8 Refrain

Sometimes, more often in recent years, I've taken to asking students and colleagues, "Why do you do what you do?" Although that question is not the same as "Why do we live?," it is not unrelated, because I think *how* we live would be part of my own response to the question of why we live. The quality of life is perhaps a more fruitful question than the meaning of life, so popular in an earlier era, more enamored of epistemology. It could be a phenomenological question about the experience of life, but I would like to answer it in a poetic way in the context of contemporary and emerging technologies of performance, where performance is construed generously beyond the domains of performing and performance arts.

One may aspire to do philosophy in the mode of poetry again, a Laozi multiply transposed. But didn't Plato throw out the poets from the Republic because they operated in the realm of the fictive imitative, thrice removed from the truth, and therefore were not to be trusted with the proper affairs of the *polis*? I wrote this book as an exercise in philosophy in the mode of art, trusting that it can be done, that it matters not only what we say or do, but *how* we say or do it. I've wagered that both truth effects and ethico-aesthetic passions can be accommodated in the same breath, the way mathematicians construct truths. Mathematicians are not scientists, because their theorems do not claim anything about the "real" world. Therefore they do not write under the sign of empirical truth. Mathematicians prove theorems true or false within propositional systems that they themselves construct. Therefore their constructions are works of imagination. Writing neither under the sign of truth nor of fiction, mathematicians create truths via imaginative processes that can be regarded as poetic processes.

It is in this spirit that I propose exploring some questions refined from crude, concrete, and technical craft, refined over the years into what would typically be considered philosophical questions. But, together with a set of fellow artists, engineers, and scholars, I have explored those questions via a hybrid of material and phenomenological experiments that have been built in the Topological Media Lab and by affiliate art groups, notably Sponge and FoAM.

Questions of craft can become refined into questions of philosophy, and questions how become questions why as well. Questions of philosophy in turn can provide heuristics, though never blueprints or methodologies, for craft. The most compelling reason for refining technical challenges into philosophical questions is to accommodate value. Given that we can engineer A, B, or C, the question we ought to answer first is *why* A, B, or C? Such an ambition places this project in the area of the critical studies of media arts and technology. However, the project of constructing a genealogy of topological media embodies a more radical ambition, which is to produce matters of value as well as matters of fact. To make sense of how we may approach the production of matters of value occupied the central chapters of this book.

Recall that the topological is about the continuous, about proximity and connectedness without metric quantity. The topological is the second most primordial mode of articulating the multitude of which Michel Serres writes in *Genèse*. (Set theory is more primordial, but too bare to be adequated to life, witness Badiou's herculean efforts.) Topology is, in a strict sense, immeasurably richer than the graphs and networks favored by engineers and their social scientists! Topological media for me is a set of working concepts, the simplest set of material and embodied articulations or expressions that allows us to engage in speculative engineering, or philosophy as art, and to slip the leg irons and manacles of grammar, syntax, finite symbol systems, information and informatics, database schemas, rules and procedures. I claim that topological media as an articulation of continuous matter permits us to relinquish a priori objects, subjects, and egos and yet constitute value and novelty.

In this sense, I think of the material, corporeal, technical, experimental work with the Topological Media Lab as an art practice, deeply informed by practices of engineering, mathematics, and philosophy and some lives of activism.

In 1995, I formed a faculty seminar called the Interaction and Media Group at Stanford's Humanities Center, with professionals and colleagues from the humanities and a few sciences. One key aspect of some members' works since then has been to construct conjectures as environmental installation-events so that participants in our conversation could encounter them palpably and speculatively in events that suspend certain assumptions (a scientific attitude), yet retain all the affective density of lived experience (an artistic attitude).

From "What Is the Human?" to "How to Human?"

In order to *experimentally* investigate and refashion the fold between nature and artifice, signs and matter, ego and other, twelve years ago I wagered that we must create a responsive medium as a continuous amalgam of computational and physical matter that is accessible to our craft: projected light, organized sound and video, fabric, choreographed bodies, speech, software. It was in order to build the apparatus and the
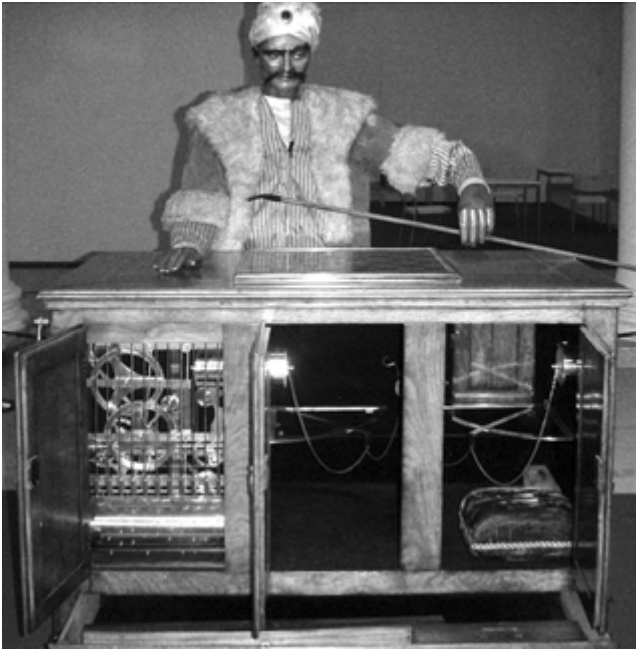
Figure 8.1
Sentient ocean matter. Still from film *Solaris*, by Steven Soderbergh, 2002.

techniques but most importantly to mentor and host a new sort of experimentalist that I formed the Topological Media Lab in 2001.

What we have put in question are certain categories such as *technology*—synonymous with digital or computer technology—the *cogito*, as well as the *body*. In order to understand such ontological or phenomenological categories, our strategy has been to experimentally transgress those categories' boundaries rather than assume them a priori.

It may help to compare this with the modern investigation of intelligence. The Enlightenment's formation coincided with a fascination with the boundaries of the human, indexed by such quasi-objects as Wolfgang von Kempelen's chess-playing automaton of 1770, the Mechanical Turk.[1] In the first age of the electronic computer, one of the grand challenges computer scientists set for themselves was to build a computer that could play chess better than any human. Such a specialized quest was justified on the grounds that exceeding the cognitive limit of the human in this dimension could yield insight into the extent and even the structure of human cognition engaged with this sort of puzzle solving. It is characteristic of contemporary science to be singularly obsessed with cognition. And it seems that even in the less explicitly anthropocentric work of software engineering, we tend to enshrine ourselves in what we create. My alternative concern lies with the conditions of possibility for ethico-aesthetic play: *poiesis*, to use an ancient word in sympathy with Félix Guattari's *chaosmosis* and Isabelle Stenger's *cosmopolitiques*.

In a parallel but more substrate and materialist mode, I propose to bracket the human in order to understand not so much the "what" but the "how" of human experience: I would not ask "What is a human?" but, to borrow Ann Weinstone's

Figure 8.2
The Mechanical Turk, 1770.

phrase, instead "*How* to human?" Sidestepping this "self"-absorption permits us to address the question without tautology. How? My strategy has been to bracket, to put in play, beliefs and disbeliefs about the body, synchronic structure, and objects.

Bracketing Body, Grammar, Cognition

One conventional limit of the human is the fleshy body, so let us put that in play. But how could we bracket the body phenomenologically, and what are the consequences of such a bracketing? To put the concept of the body in play is not to deny or to hide the body[2] but in fact to pay attention to its framing condition. The concept "body," of course, is motivated by my and your fleshy bodies. However, I do not restrict it to humans and animals, but use it mindful of Whitehead's entities and actual occasions.

In general I find it helpful to imagine the world, as I said earlier, not as a vacuum raisined with corpuscles but as a plenum of varying density. With such a field-based approach, the body becomes a local density whose boundary is implicitly and provi-

sionally defined by contingent anticipation or imagination and by the expectations formed in the course of contingent performance.[3] Of course it follows that these densities and boundaries vary over time, from moment to moment, and from disposition to disposition.

A set of pedestrians' or dancers' limbs moving in tandem could form a body, as could a group of voices momentarily syncopated. What we ought not assume, however, is an invariant deterministic mapping from physiological data to metaphor. Although an invariant mapping may be a necessary working notion for neurologists and linguists and engineers, we need not and should not, as poets or as phenomenological experimentalists, assume a discernible deterministic relation between physiological data like heartbeat, galvanic skin response, or breathing rate and macroscopic aspects of a performative event, like emotion, mood, or narrative entity. Pragmatically, what we learn from neurophysiology and the principled scientific study of neural phenomena is that the data are simply too complex and polyvalent to plausibly map to any simple linguistic token of an emotion or some human behavioral state. A smile could correlate with amusement, embarrassment, confusion, or the rictus of death. A spike in the nervous signal of a muscle could correlate with an equally great variety of putative "causes." But beyond such pragmatic concerns, there is a more fundamental conceptual issue. Such a mapping would be merely a trace of the physical other, which is not identical and may have only accidental relation to the embodied phenomenal experience.

As an aside: It is true that an artist may intentionally impose a mapping, but the art of a responsive environment such as what I have built with the Topological Media Lab lies in the fashioning of a substrate, not merely a particular object in a particular event. Turning from art to experimental research, in order to unmoor ourselves from preconceptions of body and embodiment and to free the actors' tissues from predesigned "mappings" of cause and effect, our responsive environments should provide extra modalities of media in addition to the ordinary tissue of the performer-player. Put more strongly, a responsive environment could put in play the Newtonian distinction between living tissue and inert matter. For the present, the modalities are primarily those of gesturally modulated light, sound, and sensor-augmented fabric. If you move, your skin shrugs over the bones of your hand not in a dialogic response to your action, but as the locus of intentional imagination fused with the physics of muscle and bone. In the same way, we create our calligraphic video, sound, and fabric not as precarved masks or prosthetic devices, but as expressive tissue that can be charged and recharged with latent, potential responsivities to gesture and movement. Continuity of media and body, whether effected by techniques of camouflage and projection or by haptics and sensors and active cloth, leaves open the boundary of the performing body in the way that helps us as experimentalists in performance research to explore just such a bracketing of the body.

Now, having suspended the body in this sense, what if we suspend the cogito, even the subject as well? How could we do this? Since 1997, my strategy has been to suspend a technical reliance on representations that are built from linguistic structure (canonically rule-bound systems of lexicon, grammar, syntax). This eliminates the majority of games and so-called interactive art as apt apparatuses for playful ethico-aesthetic research.

Deferring such representationalist presumptions and models allows us to see how subjectivities emerge under the dynamics of copresent play, and what becomes of agency. As composers of responsive environments, we can ask where we should locate the causal agency of a human-machine system.

Our typical model of interaction has been of humans and their proxies engaging in an action-reaction ping-pong. And interaction design, even in its most enlightened mood, has been centered on the human (viz. "human-centered design"), as if we knew what a human was, and where a human being ends and the rest of the world begins.

The chess-playing Mechanical Turk, in fact, turned out to be powered by a human hidden inside the box. Three hundred years later, I suggest, engineering and computer science operate largely on the same conceit of homunculi, of putting software proxies for *Homo sapiens* into our machines, from the ENIAC to the fictive Hal 9000 in *2001*, to the agents of Sim City and the customer call center's speech recognition program that can interpret telephoned speech as well as John Searle's Chinese Box. This anthropocentric conceit is not confined to engineering, of course. Look at Bill Viola's beautiful series of video works, *The Passions*. If we really take seriously the challenge to pursue art all the way down, and if we are willing to put in play, in suspension, all the putative atoms, objects, and subjects of the world, then I ask you this question: To whom do you owe allegiance: *Homo sapiens rex*, or the world? How one responds to that question has deep implications for how one works as an artist, a scholar, or a technical individual (to use Gilbert Simondon's term).

Apart from the totalizing and dematerializing power of the Judeo-Christian God and of informatic and logico-linguistic schemas, essentially the only ethico-aesthetic choice in the West has been to start with the self, with *Homo sapiens*. We witness the disastrous global ecological and economic consequences of this choice. However, given topology as a way, even a rigorous and precise way, to articulate living, nondenumerable, dense, nondimensional, open, infinite, and continuous matter, one has the option of choosing the world instead. I use these adjectives precisely for their intertwined technical and poetic values. But of course this is not a cure-all, a recipe for success, just as Deleuze and Guattari warned us at the end of their chapter on smooth and striated spaces: "Never believe that a smooth space will suffice to save us."[4] It's an approach to design, a way to imagine and think about living in the world, how to shape experience, a disposition with respect to the world, rather than a methodology or a technology.

Figure 8.3
Bill Viola, *The Passions*, video installation, 2003.

Political Economy, Institutions

Of course all this work does not take place in a vacuum. I accepted the Canada
Research Chair in New Media in 2005 in order to transplant the Topological Media
Lab from a technoscientifically respectable institutional setting to a political economy
that could support a much more sustained and experimental practice of media arts,
what is more and more explicitly not art or technology but experimental philosophy
and philosophical experiment cast as installation-events.

One of our mottoes for the TML is "Art all the way down"—meaning not taking
for granted any black box around technology, and reserving the right to critically and
materially investigate any border between concept and craft, between art and engi-
neering. This implies being able to open up technologies to artistic intervention. As
technologies I include the algorithms, the choice of programming method, the hard-
ware, in our case the computational technologies underlying contemporary media.
But thanks to the atelier's institutional embedding in Concordia University's Hexagram

research network in Quebec, we have been experimenting with the institutional and organizational structures as well.

Chapter 7 reprised some of the organizational and the external socioeconomic conditions under which we have been able to pursue this work. Any experimental work relying on technology, or any work that coarticulates emerging technologies, especially our pervasive computational technologies, necessarily contends with political economics of government funding agencies, corporations, and universities. That is part of the framework that the lab has leveraged in order to build the apparatuses that focus on how events may be charged by responsive media in contingent and composed situations.

Apparatus, Responsive Environments

Turning from the institutional context to the experimental apparatus, I have built a series of media choreography systems with the teaching/research atelier over the past decade. Currently named Ozone, the gesture-sensing and media resynthesis system produces responsive sound and video with behaviors that evolve in the course of play. It enables composers to distribute agency in a much more fine-grained way through the different components of the media architecture, but it evolves with the activity of the human participants as well. Indeed, this mode of conditioning an environment to coarticulate an event challenges media composers to relinquish fully a priori control, to accommodate contingent activity of the participants yet shape event potentials yielding experiences that feel more engaging than accident or pastiche.

In my view, one condition for an artistically compelling experience in a responsive environment is that it should not induce puzzle-solving behavior. The mechanism should be completely obvious, or completely transparent. I prefer to create installation-events in which participants may have compelling experiences without having to think about how everything works. This cognitive response has become almost inevitable among experienced consumers of interactive art, because that is how we have come to expect to play with a machine. But puzzle solving is a poor substitute for theater or any thick form of life. More fundamentally, puzzle solving ferociously reinscribes only cognitive acts, and a particularly reduced set of such acts at that. This eliminates most games and rule-based "interactions" from our set of techniques for building an experimental apparatus.

The TGarden is an example of a responsive environment in which people can playfully improvise gestures, and collectively or individually create affectively or symbolically charged patterns out of fields of varying light, sound, fabric, or bodies. The media synthesis processes develop continuously according to a field-theoretic, magical physics without propositional logic, schema, or symbolic computation. The textured

video and sound fluidly evolve according to autonomous processes as well as in response to the players' activities. The continuous shaping of the responsive media follows definite, composed metaphorically described tendencies that give a characteristic potential to the experience in a particular aesthetic, performative event. One might say that the potential dynamics created by the composers of such a responsive environment are a collective social gesture eliciting a collective response from the ambient social world, rather than a predetermined set of calls and responses à la Disney imagineering.

My point is that such a responsive environment can host more than an art installation-event; together with its makers and players it can serve as an apparatus for an experimental investigation of subjectivation, in Guattari's sense (see *Chaosmosis*). In order to conduct this exploration in the mode of experimental performance research, we focus our attention on the amplification of metaphorical gestures by copresent humans performing in a shared responsive medium imbued—by computational means—with alchemical, responsive properties.

Almost all the events for which we have been making our apparatus over the past decade and a half share the following common conditions: (1) the participants are copresent in the same physical space; in principle you can stop the action by touching a coparticipant; (2) inhabitants improvise collectively or individually significant gesture; (3) these gestures act continuously in a thick event that is richly augmented by media, evolving in concert with activity.

The question has been how events in everyday settings can assume symbolic charge of heightened theatrical events. But in shifting from the explicitly marked theater, we shift from explicit action sequences to conditions of possibility for topologies of potential action.

A Materials Science

Motivated by such situations, I ask "How to human?" but in what I term a more *substrate* material mode. In fact, what is suspended is not just bodies but subjects and objects generally, all part of a century-long resistance to an ever-present tendency to make the immanent and contingent appear fixed and transcendental, to make humans god. Put positively, my approach recognizes objects but focuses attention on the processes by which they come to be. But these processes are material, hence the attention to substrate.

Indeed, I sometimes characterize the empirical practice of the Topological Media Lab as a form of materials science, taking the term into much deeper waters. Adopting the more modest spirit of making a textile rather than a jacket, one can ask what would play the analogous role of X in the following relations:

JACKET : TEXTILE :: PERFORMANCE-EVENT: X

In the case of sound, what is the substrate, or stuff, X? What is the stuff of gesture? More radically, what is the stuff of event?

I claim that the stuff of event in our present state of technology would have to be material which for our working purposes I characterize as the amalgam of *matter + energy + affect*, the hybrid, dynamical, responsive fields out of which particular narrative objects and event sequences emerge. These fields constitute what I call the substrate. The TGarden technology constitutes not a particular sense making (gestures), nor an event action sequence like a stage play or a game, nor even a generalized language, but the substrate to a continuous range of performance.

I should emphasize that I do not wish to use "substrate" in its ordinary sense of being prior to or more foundational than its objects or events, but in the sense of the physics of fields. The substrate is constitutive of the objects and events that form in it; in other words, the substrate and its contingent objects occupy the same ontological stratum. So objects do not emerge out of the substrate, objects emerge in it. The substrate is immanent in its dynamically forming and dissolving objects.[5] What this offers performance is an alchemical technology for poetic matter. Such technologies of, for example, gesturally nuanced real-time video and sound synthesis, and of responsive, sensate and luminous electronic fabrics comprise contemporary amplifications of the technologies not of representation but of performance.[6]

What is the medium of gesture in this extended dynamical setting but continuous and open material, that is, a topological medium?[7] We use topological media not to represent some abstraction, but as the substrate of performance and physical action itself, an expressive tissue amalgamated from gesturing flesh and resynthesized video and sound. Where Grotowski challenged actors to use their own bodies as their expressive medium, in studio-laboratory work I take as my challenge creating computationally mediated matter for expressive presentation.[8] Analytic sciences and philosophy may be less attuned to this nonrepresentational use of matter because matter, whether ink and paper or fabric, has tended to be regarded as part of dumb nature, the object of mere craft (not art). Literary theory and until recently cultural studies might gain analytic purchase on matter only so far as it could be traced as linguistically signifying matter.[9]

Matter, topologically construed and topologically constituted, may serve as the substrate of poetic expression.

Material Practice

Can the material process of making things collectively be radically nondenumerable, countless, noncomputable, nondimensional, infinite, and yet remain also immanent,

embodied, and continuous? Can we make play spaces that evoke not puzzle-solving behavior but sustained ethico-aesthetic play, and marvel, vertigo, or elation? Yes, in fact, if we make structures and objects contingently out of the material substrate, activated by dynamics sensitive to fields of intensities and tensions such as what I suggested in chapter 4 or others yet to be discovered. The material fields I provide a way to shape are both continuous (topological) and dynamic, saturated with and constituting time.

To respect the open, unbounded lifeworld, such a space should not be useful or therapeutic. In fact, that was Guattari's point about psychoanalysis, too, that its purpose should not be to help the participant construct a narrative analogous to the hermeneutic objective of classical psychoanalysis—"This is what the patient's phobias / psychoses / dreams mean"—nor to effect a cure—the "therapist's" analytic stance with respect to his patient: "You are sick. We will fix you."

Why not just enclose a volume of ordinary space and repeat some experiments like the action art of forty years ago? Why not pursue an Artaudian project with Grotowski's via negativa of theater reduced to the fleshy but intensely disciplined body? With such techniques, a responsive environment could be charged with latent magic, a heightened potential for charging gestures with symbolic power. Such an environment could become a theater for the alchemical ontogenesis of hybrid matter, not a space for cognitive games, inducing puzzle-solving behavior, or simply a bath of raw qualia. An alchemical theater would avoid having "users" and "system" building models of each other. (In the human, such models would be cognitive models.)

As a personal practice, responding to a certain blend of American and Chinese pragmatism, I try to pair negative critiques with constructive alternatives. So let me offer a parable about topology in lieu of a full discussion which would be yet another seminar series. Allow me to suggest a reverse allegory and use a piece of the world to stand in for some concepts of the topological that I have introduced in this book.

Here is a patch of sod like the one that I cut out of the earth under a tree outside the RIXC building in Riga, Latvia. Representations, words, are like blades of grass, individually well formed, discrete. I can pull up this piece of sod and turn it over to reveal the root structure underneath. Yes, there is a network of roots as we can plainly feel running our fingers through the dirt. However, I draw attention past the blades of grass and their contingently formed roots to the dirt and the moisture in between the roots. It's the continuous, nourishing, dark, loamy stuff in between the discrete structures that materially constitutes the Earth. This moist earth is always and everywhere in continuous transformation. Our discrete structures, our words, syntax, grammars and schemas and methodologies are the blades and at best the roots. And yes, they are our best ways to grip the earth. But though they are a common supraindividual resource, they are not transcendental. They can only take form in and draw meaning from the earth, and become earth when their life cycle is finished.

Figure 8.4
Grass SOD ≠ RHIZOME. Photo by the author.

Archimedes said, "Give me a place to stand, and I shall move the world." However, what if there is no place to stand inside a bubbling chaosmotic soup of infinite inflation? To what extent can we alchemically open and critically transform all of modernity's black boxes—its conceptual fulcrums for good or ill—such as "market," "machine," or "human," if we do not have a place to stand in this age of globalized empire and permanent war? Is there any possibility of an immanent resistance for us not as nondocile bodies, but as resistive and desiring tissue? Yes, I believe, yes, if we take reality already as an amalgam of the potential and the actual, dematerializing, for example by becoming fictive, and rematerializing under the incessant quickening action of our imagination. This affords openings for life in the mud-filled interstices of our technology.

All the modes of articulation I have suggested in this book come with their technological complements, just as certain modes of languaging come with their complementary grammar. Working with substrate enables us to work with material = matter + energy + affect without a point locus.

If we use "implication" in the sense of enabling, this removes the necessity and the imperative, replacing those with the sense of permitting and sustaining as partial actions (analogous to partial object) to be defined only in the event. (It is exactly in this sense, for example, that we can modulate the experience of a potential state topology in the Ozone media choreography system. The potential topology conditions but does not determine actions or event sequences: there are no forced moves in the media or by the participant. And the space of possibilities is open and dense.)

This combination of material substrate with a nondeterministic logic permits us to work expressively in a textural, non-Archimedean way that can be "scale-independent." My mode of articulation for this is not the pattern of graphs, but the modes of continuity, proximity, density, and continuous transformation, in other words the primordial mode of (point set) topology.

Concerted Ontogenesis and Costructuration

Seeing in terms of substrate and dynamics recalls a motivation from a conference attended by Stengers, James Williams, and a younger generation of scholars interested in the relation between Deleuze and Whitehead: the possibility of theory *adequate* to life. Any theory must accommodate dynamical, material patterning, i.e., a material ontogenesis; in my processual interpretation of *ontogenesis*, the formation of objects in continuous material field.

Having developed this notion of the substrate, we can address three related questions about the phenomenology of performance. (To be very clear, my understanding of phenomenology is somewhat heretical because I relinquish the Cartesian project threading Husserl and Heidegger.)

(1) How can people coordinate transformative and compelling experiences without relying on conventional linguistic categories such as verbal narrative? The technical analog to this is: How can people create sense together in a responsive environment without appealing to grammatical structures?

(2) How could people improvise meaningful gestures collectively or singly in an environment that is as alive as they are, an environment that itself evolves over time as a function of its inhabitants' life?

(3) How could objects emerge continuously under the continuous action of inhabitants in a responsive space? Recall that this question itself arises from a critique of technology that we encountered earlier, a skepticism of psychologism, behavioralism, and representationalism, of which genetic determinism is a corollary.

As we saw in the TGarden's improvised nonverbal events, people can shape and create sense in their material, ambient substrate without recourse to any linguistic representation. But here is a problem. Suppose we have a more conventionally constructed computational media environment in which the software is coded with conventional procedural programming languages, implementing decision and Boolean logics. But suppose the intermediating layer of media is built with nongrammatical texture. Is the person improvising and operating with the patterns of procedural logic, or with the nongrammatical texture?

Moreover, this improvisatory signification can be responsive and collective. As for the second question, I argue that the continuity and density of the substrate, and costructuration that permits infinitesimal variations from a point, lend themselves to easy improvisation of significant gesture. People can improvise gestures as they already always have in continuous media like water or snow. And third, objects can be reinterpreted more contingently as variations in local densities, concentrations, or even as invariants under some thick set of continuous transformations.

Let me present some examples of call and response, and of concurrency. The typical sensor-based approach to interactive media models a processing chain passing from human movement through sensor hardware (modality), sensor data, denoising, feature extraction, mapping logics, synthesis, spatialization, and digital-to-analog sonification. The engineering approach is to design a sequence of hardware devices and accompanying software that process the chain of data from corporeal action to media.

Out of respect for the musicians' decades of experience performing in ensemble, initially the electroacoustic instrumentalists merely augmented the sound as conventional instrumentalists improvised material. But over three years, the conventional-instrument musicians learned to play through and with the processed and synthesized sound, and the electroacoustic instrumentalist-programmers learned not just to process what the microphones picked up, but to actively play in concert with the other instrumentalists. They progressed from electroacoustic programmers and sound designers

to performers with coequal responsibility in a joint performance. Specifically, sound artists and musicians such as Tim Sutton, Navid Navab, and Julian Stein fashioned instruments for live performance out of extensive real-time computational sound analysis, modeling, and resynthesis toolkits. What twenty years ago would have taken minutes to analyze "off-line" can now be done on the fly. For example, IRCAM's OMAX uses signal analysis methods to construct, on the fly, new voices out of "similar" segments from the given audio input. Most importantly, a host of similarity measures can be prepared by the programmer in advance and used to construct multiple voices that the performer can modulate in live performance together with the other musicians. These resynthesized voices can be quite distinct in timbre or other sonic features, yet have a discernible relation to the other musicians. In fact the electroacoustic instrumentalist plays in concert *concurrently* with the rest of the ensemble, and can even take action to musically tilt the performance together with his or her partners. From the perspective of the performer, concurrency is as familiar a mode of collective articulation as call and response.

The question of agency appears as an analytic distinction, but disappears under a more symmetrical, unbifurcated concept of costructuration. One of the most successful fusions of experiment and research creation that the TML has realized, in my opinion, is the Ouija movement experiments. Ouija was a set of phenomenological experiments legible to philosophers but simultaneously also structured improvisation exercises legible and familiar to trained dancers or actors. Some of the conceptual questions were: How can dancers make movements with sense sans grammar? How can a group of people in the same space cocreate an event in concert with a live, responsive environment? How does a movement-object emerge continuously out of a continuously distributed volitional or affective field?

Quickened Matter

So what are the implications of regarding experience as inhabiting the world as quickened matter? I suggest that materiality and lifelikeness of objects can be taken as *effects* of process, rather than predicates on objects. Nevertheless, objects are not epiphenomenal, because they and the processes under which they emerge as invariants are immanent in the magmatic substrate that constitutes the world.

Furthermore, inhabited in such a mode, this world is as rich as we can imagine it—rich, not complicated, in the same way that Simondon characterized the difference between machine memory and human. Richness entails value, and for me what's valuable is not denominated solely by use value or exchange value but is suffused with value, with the power to inspire passion.

In such quickened matter, we can create objects, and therefore contingent fulcrums as needed or desired, because objects emerge in the substrate in the course of the

Figure 8.5
Navid Navab and instrumentalist (Coaticook).

Figure 8.6
Ouija experiments in collective gestures. Still from video.

Figure 8.7
Complicated versus rich lifeworlds. Photos by the author.

world's magmatic, topological dynamics powered by the imaginary. This profoundly motivates *continuous*, field-based modes of articulation in a dynamical plenum, rather than object-oriented or ego-oriented design of objects in vacuum. Let me just indicate the motivation for continuity (or in a word, topology) in three points: philosophical, experiential, and technical. First, I conjecture that the topological is the primordial to the temporal in a sense for which Heidegger seems to have been reaching in his later work (such as the *Metaphysical Foundations of Logic*, 1978). Second, *pace* quantum mechanics and its vulgarization as the digital episteme, my experience of the world at the basic level is continuous. As I walk toward you, you do not flicker in and out of existence, at least not in my ordinary experience. As I move my hand and flex my fingers, they do not jump from place to place and moment to moment, but move in nuance continuously. And third, as I have argued elsewhere, despite what we have been given as the ground of technologically mediated life, our built world can be rich rather than complicated. Our task as engineers and architects is to discover how. And that is another aspect of the research creation of the Topological Media Lab.

It is often the case that poetry can leap over the bridgework patiently established by philosophy. In 1938, Dylan Thomas wrote:

The force that through the green fuse drives the flower
Drives my green age; that blasts the roots of trees
Is my destroyer.
And I am dumb to tell the crooked rose
My youth is bent by the same wintry fever.

The force that drives the water through the rocks
Drives my red blood; that dries the mouthing streams
Turns mine to wax.
And I am dumb to mouth unto my veins
How at the mountain spring the same mouth sucks.

The hand that whirls the water in the pool
Stirs the quicksand; that ropes the blowing wind
Hauls my shroud sail.
And I am dumb to tell the hanging man
How of my clay is made the hangman's lime.[10]

Ethico-aesthetic Play

Words, as categories, are handles on the "blooming, buzzing" cloud of experience (to borrow William James's description); they get their grip via concepts shooting sense-making tendrils through the loamy earth. In languaging, the earth reorients us. And conversely, in languaging we grip experience, we manipulate it. And we clarify or rationalize it with words, but at the expense of washing clear the dirt and leaving

these handles swinging clean but free of any friction. This frictionlessness, resulting from the clarification afforded by systematization and dematerialization, also evacu- ates sense and value.

Poets by and large do not rely merely on neologism: to say something "new," they use, in fact, the very same vocabulary that we all use in our everyday language. Poets do not have to invent new words à la Lewis Carroll. Fresh poetry from old vocabulary— continuity allows infinite degrees of freedom and, even in a precise sense, a larger order of infinity than the infinity of n to $n + 1$. This additional aspect of continuity is what yields dynamic novelty in Whitehead's or Bergson's versions of ontogenetic process.

Revisiting Archimedes on the lee side of the twentieth century, we can no longer expect to be given the fulcrum of the world or of language. But neither shall we need to. Nor should we, need we, seek their origins, *pace* Derrida's particular use of Husserl's essay on geometric intuition. In place of those modernist and postmodernist projects, one can begin to see a more immanent mode of resistance and weedy generation in the muddy interstices of our technologies of performance: the mode of play. Play can articulate the make-believe, the as-if, making fictive, becoming other than what is the case, the exfoliating art that drives the green fuse all the way down and up again. But in recent years, play has been harried by many who would classify it, barely escaping the nets of those taxidermists who would like to stuff play into the carcass of game. What our play spaces could offer us are not allegories of other worlds, whether cos- mological, political, religious, or psycho-fictive, but events affording playful processes that open life up to more life. Let me close by suggesting a few senses of play that may merit but also escape more careful consideration. There's the play of water lapping against the side of the boat, making the lazy slapping sound that evokes sunlight and fish in the clear water just beyond the reach of your fingers. There's the play, the empty space, between the teeth of interlocking gears, without which the entire assem- bly of gears would lock up; the teeth guarantee discrete synchrony, but it's the gap that allows movement to be born. And yet that gap is never a vacuum, because the world's structures are always and everywhere part of the substrate magma of the world. There's play in the sense of continuous, infinite-dimensional variation from any given trajectory, that articulates arbitrary degrees of novelty. And there's play as the endless deferral of definition, a passionate sense making that develops ever more virtuosity in reenchanting the world.