the discovery of its latent collective dimension. With this discovery, the subject is able to resolve the tension generated by its constitutive excess over itself (experienced as affectivity) and, by putting itself in question through a confrontation with the preindividual it carries within it, can undergo a new (collective) individuation. Indeed, on Simondon’s account, every psychosocial individuation requires a relative disindividuation of the already individuated beings that comprise its elements. This disindividuation is simply the condition of possibility for the non-individuated potential (the preindividual) they each contain to be freed for a subsequent, higher order individuation. Not only does the subject perdure through these stages of individuation, but also—as one of their constitutive elements—it evolves in and through them.

What renders Simondon’s conceptualization a crucial continuation of Merleau-Ponty’s excavation of the technicity of the living is his correlation of individuation with technics understood as a quasi-autonomous domain of being—what Bernard Stiegler has called “organized, inorganic matter”—between the organic and the inorganic.²⁵ On Simondon’s account, technical objects are like living beings in that they must be understood from the perspective of their genesis or progressive individuation; yet, they differ from living beings in that, far from being given initially as concrete individuals, they only tend toward the concrete.

Nonetheless, by establishing that technical objects are the ever changing bearers of a genesis, Simondon accords them a certain

autonomy from the human. Though never entirely separable from human evolution, their evolution occurs through relations internal to the domain of technicity and is only punctuated by human intervention. For this reason, technical objects are able to constitute a medium for the biologically and psychically individuated human being to interpenetrate nature, as Simondon claims:

[T]hrough technical activity, the human creates mediations, and these mediations are detachable from the individual who produces and thinks them. The individual expresses itself in them, but does not adhere to them. The machine possesses a sort of impersonality which allows it to become the instrument of another human. The human reality that it crystallizes in itself is alienable, precisely because it is detachable.... The technical object, conceived and constructed by the human, does not limit itself to creating a mediation between the human and nature.... It accords its human content a structure similar to that accorded natural objects and permits the insertion of the natural effects of this human reality into the world.... A convertibility of the human into the natural and of the natural into the human is instituted through the technical schematism.²⁶

Put in Merleau-Pontyian terminology, this mutual interpenetration of the human and the natural could be said to actualize the *écart* of primary tactility—the gap between embodiment and technicity—that yields the asymmetrical interpenetration of the flesh of my body and the flesh of the world.

In fact, this connection to the primordial *écart* is precisely why technics can facilitate the convertibility that allows biologically and psychically individuated human beings to participate in a *transindividual* collective individuation:

[T]he technical world offers an indefinite affordance [*disponibilité*] of groupings and connections: For it is the result of a liberation of human reality crystallized in the technical object. To construct a technical object is to prepare an affordance ... beyond the interindividual relation which is not maintained through an operational activity, a mental and practical universe of technicity is instituted, in which human beings communicate through what they invent. The technical object understood according to its essence—the technical object such that it has been invented, conceived and desired, and taken up by a human subject—becomes the support and the symbol of that relation we want to call *transindividual*.... By the intermediary of the technical object, an interhuman relation is thus created that forms the very model of *transindividuality*. What is meant by this is a relation that does not

place individuals into relation by means of their already constituted individuality, ... nor by means of what is identical in every human subject, ... but by means of the charge of preindividual reality, of this charge of nature that is conserved with the individual being and that contains potentials and virtuality. (246–248)

By correlating *transindividual* individuation with technics, Simondon crucially expands Merleau-Ponty's conception of intercorporeity as a “commonality” of the body schema, as a “common framework of my world as carnal and of the world of the other” (*Nature*, 217/225). Indeed, the connection between the body schema and technics—the “technical schematism” as a medium for the mutual convertibility of human and nature—is precisely what conditions Merleau-Ponty's extension of the body schema to the point of its dissolution, to the point where it no longer serves to specify the boundaries of the body's interiority but rather to mark its ontological interpenetration with the flesh of the world.

Fittingly, this extension comes at the end of the final course on *Nature*, at the moment when the human relation to technics would (perhaps) “naturally” arise:

The corporal schema as incorporation. The corporal schema is that. Finally thus (above all by the vision of the self) a relation of being between:

- My body and the world
- The different aspects of my body; a relation of ejection
- Introjection, a relation of incorporation

It can be extended to the things (clothing and the corporal schema). It can expel a part of the body. It is thus not made of determined parts, but it is a lacunary being (the corporal schema is the hollow on the inside)—includes accentuated, precise regions, and other vague regions. (The hollow and the vague regions are the point of insertion of imaginary bodies.) Sensoriality (above all by vision) intentionally implies incorporation, that is, a functioning of the body as a passage to an outside, by its “orifices.” Other consequence: As my image captures my touching, the visual image of the others captures it also: they are also the outside of me. And I am their inside. They alienate me and I incorporate them. I see by the eyes of the other → the world. (278–279)

In this culminating recapitulation of the various elements of our previous excavation of primary tactility (note especially the complex imbrication of vision and touch as the foundation of intercorporeity), Merleau-Ponty

affirms the essential technicity of the bodily schema. By doing so, he furnishes a conception of the commonality of being that can embrace what Simondon has shown to be its necessary technical expression.

It should come as no surprise, given our focus here, that an elective affinity exists between this dissolution of the schema—together with the ensuing concept of “indivision” (279)—and the virtual. What remains to be shown is how Merleau-Ponty’s excavation of the transductive *écart* of primordial tactility serves to expose embodiment at the heart of virtual reality (and thus to confer on the latter its unavoidable status as mixed reality). That I shall do this through examination of a digital artwork should also come as little surprise. Indeed, like many other artworks discussed here, Maurice Benayoun’s *Worldskin* (1997, in collaboration with musician Jean-Baptiste Barrière) offers a performative allegory of the passage from the domain of the image—here in the form of the virtual as the exemplary instance of the technical mediation of specularity in our world today—to the domain that informs it and (on account of our originary technicity) depends on it: namely, the domain of tactility, motility, and embodiment.

Commissioned by Ars Electronica for the CAVE environment (a three-dimensional projection space encompassing three adjacent walls, floor, and ceiling), *Worldskin* foregrounds the crucial previously discussed distinction between operability and observation, participation and documentation (see Figure 1.8).^{xxxvii} The environment consists of imagery of recent war zones divided into two modes of interface: a three-dimensional world comprising sky and ground planes and a series of two-dimensional digital “cut and pastes” of mass media images of tanks, aircraft, buildings, and innumerable soldiers and war victims. Participants wear wireless LCD glasses which allow them to perceive and navigate seamlessly in the (passively) immersive projection space.

To interact with the environment, however, participants must make use of three still cameras hanging from the ceiling. When a participant points and shoots one of these cameras, the entire field captured by the pyramid-shaped aperture is transformed into a blank space. This destruction of the image is in turn doubled and reinforced by Barrière’s audio: at the moment at which the camera is snapped, the background noises of war give way to a sonic transform in which the sound of the camera clicking is abruptly replaced by sounds of guns being fired. Each exposure is subsequently printed to paper in the form of a blank



FIGURE 1.8 Maurice Benayoun, *Worldskin* (1997), interactive CAVE environment deploying photographic interface. (Courtesy of the artist.)

silhouette, providing the viewer with a material trace of his or her unique intervention into this archive environment.

In *Worldskin*, two divergent contemporary image technologies instantiating two longstanding aesthetic traditions—photography and virtual reality—are pitted against one another. The express intention is to catalyze a jump from the superficial level of the image as a neutralizing “capture” of the world to a deeper level where it forms a trigger for the viewer’s active engagement with his or her agency in the world. In this way, as I propose to demonstrate here, *Worldskin* advances a plea of sorts for a model of technics that would affirm, express, and indeed condition the dissolution of the body-world separation in our world today.

That this model crucially involves a critique of the ontology of observation as it is technically instantiated in photography—and that such a critique is undeniably a political project—becomes clear when we read Benayoun’s description of the work:

Armed with cameras, we make our way through a ... landscape ... scarred by war-demolished buildings, armed men, tanks and artillery, piles of rubble, the wounded and the maimed... Like so many tourists, we [visit the land of war] with camera in hand. Each of us can take pictures, capture a moment of this world that is wrestling with death. The image thus recorded exists no longer.... We take pictures. First by our aggression, then feeling the pleasure of sharing, we rip the skin off the body of the world. The skin becomes a trophy, and our fame grows with the disappearance of the world.... Taking pictures expropriates the intimacy of ... pain while, at the same time, bearing witness to it. This has to do with the status of the image in our process of getting a grasp on this world. The rawest and most brutal realities are reduced to an emotional superficiality in our perception. Acquisition, evaluation and understanding of the world constitute a process of capturing it. Capturing means making something one’s own; and once it is in one’s possession, that thing can no longer be taken by another.... The picture neutralizes the content. Media bring everything onto one and the same level. Physical memory-paper, for example, is the door that remains open to a certain kind of forgetting. We interpose the lens (“objectif” in French) between ourselves and the world. We protect ourselves from the responsibility of acting. One “takes” the picture, and the world “proffers” itself as a theatrical event.... The world falls victim to the viewer’s glance, and everyone is involved in its disappearance. The collective unveiling becomes a personal pleasure, the object of fetishistic satisfaction. We keep to ourselves what we have seen (or rather, the traces of what we have seen). To possess a printed vestige, to

possess the image inherent in this is the paradox of the virtual, which is better suited to the glorification of the ephemeral.²⁷

This agonistic face-off with photography yields a fundamental reorientation of virtual reality technology that exposes virtual reality—at least as it exists in the world today—as mixed reality, as a dimension or property of the “real” world. Normally understood to be a form of passive immersion, a distancing fascination that insulates “first world” spectator-citizens from the real, as Žižek famously contended in his denunciation of Western reactions to 9/11,²⁸ virtual reality here becomes a technical interface to the world that succeeds because it taps into the transductive coupling of embodiment and technicity constitutive of the human.

The viewer’s presence in this environment—her capacity to act within it—accordingly becomes a function of the technical distribution of her embodiment, of her exteriorization into the various effects of his or her intervention within the environment. To the extent that this distribution coincides with the transformation of the image from the superficial representation of the visible (the image of the body of the other) to the material traces or indices of the viewer’s kinesthetic movement (the blank spaces and the paper print-outs which uniquely inscribe the viewer’s position and orientation toward the images), it constitutes a paradoxical form of “embodied disembodiment.” I would suggest that this disembodiment perfectly expresses the contemporary (technically specified) form of the “indivision” invoked by Merleau-Ponty at the end of his exploration of the human body in *Nature*.

That such embodied disembodiment (or disembodied embodiment) instances the process of informational framing explored at length in *New Philosophy for New Media* fully attests to its role as an actualization, in and for the technical epoch of digital immateriality, of the originary indivision of the flesh (primary tactility). *Worldskin* calls on the viewer to coproduce images from information in conjunction with a digital environment, and its CAVE infrastructure inverts the relation of vision and touch so that, as Anne-Marie Duguet puts it, “the look does not ‘touch’ the image so much as the image touches the entire body” (210). However, precisely because it deploys this inversion *as the vehicle for the viewer’s disembodiment*, *Worldskin* perfectly expresses (in the act of performatively exposing) the contemporary (technical) dissolution of the divide between interiority and exteriorization, the flesh of my body and the flesh of the world.

Through its particular specification of the process of informational framing, the work thus *produces* the experience of embodied disembodiment, meaning that it actively dissolves (in order to reconstitute anew) the differentiation according to which embodiment and disembodiment have been set into opposition in our culture and in Western thinking more generally. To be yet more precise, *Worldskin* catalyzes a double transformation in the economy linking embodiment and disembodiment. On the one hand, the technical extension of vision (and of memory) carried out by photography is repurposed as a functional element of the viewer's embodied agency within the digital environment: the viewer literally acts through the camera, which is equally to say that the camera alone allows his or her embodiment to matter here. On the other hand, the viewer's embodied movement within the environment—the actual kinesthetic activity—is exteriorized (or distributed) in the technical traces created by his or her intervention into the image space. To the extent that these traces (the modifications of the images as well as the paper print-outs) inscribe the singular movement of the viewer, they literally comprise "embodied disembedments," material extensions of the viewer's embodied agency that, while remaining correlated with the latter, nonetheless function autonomously from it.

The aesthetic impact of this double transformation is perfectly emblematised by the work's redeployment of photography as a vehicle for the viewer's direct engagement in the (present) moment of interaction (or intervention) with the environment. As Anne-Marie Duguet has astutely pointed out, *Worldskin* playfully—though altogether seriously—asks its viewers to "photograph the virtual" (211). Because photography—the indexical medium par excellence—simply has no purchase in the domain of the virtual, what hangs in the balance is the status of what Roland Barthes long ago called the "photographic referent," the photograph's material inscription of the "that has been" [*ça a été*], the unique convergence of the real and the past. *Worldskin* in effect stages a dissolution of this function and, with it, a critique of photography's role as storage medium, as the exemplary form of what Bernard Stiegler has called "tertiary memory" (the memory of that which has not been lived by present consciousness but yet conditions its temporalization). More specifically, *Worldskin* aligns the storage function of photography (and of tertiary memory more generally) with the insulated, distanced stance of the first-world image consumer. When it compels viewers to destroy the tertiary image—here invested specifically as the material

support for this self-protective stance—*Worldskin* accordingly suspends photography's storage function. In the process, it redirects attention from the content of the image to its capacity to trigger embodied activity that paradoxically yields disembodiment as its material trace.

If photography provides a source of the preindividual and of the generic commons, as Stiegler has suggested,²⁹ it is not because it forms an archive of discrete memories whose adoption by individual consciousness necessarily informs the latter's temporalization (and the possibility for collective temporalization). On the contrary, the deployment of photography in *Worldskin* makes clear that it is the process of exteriorization which forms the source of the preindividual. That is why, again, the ensuing disembodiment is not so much opposed to embodiment as it is to its strict complement; bluntly put, disembodiment is the condition of possibility for embodied human life to sustain its (life-sustaining) contact with the preindividual.

Rather than offering an opportunity for the adoption of archived tertiary memories, *Worldskin* thus facilitates a self-reflexive *experience* of one's embodied agency in the world. To the extent that it exteriorizes embodied agency (thereby disembedding it), the work manages to separate it from the viewer's ongoing, constitutive, autopoietic embodiment and thus allows it to be fed back into the latter via a recursive coupling that comprises the contemporary correlation—the new economy as it were—between embodiment and disembodiment.

To the extent that we increasingly act in informational environments and in conjunction with informational agents, *Worldskin* thereby exposes nothing less than the general condition for embodied agency in our world today. With the ubiquitous infiltration of digital technologies into daily life, embodied agency becomes conditioned (necessarily so) by a certain (technical) disembodiment. Embodied disembodiment (or disembodied embodiment) accordingly forms a strict complement to the ontology of mixed reality conditioning all real experience. Just as all virtual reality is mixed reality, so too is all embodied life constitutively disembodied. Understood in this context, virtuality thus forms the basis for the convergence of the living and information underway everywhere today.

Such an understanding lies at the heart of Benayoun's endeavor in *Worldskin*, as can be discerned from his extended discussion of the constitutive impurity of virtuality:

When we come to understand that virtuality is, at the origins, a property of the "real" world, we should admit that the exchange

between fiction and reality would be balanced only if the dynamic and symbolic properties of the virtual representation become part of the physical world. This explained that, having been a matter of experiment, in search of specific properties that would only belong to the medium, VR and VE are becoming, like the art of using them, more and more impure. This impurity might characterize the mature stage of the medium, and the merging of the virtual and the physical world is probably the extension of the human trend of converting the objective environment into an informational system.³⁰

That this conversion informs *both* the integration of virtuality into the “real” world *and* the disembodying exteriorization of human embodiment only confirms the urgency of rethinking embodied agency in the age of digital immateriality. Because contemporary technics facilitate a dissolution of the body-world distinction (an “indivision”) that is fundamentally informational in its (im)materiarity and because human embodied activity is, in some way, the agent of this dissolution, we can no longer constrain embodiment to the body, can no longer contain it within the (organic) skin. We must—as Benayoun’s title suggests—extend it into a “worldskin.” As a concept for the contemporary technically facilitated indivision of the flesh, *worldskin* perfectly captures the complementarity between informational environment and disembodied embodiment that—as a technically specific actualization of the transduction of primordial tactility—ensures the “essential” embodiment of the former no less than the “essential” technicity of the latter.

9. THE TELE-ABSENT BODY

No contemporary media artist has been more directly concerned with this complementarity between informational environment and disembodied embodiment than Mexican-Canadian artist Rafael Lozano-Hemmer. In a series of performance installations collectively titled “relational architecture,” Lozano-Hemmer has variously deployed information technology to energize urban space. Defined as “the technological actualization of buildings and public spaces with alien memory,” relational architecture aims to transform “the master narratives of a specific building by adding and subtracting audiovisual elements to affect it, effect it and re-contextualize it.”³¹

Accordingly, Lozano-Hemmer’s relational architecture installations deploy media interventions into existing architectural space precisely

as a means of triggering embodied reactions (reactions which, as we shall see, tap into the disembodiment constitutive of embodiment). When these reactions subsequently enter into resonance with the media transformations triggering them, they establish feedback loops in which embodiment and information mutually catalyze one another’s ongoing evolution, rendering it a coevolution that perfectly expresses the contemporary stage of the technogenesis of the human.

Explaining that the “real motivation behind relational architecture is the modification of existing behavior,” Lozano-Hemmer stresses the creativity of this recursivity: Relational artworks, he maintains, “create a situation where the building, the urban context and the participants relate in new, ‘alien’ ways.” A relational work can be considered successful, he explains, if its intervention “actively modifies the point of dynamic equilibrium between the public’s actions and the building’s reactions, and vice versa,” thereby generating “chaotic … or emergent behaviors.”³²

Functioning together in this way, embodiment and information generate temporary transformations of built urban space that are simultaneously collective individuations of embodied human actors. By taking “indivision” to its ultimate point—the point where embodiment and information, functioning transductively, operate to “dematerialize” the environment—Lozano-Hemmer’s project forcefully demonstrates that embodiment today can only be conceived as *collective individuation*, as an individuation that requires a certain disembodiment of embodied individuals. The reason for this is simple: Because human embodiment no longer coincides with the boundaries of the human body, a disembodiment of the body forms the condition of possibility for a collective (re)embodiment through technics. The human today is embodied in and through technics.

Just such a realignment of the basis of embodiment is at issue—in a fully performative manner—in Lozano-Hemmer’s *Re:Positioning Fear—Relational Architecture 3* (1997; see Figure 1.9). Designed as an intervention into one of Europe’s largest military arsenals, the Landeszeughaus in Graz, Austria, the work consists of two components: an archive of “Internet relay chat” (IRC) sessions devoted to the discussion of contemporary fears and a “tele-absence” installation involving projection of shadows and text on the facade of the Landeszeughaus’ inner courtyard.

By linking the legibility of the text (the projection of the IRC sessions) with the projection of amplified shadows of participants’



FIGURE 1.9 Rafael Lozano-Hemmer, *Re:Positioning Fear* (1997), “tele-absence” installation. (Courtesy of the artist.)

bodies, Lozano-Hemmer directly correlates disembodiment with the informational transformation of the spatial environment. In this respect, he literally creates a “body-in-code,” as I have been developing the concept here, and in the process correlates the concept with a certain margin of disembodiment. Because the text only becomes legible against the background of an amplified shadow, the embodied participant’s transformation into shadow forms the enabling condition for the transformation of the physical façade into informational space. This latter in turn becomes the stimulus for continued participant interaction via the shadow interface, and an evolving feedback loop is established.

By calling this a “tele-absence” interface, Lozano-Hemmer foregrounds the complex imbrication of disembodiment and information

that will ultimately yield a higher order (collective) form of (technically supported) embodiment:

Even though the IRC sessions could have been projected on the arsenal by covering most of the façade, an interface was designed to prevent all of the text from being visible at one time. The interface is called “tele-absence” and it consists of an “active” shadow that reveals the text on the building. To read the building, a participant standing in front of it must wear a small wireless sensor and walk around the courtyard. As he or she walks, two pigi 7kW Xenon light sources track his or her position and project his or her shadow onto the façade of the Zeughaus. By using robotic lighting control, the shadows were focused dynamically so that regardless of the participant’s proximity to the lamps the shadows were always crisp and well defined. The final effect was a “dynamic stencil” whereby the shadow of the participant was an active architectural element which “revealed” the IRC texts that appeared to be within the building, as though the shadow was a cutout or an x-ray of the building. (“Re: Positioning Fear”)

Defined as “the technological acknowledgement of the impossibility of self transmission ... the celebration of where and when the body is not” (“Re:Positioning Fear”), tele-absence is less a simple disembodiment of the self-present human body than it is its re-embodiment in different, expanded form—namely, as an amplified shadow that is simultaneously the trigger for the dynamic informatization of a static physical building. In his commentary on the work, Brian Massumi astutely discerns the complexity of Lozano-Hemmer’s dance with (dis)embodiment:

If you think of the shadow ... as casting “absence” as a potential next action, ... the “where and when the body is not” becomes “where the body may relay,” and “the impossibility of self transmission” becomes a reminder that every stretch of the body is not just a displacement of it but a becoming. A body cannot transmit itself. But it can project its vitality. Its activity may take on a new dimension.

Massumi’s perspective here perfectly captures the indifferentiation of absence and presence, of embodiment and disembodiment, that characterizes human life in the informational age: “Seen in this way,” he continues, “‘tele-absence’ is perhaps not so different from ‘teleembodiment,’ the term relayed into in later work.”³³

Given my aim of introducing technics into Merleau-Ponty’s final phenomenology, it is hardly incidental that Lozano-Hemmer’s tele-absent extension of embodiment (and its qualified embrace of

disembodiment) breaks with the model of prosthetics which, as we have seen, informs (and compromises) Merleau-Ponty's explicit thinking of technics. Lozano-Hemmer's work makes clear that such a model simply cannot forego privileging the individual body and thus cannot tap the potential of technics to support "alien" forms of embodiment that do not coincide with the body and its potential prosthetic extensions.

As a contribution to Lozano-Hemmer's larger project of producing a new collective individuation of embodiment, *Re:Positioning Fear* takes the first step of disembodying the individual body, thus opening the possibility for a break from the prosthetic model of technics. This is precisely why Lozano-Hemmer insists that "the shadow is not an avatar, an agent, nor an alias of the participant's body" but rather "projected darkness, a play of geometries, a disembodied bodypart." As a negation of the body's static positivity, the shadow does not so much act in its stead as open its potential to be otherwise, thereby transforming it into "a site of telematic activity."

This material transformation of the body is what, for Lozano-Hemmer, serves to differentiate relational architecture in general from its virtual counterpart:

Virtual buildings are data constructs that strive for realism, asking the participant to "suspend disbelief" and "play along" with the environment; relational buildings, on the other hand, are real buildings pretending to be something other than themselves, masquerading as that which they might become, asking participants to "suspend faith" and probe, interact and experiment with the false construct. Virtual architecture tends to miniaturize buildings to the participant's scale, for example through VR peripherals such as HMDs or CAVEs, while relational architecture amplifies the participant to the building's scale, or emphasizes the relationship between urban and personal scale. In this sense, virtual architecture dematerializes the *body*, while relational architecture dematerializes the *environment*. ("Relational Architecture")

On this understanding, virtual architecture makes common cause with the model of technics as prosthetics: because it retains the scale of the individual body, it simply cannot overcome the division between body and world except through the illusion of simulation; in Lozano-Hemmer's vision, this illusion serves to dematerialize the body. By contrast, relational architecture undoes this division and promotes "indivision" precisely by dematerializing the environment, by transforming it into a cocreation of embodiment and information, of bodily performance extended through

information and of information embodied in such extension. What is thereby promoted is a model of technics as medium-for-individuation.

This model of technics foregrounds the complementarity of the two forms of individuation at issue in Simondon's conceptualization and in Lozano-Hemmer's relational works: the individuation of the (human) individual and collective individuation. The latter—specifically, the form that Simondon calls "transindividuation"—allows us to grasp how a certain disembodiment (understood as the individual's constitutive coupling to the preindividual) is a dimension of embodiment, as we have been maintaining for some time now. (In Simondon's parlance, transindividuation would be said to *resolve* the paradox of the human individual as a form of embodiment that is constitutively disembodied.) It is from the standpoint of transindividuation—an embodiment that is *super-individual* and also necessarily technical—that the excess of the individual over itself, the excess of its (preindividual) potentiality over its (individual) actuality, can be seen to be a constitutive dimension of its embodiment as an individual. In this respect, transindividuation can be said to be the ultimate expression of the primordial *écart*. In transindividuation, the originary transduction of embodiment and technicity constitutive of the human comes to yield nothing less than a technical embodiment of the indivision of the flesh, a technically embodied commons in which my body acquires its autonomy only through its participation in a larger process of embodiment.

The model of technics as medium-for-individuation thus forms the strict correlate of a view of the human that refuses to divorce technicity from embodiment and that therefore embraces disembodiment as a dimension of embodiment and as a potential for its extension beyond the body. If this model invests the *écart* constitutive of the human as the operator of human-machine interchange, it thereby gains a vastly expanded space of embodiment capable of encompassing technical extensions of the (human) body no less than concrete materializations of informational potentiality.

In this respect, my effort to introduce technics into (indeed, at the very core of) Merleau-Ponty's ontology of the flesh differs fundamentally from Gail Weiss' superficially similar attempt to position the *écart* as a "space of disincorporation that makes incorporation possible" (120). Insofar as it retains the separability of the body as body, Weiss' conception of technics is fundamentally a prosthetic one, on which technics befall the human from the outside and function merely to extend the

scope of its proper embodiment. As what makes the disincorporation of this body possible, the *écart* opens a space of noncoincidence outside the body (between the body and its outside) rather than an originary noncoincidence (the transduction of embodiment and technicity) *within* the body. That is why, on her account, the *écart* is the condition that allows “for human beings to ‘interface’ with machines, ... to become one with our familiar, mass-produced or even ‘one-of-a-kind’ prostheses (e.g., glasses, clothes, artificial limbs, moussed-up hair, cars, watches, etc.)” (120). For Weiss, in sum, the *écart* names the condition for a prosthetic extension of the already individuated human being; from our Simondon-inspired perspective, by contrast, the *écart* expresses the originary technicity of the human, the condition that has now, with today’s digital technologies, made real the co-individuation of technics and embodiment in the form of technically facilitated transindividuation.

Taking up the accomplishment of *Re:Positioning Fear* (the disembodiment of the individual body), Lozano-Hemmer’s *Body Movies—Relational Architecture 6* (2001) constitutes the artist’s attempt to produce a transindividuation through technical disembodiment and subsequent reembodiment on a transformed scale and via an informational circuit (see Figure 1.10). Like the earlier work, *Body Movies* uses a tele-absence interface—namely, the projection of shadows cast by participants’ bodies—to which it adds some new elements. These include the capacity for simultaneous, collective, indeed collaborative, participation; a role for body images; and a more direct assault on the culture industry and its domination via the circulation of mass illusion.

The work, which played from August 31 to September 23, 2001, in the Schouwburgplein in Rotterdam, consisted of the projection of over one thousand prerecorded portraits (captured in Rotterdam, Madrid, Mexico, and Montréal) onto the façade of the Pathé Cinema building. Powerful xenon lights placed at floor level totally washed the images out except when they were blocked by passersby whose bodies cast shadows of variable size (from 2 to 22 m high, depending on how proximate they were to the light sources) onto the façade, thereby rendering visible the otherwise hidden images. The locations of the shadows were continuously monitored in real time by a camera-based tracking system and, each time the shadows matched all the portraits in a given scene, the computer automatically updated the scene with a new set of portraits.

In his description of the work, Lozano-Hemmer stresses the way in which *Body Movies* encourages participants to embody the massive



FIGURE 1.10 Rafael Lozano-Hemmer, *Body Movies* (2001), “tele-absence” installation. (Courtesy of the artist.)

portraits (by superposing their shadows on them) only to frustrate this attempt by immediately replacing the images once they are so embodied. Linking this paradoxical structure to his effort to “introduce ‘alien memory’ as an urban catalyst,” Lozano-Hemmer unequivocally characterizes the interactional space of the installation as a space in which the body “does not belong”—that is, as a space that cannot be inhabited by means of the body image, of the body as an image, and of the image as the medium of the commonality between bodies, intercorporeity.³⁴ More clearly than in *Re:Positioning Fear*, the disembodiment of the body is carried out via a performative critique of the superficiality of the body image. Still, as was the case in the earlier work, what remains instrumental in the interface is the role of the shadow as a negation of the body’s positivity, as a disembodied anti-image of the body, which can achieve agency within the informationally energized space of the installation solely because and insofar as it dismembers the individuated body.

In contrast to *Re:Positioning Fear*, however, this disembodiment is here deployed in the service of a broader aesthetic aim—that of creating the possibility for a form of communion rooted in a technically facilitated kinesthetic space, a technically generated space of intercorporeity that embodies the indivision ensuing from the dissolution of the

corporeal schema. To this end, *Body Movies* expressly solicits collective participation and, through it, the emergence of unpredictable behaviors. As Alex Adriaansens and Joke Brouwer describe it, *Body Movies* invited people on the square, up to 50 of them at a time, "to embody different representational narratives," thereby allowing them to create "a collective experience that nonetheless allowed discrete individual participation (Adriaansens and Brower)."

What this invitation facilitated can be gauged from the documentation video on Lozano-Hemmer's Website (<http://www.fundacion.telefonica.com/at/rh/video/bodymovies.html>), which features various games involving disparity of scale and, interestingly enough, wholly unrelated to the prepackaged images highlighted by the various shadows at play. This hints at the work's success at guiding participants away from simple mimetic identification with the body image and toward creative play with their disembodied shadows in this new space of *indivision*. An experience is thereby facilitated that is entirely unprecedented; in the words of one Dutch participant, there is a possibility for "a strange kind of communication with people you've never met," one where "you're all together but you're also separate" (interview from the video cited earlier).

Creating the possibility for such communion—for a truly impersonal communication or, better (following Walter Benjamin), for the "communicability" that underlies and facilitates communication—is the ultimate aim, and the ultimate accomplishment, of Lozano-Hemmer's relational aesthetic. What is truly inspiring about his work is the way that it facilitates communion: namely, through the use of the most advanced configuration of technics and embodiment imaginable, one in which technics is treated as an originary dimension of embodiment and embodiment is understood to be a creation of bodily performance of and through information.

"Computers can communicate very efficiently; but they can't engage in communion," notes Canadian theater director Robert Lepage. Explaining his own preference for catalyzing "collective experiences rather than using individual interfaces for solitary participation," Lozano-Hemmer reaffirms Lepage's affirmation of communion. For Lozano-Hemmer, what is crucial "is people meeting and sharing an experience," people "coming together," and indeed, "coming together in the flesh." If the contemporary phase of our (human) technogenesis makes such *physical* communion increasingly difficult, it simultaneously opens more radical possibilities for communion. As Lozano-Hemmer's work perfectly

illustrates, such possibilities stem from our investment in technics as means for overcoming the atomic isolation of the body. They give us chance to live the "indivision" of body, its immanence to the flesh of the world.

In sum: By glimpsing and helping us to glimpse what such living might be, Lozano-Hemmer's relational works make good the promise, "contained" in the primordial *écart*, for a form of life—transindividual—that exploits the originary indifferentiation of embodiment and technicity to the point at which human technogenesis parts company with the organic (human) body. It does so, however, without losing its constitutive concern for the human as a form of the living.