FCJ-055 Prosthetics Making Sense: Dancing the Technogenetic Body

Erin Manning, Concordia University, Montréal.

Explorations of new technologies and dance, led by Mark Coniglio, Scott de Lahunta, Antonio Camurri and others, focus on the difficulty of locating gesture-as-such. One key to developing sensitive software is understanding — and embedding into the software program — what a gesture is. In a recent paper, Scott de Lahunta suggests that the best way of coming to an understanding of gesturality is to work collaboratively with dancers such that 'the choreographic and computational processes are both informed by having arrived at this shared understanding of the constitution of movement.'[1] A similar tendency is expressed by Mark Coniglio when he suggests that live performance work must 'delve beyond direct mapping and the metaphor of a musical instrument; to building systems that could better sense qualities of movement; to represent something of the "gestalt" of movement'[2]

An engagement with the technogenetic body demands an encounter with the syntax of the moving body. For the practitioners of dance and technology the exploration of movement is intrinsically related to how to locate where a movement begins and ends in order to map its coordinates within a sensitive system. Yet, the question "What is a gesture? (and how can the computer recognize one?)" may not actually lead in the direction proposed by Coniglio and de Lahunta. Rather, it may direct the techno-dance process toward establishing a kind of grammar of movement that would — paradoxically — be more likely to tie the body to some pre-established understanding of how it actualizes. "Mapping" gesture risks breaking movement into bits of assimilable data, of replicating the very conformity the computer software is seeking to get beyond. Instead of mapping gesture-as-such, this paper therefore begins somewhere else. It seeks to explore the technogenetic potential of the wholeness of movement, including its "unmappable" virtuality. The unmappable — within a computer software program — is the aspect of movement I call pre-acceleration, a virtual becoming — a tendency toward movement — through which a displacement takes form.[3] If a vocabulary of gesture is to be reclaimed as part of what can be stimulated in the encounter between dance and new technology, it must be done through the continuum of movement, through the body's technogenetic emergence in the realm of the virtual becoming of pre-acceleration. Gesture-as-such (defined as extensive displacement of body parts divisible from a wholeness of movement) causes an imposed stability and holds back the potential of a sensing body in movement's capacity for innovation.

Scene 1: The Dance

A dancer walks across the stage. She wears sensors on her arm. Behind her is a large screen. Connected wirelessly is a software program that orchestrates input and output according to a computational relationship between displacement and its transformation into sound and video image. As she moves, the software generates a reaction in the environment. The movement has to extend beyond the body's virtual center: the software can more easily detect displacement that occurs at the body's extension. The displacement must be registered by the program as a gesture-in-itself. An almost-virtual or pre-actual movement out of which a displacement is born (a pre-acceleration of the movement) cannot be detected by the software. A visible (fully actualized) movement is necessary for software detection, usually a displacement either of a limb or of the whole body across space. Depending on the software, this movement triggers an image or recomposes a sound (slows it down, speeds it up, generates it). This usually happens in the "real time" of the dancer's movement. The spectator is invited to participate in this intermedia experiment.

The challenge is how to keep the participant's attention on the quality of the movement. In a situation where the dance modulates sound and image in real time based on extrinsic movements of a dancing body, attention shifts from the qualitative to the quantitative. Because of the system's prosthetic apparatus and its emphasis on subjecting the dancing body to its parameters, the participant's attention tends to be drawn to the workings of the system rather than to the movement's qualities. We catch not the dancer's preacceleration in its present-passing, but the ways in which her movement stimulates a transformation of the video image. We want to know when and how the music modulates and due to which kind of movement. We watch the dancer for

this shift, trying to locate the specificities of the technology and its gestural syntax. This concern for the technology soon situates the dancing body as a pre-formed organism onto which the technology is grafted. The question shifts from “what can a body do” to “what can technology do.” The experience of the dance performance is directly related to the limits of the system. The body movement is reduced to bits. Gestures are “pulled out” (prehended) from the movement rather than contributing to its experiential wholeless. Attention is distracted from the subtleties — the virtual pre-accelerations of the moving body — and what stands out is actualized displacement in the service of the software. The dancer responds by accentuating the extremity of the movement to help the system catch on.

6 This dance-event is typical of many of those situated at the nexus of dance and new technologies. [4] In such cases, technological experimentation involves a body whose movements trigger a system that can read certain kinds of displacements and translate them. These technological systems operate prosthetically and are often attached to the human body. They operate on the basis of the more-than, “enhancing” a dancing body’s capacity to create spacetimes of experience. These dance/new technology experiments emphasize how digital technology can foreground previously untapped dimensions to the moving body, creating a body that is sensually emergent, alive with image and sound. But are these new technologies really opening up the body to its technogenetic potentiality? Can the vocabulary of the prosthetic actually re-generate the moving body toward sense modalities otherwise untapped?

7 The prosthetic suggests a vocabulary of the more-than. Within this vocabulary, the “than” — the body, usually — can only be thought as an already-formulated entity. Concepts such as the machinic (Deleuze and Guattari[5]), the Body without Organs (Artaud[6]), the posthuman (Hayles[7]), and originary technicity (Derrida[8]), explicitly challenge the notion that the body could be reduced to a than-ness that would need to be supplemented to create a body that was more-than its organic envelope. They suggest that a body is always already more-than, refuting the logic of the “than” that would need to be prosthetically enhanced to reach its “more than” state. Refuting the “than-ness” that supposedly becomes prosthetically enhanced, these concepts suggest that the “more than” is the very condition of the becoming-body.

8 What we “see” in dance/new-technology performances is often a prosthetically-enhanced body. Such a body performs its improvisation supplementarily, contributing technologically to the stage-space through a transformation of video and sound. This transformation tends to occur at the level of representation. We see a change in space (the image shifts), but do we feel space differently? The logic of the prosthesis as it is mobilized in this kind of dance trend rarely moves beyond the limits of interactivity.[9] It produces mediations between different systems whereby one portion of the system is always already pre-constituted. In most cases this means working with a stable body-concept. It is the than-ness of a body that is supplemented by the shifting technologies. From stable to unstable and back, but never really metastable. New ecologies of experience are rarely created under these conditions.

9 Experiential transformation is rare. It depends on the capacity to create events that are “new” enough that they catch our attention and familiar enough that we can relate to them. “Relate” is the key word here: we must feel them in their eventness. To simply watch an event — to remain a passive spectator to its inner workings — does not result in experiential transformation. Transformation must entail a shift in affective tone such that the participating spectator feels the performance, responding to it through an emphasis as much on its duration — its capacity to create experiential spacetimes — as through its content. New technology and dance performances do suggest the capacity to produce platforms of interaction that can call forth new kinds of process that will in turn create new kinds of events. Yet their “process” is limited by the dimensions of the software which tends to call forth a docile body, both in the software-conformist dancer and in the technologically-attentive spectator. Affective transformation depends on evolution in the machinic system such that both bodies and technological systems are altered. Transduction: the process develops according to a dynamic not of interactivity but of relation.

10 The body-system reconstitutes itself as infinitely more-than, an n+1 that is in excess always of what either the body or the software could do alone. Transduction (a change not only of state but of dynamic) can only occur through an embedding of a kind of analog process into the dimensions of the technology’s potential. The shift is affective as much as it is quantitative. The analog is key to

this process because unlike the digital, the analog always has chance embedded in its open system. The body is always more-than. This more-than takes the form of virtual effects contaminating the body's actuality. This virtuality is not available to digital computation, which must conform to actual ones and zeros. By bringing the analog into the digital mix (by intermixing new technologies with dancing bodies such that the dancing body is emergent with the technology rather than simply added to it), the technical system might tend toward ontogenesis, toward technogenetic evolution.

11 Evolutionary systems that build on accumulation rather than on one-to-one effects are still very rare in the dance world, where the analog continues to pay tribute to the digital. The body is restricted to its "thanness." The complex analog body is reduced by the prosthetic system to a passive interactivity, forced to conform to a pre-established definition of what a body can do. The body must move for the software. Here's the paradox: moving for the software means learning to move the software. The choreography is determined by the software, which qualitatively limits what a body can do. Where technology was supposed to open the body to a wider relational potential, it actually reduces its capacity to move spacetime. The dancer learns to traverse space rather than creating it. The dancer is moved to interact with the software in a closed system of cause and effect. What tends to emerge: a pedagogical exercise in moving software. For technogenesis to occur, the dance must surprise, moving beyond a closed-circuit interactivity toward relational eventness. For this to take place, recompositions of potential (movement taking-form through virtual recombinations shape-shifting into displacements) are necessary, activated not by an external source, but by the very ontogenetic system that is the sensing body in movement.

12 This is not a plea to return to a pre-technologized body, or to abandon a technologically-enhanced dancing body, but, rather, to explore the potential of technogenesis in relation to the sensing body in movement. To begin to address this question, a vocabulary of process is necessary. Process here means working with enabling constraints that create the conditions for ontogenetic emergence. To experiment with a digitally enhanced post-technologized body beyond the dichotomy of the organic/prosthetic is to ask what a body can do such that it is not the prosthetic that enables it — as a tool supplementing the imposed than-ness of the body — but the very more-thanness of the body that comes to the fore. It is to move beyond the prosthetic as an external category to the ways in which bodies make sense: to ask how technogenesis creates new modalities of sense.

13 Technogenesis — ontogenesis of the bio-technological not as a technical additive to the biological but as an emphasis on the originary technicity of the human — suggests a working vocabulary where the body is posited not as a stable category, but as a creative vector of experiential space-time. This requires that we think the body in movement (that we never dissociate bodies from the flux of micromovements of which they are composed), that we conceive of bodies both as worlds and as creators of the worlds that world them. To think a body in movement is not to locate the body in a pre-formed world but to conceptualize moving worlds as instances of interrelating bodies. Technogenesis defines bodies as nodes of potential that qualitatively alter the interrelations of the rhizomatic networks of spacetime in which they are ephemerally housed. These networks are not distinct from the bodies they instantiate: they are themselves sensing bodies in movement. Sensing bodies in movement are not discrete entities but open systems that reach toward one another sensingly, becoming through these relational matrices. As these bodies individuate relationally, they evolve beyond their ontological status, becoming ontogenetic. Technogenesis is the dynamic becoming of the sensing body in movement.

Scene 2: Whitehead begins to dance

14 To move is to create (with) sense. A body perceives through difference. A change in environment provokes a sensory event. In Alfred North Whitehead, perception is both sensuous (sensed) and non-sensuous (a direct perception of the past in the present). To perceive is not simply to accumulate sense-data, it is to directly sense relation as the virtual activity inherent in the taking-form of objects and worlds. It is not that a "subject" perceives a world, but that the world is pulled into subjectivity and vice versa. This activity of "pulling" suggests that there is no subject-position that precedes experience. Without an initial perceiving subject, a pre-formed body cannot exist. Worlding occurs in the process of a world becoming subject or a subject becoming world. Or, to

extend the analysis, subjects are transitory individuations in a processual worlding whereby certain actualities take form in a nexus of "contemporarily independent" events.[10]

15 To understand the stakes in this argument, it is necessary to think actuality in terms of the stop-gap of perception: about a half second. What we perceive, we perceive always at a delay[11] such that this perception is already composed of the holes of experience. I do not perceive an object per se, the objectness is prehended (drawn out from a pastness in a way that is qualitatively new) as an event that spacetimes me. Through the prehension, "I" am subjectified as an instance of that particular object-event. This object-event constructs me — individuates me — as much as it is individuated by me. This experience is an actively creative one: "I" must assist the perception, fill up its holes, give it form. This giving-form happens as "I" (as individuating event) fill in the gaps of perception, giving the object a contour or a background (that I may not directly have perceived), situating it in a worldness that cannot be separated from it. As "I" do this, "I" am also individuating (moving beyond any kind of discrete "I-ness" or "than-ness") on a plane of becoming that Whitehead calls an actual occasion. "I" am not detached from this process and yet "I" am only composed by it to the extent that it will initiate my infinite re-composition.

16 To explain this strange refraction of experience, whereby "I" individuate in direct engagement with the individuating world, Whitehead turns to two concepts which sound very familiar — appearance and reality — , redefining them through his vocabulary of process and event. He does this to attempt to dislocate the notion that experience is a subset of an already formed body-world. For Whitehead, the world only pre-exists in so far as its pastness (its virtuality) can be activated in the present. To activate does not mean to conceive the past as a world strangely available to an unsuspecting present. Activation here is much closer to a Bergsonian concept of active recollection.[12] It suggests that the present — which, as I mentioned above, is composed of a very short duration — is propelled by an experiential pastness. What we call the present is composed of strands of pastness recomposing and perishing through it. This does not mean that all presents are predetermined. Quite the contrary: the present is always new, but its newness is compelled in large part by experience as it is reactivated or re-collected from the past half-second of experience. To reactivate is never simply to relive. There is no world that will remain the same after reactivation. Reactivation will always, to some degree, mean invention.

17 To arrive at the difference between appearance and reality, Whitehead turns to the concept of "actual occasions." The actual occasion is similar to the Deleuzian concept of the event. It refers to 'drops of experience, complex and interdependent' where each actual occasion is 'analyzable in an indefinite number of ways' (1978: 18,19) and must be perceived as such. Focusing on perception (prehension) as an activity allows Whitehead to by-pass the passivity of a vocabulary of preformation (where perception is contained by a pre-formed world). Prehension is perception as event.

18 An actual occasion is the expression of a particular prehension — or set of prehensions — that converge into what Whitehead calls a "subjective form." The "subjective form" is not the form of the object itself, but the very ontogenetic process out of which its objectness — its eventness — comes to the fore. We never prehend an object as such. The objectness of the prehension forms in the eventness that is the actual occasion. Objects emerge in relation as events of experience. As an object begins to take form, its process "concresces" such that it becomes more stable (and recognizable as such). This (meta)stability (the object having reached its eventness or "subjective form") is the beginning of the perishing of the actual occasion, whereby an opening is created for adjacent experience. As the actual occasion perishes, it populates the nexus of pastness out of which new experiences will emerge. The nexus as such cannot be perceived. But parts of it can (and will) be reactivated in future-past actual occasions.

19 This virtual nexus is how Whitehead defines reality. As the actual occasion perishes to give way to the next actual occasion (having reached its "concrescence" through the becoming of its "subjective form") the actual occasion melds into a reality virtually populated by all of the positive (having been actualized) and negative (having remained inactivated or virtual) prehensions that make up our experiential worlds. This nexus of perished actual occasions — reality — can be thought as a wealth of potential out of which possible worlds emerge. Reality is therefore always more than and less than appearance: less than what appearance can be, and more than

appearance is. Reality must be activated and can only actualize in the portions that appear. And even then, it is not strictly "what it was" but "how it can become."

20 To think the body in these terms is to focus on the body's unactualized potential as an aspect of its becoming that cannot be realized as such, but can be called forth, adding novelty to its open system. The taking-form of an individuating body is an "appearance" of the body within a vastness of unrealized potential. Technogenesis occurs at the threshold of emergence of the becoming-body where reality is pulled into appearance and something is added to the mix. This something is a movement-with that provokes a body to become in excess of its organ-ization.

21 Novelty — or creativity — occurs always in the present. Because the present takes form on the threshold of appearance and reality, the present must be conceptualized as operating in the midst of virtual causality becoming actualized. This virtual causality is the capacity to prehend that which is not yet actual (the virtual, or pastness) such that this non-sensuous perception emerges sensuously (in appearance). Novelty emerges through the causal relation between reality and appearance. Reality contributes to appearance by bringing experiential pastness into the present. This experiential pastness transduced into the present brings a certain causal (pre-experimented) element to the event of perception. Whitehead calls this aspect of perception "causal efficacy" in order to remind us that what we perceive first is not an object but its pastness or its capacity to exist in relation. This causal aspect of perception is the directly perceived relation between objectness and world. Activating perception means activating the relation that underlies the object's very capacity to be perceived. To prehend an object is therefore first and foremost to prehend how it fits into experience. Causal efficacy is the active causal link between objectness and experience that allows the object to take form experientially.

22 The pastness of experience — reality — creates the potential for future connections. This futurity-in-the-past assures an active linkage between perception and event that makes prehension intelligible. The perception of a chair, for instance, is a sitting perception. What is experienced in the prehension "chair" is not first its sensuousness — its woodness, its redness, its softness — but the causal relation between chair and world. The "object" will initially be perceived as the relational potential between chair and sitting whereby the sitability will in fact become the object. Of course, the chair may not fulfill this expectation: the chair may be missing a seat, may be purely decorative, may be a mirage. The pastness that allows for perception's intelligibility can fail us, and when it does, new worlds — new actual occasions — will in turn make new kinds of activation — new kinds of appearance — possible.

23 In most organisms[13] , to causally prehend is only one aspect of perception. Whitehead describes a concurrent "second" process, which he calls "presentational immediacy." In this "second stage" (though never quite second, since in higher organisms it can barely be thought separately from causal efficacy), perception is enhanced by the quality of experience. Now the redness of the chair emerges, a quality that is, strictly speaking, completely unnecessary to the experience of sit-ability. Yet, presentational immediacy is lost without causal efficacy[14] : despite the heterogeneity of its experiential dimensions, "pure" presentational immediacy cannot comprehend or delineate an event. Pure redness remains meaningless in this context without the causality that constitutes chairness. Qualitative difference must be associated with causal efficacy's capacity to create a relation between event and world. Pastness is necessary for perception, even if that pastness does nothing but invite the creation of an object-world relation to be deformed in the next prehension. Novelty emerges from the productive constraints of the pastness of worldings in the present-passing. Presentational immediacy is what adds nuance to the mix. Without presentational immediacy, the world loses a key aspect of its potential subtlety. As with the intertwining of appearance and reality, what we know as perception is similarly a complex intermixing of causal efficacy and presentational immediacy.

24 Appearance is the active pulling out of experience from reality, the "giving form" of the nexus in the future-pastness that is worlding. Reality must in a certain sense "precede" appearance: what appears is always less complex that reality itself. Yet reality can never be prehended as such, and, in that way, remains undifferentiated. Appearance and reality thus exist on a continuum: perception happens always for the first time through the duration of appearance, and yet this duration is only possible because of the activation of reality. To experience is always to exist durationally: it is to co-live the present as a pastness of emergence that will only be known in its

future-pastness-becoming-present. There is no moment that precedes the prehension out of which perception occurs: the future and the past co-exist through the present.

25 With prehension foregrounded as the key to the eventness of experience, appearance and reality can no longer be delineated as hierarchies of objectivity and subjectivity. Rather, we begin to conceive the eventness of an actual occasion as that which embodies different layers of duration that lead toward nodes of perception. Sensing bodies in movement emerge ontogenetically from such durational interweavings.

Scene 3: Dancing the Ground

26 A dancing body is an example of a sensing body in movement. A dancer prehends spacetime, actively perceiving and moving worlds such that new kinds of experiential spacetimes are constituted. These worldings are pullings out of an experiential ground that shifts with each of the dancer's movements. The dancer senses and creates spacetime in one and the same movement, individuating with each shift in ground. The ground thus becomes part of the shifting through which these individuations develop, emerging as a key aspect of the actual occasion that is the taking-form of movement. As it enters into movement, the ground is reconstituted as novelty, intertwining with the capacities of what a gravitational body can do. The ground emerges as an enabling constraint: the dancer will always reach the ground again, but this reaching will be inflected by a towardness that will continually change the dimensions of the space as the ground emerges into a verticality, a vorticality, a hardness, a horizontality. The ground moves (with) the dance. The ground in relation to movement takes part in the creation of becoming-form (a curve, a spiral, an arabesque) whereby movement achieves its subjective form, a subjective form always intrinsically related to a moving ground. The ground thus contributes to the dance as a form-finding element in the dancer's shape-shifting process, operating not as a stable entity but as an active determinant in the process. The ground is a compositional aspect of a dancer's movement, reconstituting the ways in which spacetime potentializes the moving body and vice versa. The ground does not simply ground, it dances.

27 A dancing ground is a technogenetic element in the dance. A technique of composition, the ground becomes a condition of emergence for the ontogenetic body. Techniques conceived this way are technologies composed with, for and through a dancing body. They foreground the more-thanness of the body. A body is not a technique, but a technique can create a body. The dancer's body is qualitatively different from a body walking to the bus stop because of the variety of techniques that make up the dancing body. The dancer moves not toward a destination, but toward her capacity to shapeshift. This is a key aspect of technique: the dancer learns to continuously relocate the ground as an element of experimental spacetime, creating momentum with and through the ground toward gravity-defying revectorization.

28 To ground, when dancing, is to alter the composition body-floor such that the ground actively relocates in relation to dynamic movement. Movement is never a movement-in-space. It is a movement-of-space that qualitatively alters the durations of experience. To say that the ground is "beneath her feet" is to misunderstand the very mobility of groundedness.

29 There is link to be made here between the dancing and the walking-to-the-bus-stop body, even if the same kinds of technique are not foregrounded. The shiftiness of ground may be less palpable with respect to a walking body rushing to a bus-stop, but is nonetheless virtually present: you might, for example, experience a "loss of ground" due to a shift in the level of the sidewalk that causes you to lose your balance. The dancer is trained to defy the ground as stable surface, whereas the walker depends on the ground's stability. But that does not mean that the ground necessarily conforms to the expectations of the walker.

30 Shifting grounds are but one way in which a body creates spacetime. Dancers — like all other movers, only more obviously — breathe space,[15] perhaps folding the space into the duration of a textured tactility felt on the skin. Dancers walk space, such that the dimensions of spacetime seem to compress. They sound space, such that the vectors inflect, curving experience. By creating such occasions of experience, the sensing body in movement alters experiential spacetime such that spacetime is felt in its emergence.

31 This emergence is already a technogenetic experience. It would be impossible to speak of experiential spacetime if we confined ourselves to the envelope of an organ-ized body. This

emergent process is technogenetic because it recomposes the body. This recomposition takes form through a multiplicity of techniques.[16] For Simondon, a technique is a technology of emergence (an ontogenetic technology or a technogenesis) through which new complex systems are composed. These techniques can be thought as associated milieus of potential. Associated milieus are in-between environments — ecological becomings — that emerge through the very technogenesis that gives them form. The associated milieu is the compositional matrix for the machinic body, in-forming the body through transductions that open the body-becoming to the metastability that provokes it to become in excess of its organism. Techniques matter form such that bodies become experiments in the making.

32 Can digital technologies create techniques capable of such technogenetic transduction? Transduction here is understood as a movement through and across systems of emergence through which individuations occur. This is not strictly a horizontal process, but a durational one whereby what is transformed becomes a worlding rather than an effect on an already-constituted system. Transduction alters the very conditions of a process. Can digital technologies create ontogenetic conditions for emergent body-worlds? Is it possible for new technologies to perceive the virtual effects of the taking-form from reality to appearance, to feel the incipience of movement, to sense-with the sensing bodies in movement, "catching" the body in its passing? Can new technology engage the virtuality of pastness, making its effects felt? This is not simply a question 'of the superiority of the analog'[17] but a question to technogenesis itself. Can technology play the virtual?

33 The virtual — pastness — is played by a dancing body through the body's pre-acceleration — the incipience of a becoming-movement that takes form when the body-world relation is moved. This non-sensuous perception — a pre-displacement that is felt like a movement on its way — is at the heart of the complexity of experience. It is this complexity that challenges digital technologies. Technology becoming technogenetic involves shifting the terms of prosthetic "more-thanness" such that the "more than" becomes the experiential starting point for the sensing body in movement. Rather than beginning with the "thanness" of the body, technology must work at the level of perceptual (sensuous and non-sensuous) emergence. Technology has to become body. By working ontogenetically — toward technogenetic emergence — rather than prosthetically, technology must becomes capable of actively making sense such that it creates new sensing bodies in movement. No longer held back by the limits of the software, movement might then be able to make the technological process appear rather than simply moving to its parameters.[18] To add nuance to these experiential experiments, technology must also make its failures felt, its lagging behind, it system collapse, its loss of ground. Making the digital analog need not be the goal: technogenesis becomes evocative when its techniques make transduction felt, foregrounding the metastability of all moving systems.

34 For such technogenesis to take form, Whitehead's distinction between appearance and reality must be taken into account. The appearance of a technogenetic body cannot be based on a body (an organic body, a dancing body) that pre-exists its ontogenetic emergence. The body must not be danced and then supplemented: it must dance its supplement. It must dance its novelty such that it introduces within the movement the mutability of the body's rhyzomatic networks of actuality and virtuality. A body is never wholly actual: it is always virtually what it will have become as it interweaves the organic and the technogenetic, where the organic is as much a technology of the senses as the senses are technologies of the organic.

35 A sensuous perception creates a novel extension that disturbs the machinic assemblage that is a sensing body in movement. To sense — to experience the world amodally[19] — activates the body's relation to the world and opens the body to its technogenetic potential. This occurs in the dancing body when the movement causes the room to space differently through an accumulation of tactile sensations coursing through the air. Felt affectively as a change in the dynamics of the environment, this kind of movement takes form with and through the dancer's body as a molecular reorganization of duration such that the dimensions of the felt are reexperienced in conjunction with the reassembling of a dispersing, re-cognizing becoming-body.

36 To feel time is to create space in the present. This requires an activation of pastness in the presentness of experience. It means we move spacetime into a passing present such that duration becomes experience. Whitehead calls this direct perception of "pastness" non-sensuous

perception.[20] Non-sensuous perception underscores the fact that perception begins relationally with an emphasis on the pastness that allows us to "know" the world. This pastness (that can be durationally as immediate as the present moment passing) enables us to form causal relations between past events and current circumstances such that we feel the world ecologically before we know exactly what it is. To feel ecologically is to directly perceive the relations out of which spacetime will be composed. Once these relations perceptually begin to take form, objects can be "pulled out" or prehended. Perceiving ecologically does not suggest giving meaning to form, but forming environmentally. To say we perceive nonsensuously — or ecologically — is to emphasize how the world creates modalities of perception even as our prehensions are creating worlds. Ecological durations are not linear — they are richly layered, their nexus ripe with reality, their environments populated by appearances. Whitehead calls forth this notion of non-sensuous perception in order to sidestep the tendency to think we make sense only with sense-data, challenging the theory of sensory-reception whereby an impulse "out there" is processed by a mediating brain/body function that makes sense of a pre-existing world.

37 We perceive not an object-as-such but how the object merges with experience. We feel its pastness even as we call it forth in its present appearance. This is non-sensuous perception. As mentioned earlier, instead of perceiving the chair-as-such, we perceive its sit-ability: the object becomes its sitability — the object is its experiential function. The sitability of the chair is rendered more complex by the analogous perception (presentational immediacy) that adds novelty to the concept of sitting by associating it with qualitative difference. 'The creativity is the actualization of potentiality, and the process of actualization is an occasion of experiencing' (Whitehead, 1933: 178). Objects are novel because their conjunctions are new, not pre-existing the object, but immanent to it. Objects, prehended, are individuations within an ecology of practices wherein perception is key.

38 Yet, perception is never limited to the perception of even such complex objects. It is always also an activation of a virtuality — a conjunction or a relation — out of which an event (an objectness, an individuating body) is composed. Non-sensuous perception is an activity of relation whereby the composition of an event takes place through a re-uptake of the virtual (pastness) into the actual (appearance). Through non-sensuous perception we directly perceive relation. In Whiteheadian terms, we prehend the affective tone — the relational concernedness — of an object.

39 A sensing body in movement is activated both sensuously and non-sensuously. Perception occurs on a continuum of relation. To make sense technogenetically, the coupling dance/new-technology must ask how a technology can make relation felt. This may be done, for instance, by working with a delay through which the room is durationally recomposed. Imagine, for instance, a dancer cutting across the space, shifting spacetime's tactile borders through a succession of movement-layers that compile a thick database that eventually alters the sound in the room. The sound is not altered by a given movement, but by an overload in the system. The sound can now be perceived as a sensory experiment technogenetically emergent with perception's own half-second delay. Experience is overlaid rather than delineated through a representation of movement=sound in a distinct one-to-one relation. Now, the system recomposes the room even as the dancer composes with the system. The coupling causes the room to shift, to move, to breathe. As this happens, the intensity of a shift in spacetime is perhaps felt. This is felt not through the sound shifting as such, but through a slight difference in affective tone. The room reverberates around its colour, its sound, its becoming-form. Now, the spectator feels a concern[21] for the space. This concern provokes a new kind of attention: a perception of the in-between. Relation is felt even if only in its effects. A new composition begins to unfold, one that may be related to an ontogenetic shift in the participating body of the spectator. Technogenesis. Two bodies recomposed at different durations in the sensing spectrum.

40 If technology can recompose a body beyond the level of sensuous perception — beyond the directness of an operation that makes something seen, such as an arm movement translating into a video image — technology becomes technogenesis. What is sensually transmitted — what the audience knows it can see or feel — is the datum of the experience. This is necessary to create an event, but limiting if restricted to its representation. What is crucial is the capacity to make the non-sensuous as well as the sensuous felt. The concern that comes with experience — its affective tone — calls forth more than the bits moving through the program or the movement becoming

image, image becoming sound. In a technogenetic event, more than displacement or representation must be perceived. What must also be felt — by the dancer first and foremost, but also by those participating in the performance as spectators — are the microperceptions through which the displacement is activated. Many of these perceptions are nonsensuous because they work at the level of the barely there, below the threshold of sensuous perception. Rather than the sensory perception itself, what we feel is the relation out of which it will emerge. The perception thus exists chiefly as concern. This affective experience cannot be separated from the creation of spacetimes the technogenetic event calls forth. Technogenesis contributes concern to the event which does not end with the performance: the affective tone's residue lingers, provoking adjacent forms of experience, many of which remain virtual. Technogenesis always involves more that the datum, more than the sense-presentation, more than the present. Technogenesis makes the process felt, foregrounding the duration of the individuating machinic body.

41 Technogenesis cannot be pre-mapped. How then can it work alongside a technological system whose parameters are so often set? The ontogenetic coupling of digital technology with the originary technicity of the individuating body must take this into account. Rather than mapping the technology — as a prosthesis — onto a moving body, it is necessary to incite the movement to appear out of the technological process that is the machinic assemblage of individuation.

42 To make the movement appear does not mean to restrict the movement according to the parameters of the technology. It does not mean to delimit gesture to limbs moving (because the motion sensor can better detect a large extrinsic movement, rather than a virtually invisible one). We require operations that traverse the spectrum of the technology's potential metastability in relation to a becoming-body. When technology begins to operate along this spectrum it forms an associated milieu[22] with the experiential in-betweenness that is the becoming-body. Technology not mapped-onto but emergent-with a body-becoming might make different durations felt along the strata that is the sensing body in movement. This would happen first not at the level of reality but through the presentness of appearance. The technology would have to function not as a system that takes over the moving body, but as a complex interface through which the technogenetic body can be moved to appear. The effect of this (dis)appearing body would eventually populate the nexus such that certain aspects of the technogenetic body could remain dormant, real yet virtual, embedded in a pastness accessible through activation. There is no doubt this already happens — but still too rarely. Techniques for technogenetic emergence must become part of the technology's interface. These techniques would thereby create new associated milieus never distinct from the ontogenetic body. For the associated milieu is always also the becoming-body, a technogenetic recomposition. Technogenetic technology would no longer be inserted into a body-system: it would be emergent with it.

Scene 4: Bus-Stopping the Ground

43 Let me return to my example of walking to the bus stop where I suggested that the ground's recomposition of the dancing body was simply an extreme example of the shiftiness of the everyday walking body's relation to ground. Whereas the dancing body specifically dances the ground, walking to the bus-stop is usually conceived as an activity that presupposes a stable ground. Yet, even walking to the bus-stop challenges the ground. It does so by immediately reconfiguring the body-ground series into a transportational vector. In advance of the walking, the bus-stop already appears as the propulsion for the walk. The ground-in-itself is backgrounded in favour of transportational (bus-oriented) momentum. The perception ground-body in this case is directly intertwined with the capacity for transportation. The ground still "contributes" to the walking, despite the fact that the transduction of ground into the steadiness of the walk involves a backgrounding of the ground in this instance. The backgrounded ground thus becomes a participant (rather than a coordinator) in the transportational vector that carries the movement. The ground "appears" only insofar as it is expressed as something else (steadiness of movement, for instance). This backgrounding does not mean that the ground is not active, but rather than it is not felt as such in the prehension.

44 The prehension "ground" is indissociably linked to the transportability of its becoming-function. It is not that ground is transport: it is that it appears in the function of transportability. As long as nothing gets in the way of this focus, the ground will continue to be backgrounded in the transportational vector ground-walk-bus-stop. But things are bound to get in the way: you smell

the garbage in the alley, which causes you to lose your footing and trip. Through malfunction, you lose your ground and the ground appears, foregrounded, horizontalizing you, altering your sense of spacetime. Suddenly, ground no longer contributes steadiness-in-movement. Face-down, you prehend hardness. The bus-stop is momentarily backgrounded. The event has shifted and with it the ground. Now you see your reflection in the puddle and this makes you feel self-conscious. You prehend a selfness that was neither part of the transportational vector nor of the appearing groundness. A new actual occasion begins to take form where the ground is once more backgrounded. You remember your lateness and you quickly rise and resume your walk. The ground re-enters the transportational vector, contributing to the hurriedness of the movement that will take you toward busness. The hurry is foregrounded now, but this does not mean that the ground has remained stable.

45 Each event creates a different ground. Spacetimes of experience are always linked to shifts in ground. Ground is part of the technogenesis that makes events felt. It is by adding new elements to the system that the system becomes metastable. Every appearance grounds differently. And every worlding makes sense: it creates sensory openings through which we move, and opens the way for movements through which we technogenetically invent worlds. These are not prosthetic openings, but the very making sense of the more-than that is the ontogenetic body.

46 What is real and what appears exist in a complex network of movement that senses, relays, organizes, discards, opens, closes. Each of these terms is relational. And each of these terms involves a gesture toward appearance. The key is remembering that gesture is never in-itself: it is relation, sensuous and non-sensuous, equal to emergence. Every experience occurs because it is prehended from a nexus that continually evolves, replete with potentiality. Beyond the current prehension lies the potential for the creation of new ecologies of experience. What a body can do is characterized by its capacity to make sense beyond a vocabulary of the prosthetic. An ontogenetic body has an infinite potential for technogenesis. New technologies must dance the body.

Author's Biography

Erin Manning is assistant professor in studio art and film studies at Concordia University (Montreal, Canada) as well as director of The Sense Lab, a laboratory that explores the intersections between art practice and philosophy through the matrix of the sensing body in movement. Her artwork is primarly devoted to painting and scupture. She dances Argentine Tango professionally and writes about it as relational movement. Her dance background includes classical ballet and contemporary dance. Publications include Politics of Touch: Sense, Movement, Sovereignty (Minneapolis: Minnesota University Press, 2006) and Ephemeral Territories: Representing Nation, Home and Identity in Canada (Minneapolis: Minnesota University Press, 2003). Her current book-project is called Moving the Relation: Sensing Across the Arts and deals with technogenesis and movement.

Notes

[1] The quote continues: 'This means descriptions (what we think of as co-descriptions) of movement that can exist in both its own terms (as in physical) as well as in the symbolic abstractions that are necessary in order to use these techniques of gesture modeling, simulating, learning, following etc. with the computer' (deLahunta, Scott. 'co-descriptions and collaborative composition', opening presentation at Choreographic Computations (a NIME06/IRCAM workshop), Paris, France, 4 June, 2006).

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[2] In deLahunta, Scott. 'co-descriptions and collaborative composition', opening presentation at Choreographic Computations (a NIME06/IRCAM workshop), Paris, France, 4 June, 2006).

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[3] For a more detailed exploration of preacceleration, please see Manning, Erin. 'Incipient Action: The Dance of the Not-Yet,' in Choreographesis Ed. Lynn Turner. (New York: Routledge, forthcoming 2007).

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[4] This is not to suggest that thought has not been given to these issues. Many very interesting and innovative software composers are currently working with dancers and choreographers to explore the potential of creative continuums between software and innovative dance. In his recent dance/new-technology composing, Scott de Lahunta calls this "choreographic compositions," suggesting that the choreography of the dance is entwined in the double process of composing software and creating movement. The exploration of new technology with dance has a history that can be traced to the 1960s with choreographer Jeanne Beaman and computer scientist Paul Le Vasseur who created computer generated choreography using an IBM 7070. This platform randomly chose a sequence of events from a list of movements. John Lansdown, an architect, similarly explored the potential of using the computer as an autonomous composer, rather than to support or augment the existing creative process. Merce Cunningham's methods are also well-known: the 3-D human figure animation software LifeForms continues to be used today and has been developed in innovative work by Trisha Brown and William Forsythe. According to de Lahunta, what is new about the recent current of dance and new technologies is how systems are being built in correspondence to a choreographic creative process with an emphasis on the 'shared understanding that emerges through the collaborative process. This is what we think to be both technically and creatively innovative' (deLahunta, Scott. 2006. 'co-descriptions and collaborative composition', opening presentation at Choreographic Computations (a NIME06/ IRCAM workshop), Paris, France, 4 June.). This paper does not seek to deny this important research, but to ask how such a process can or does become technogenetic.

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[5] For more on the machinic, see Deleuze, Gilles and Guattari, Felix. A Thousand Plateaus Trans. Brian Massumi. (Minneapolis: Minnesota UP, 1987). See also, Guattari, Felix. Chaosmosis, trans. Paul Bains, Julian Pefanis. (Indiana: Indiana UP, 1995).

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[6] For more on Artaud's concept of the Body without Organs, see Deleuze, Gilles and Guattari, Felix. A Thousand Plateaus, trans. Brian Massumi. (Minneapolis: Minnesota UP, 1987).

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[7] For a reading of the posthuman, see Hayles, Catherine. How we Became Posthuman (Chicago: Chicago Up, 2000).

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[8] Beardsworth is influenced by Jacques Derrida in his usage of originary technicity. It comes up in many of Beardsworth's texts. For an example of how he uses the term, see https://tekhnema.free.fr/3editorial.htm

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[9] For an analysis of interactivity, see Massumi, B et Dove, T. 'The Interface and I: A Conversation Between Brian Massumi and Toni Dove', Artbyte: The Magazine of Digital Arts (É-U), 1:6 (February-march 1999), pp. 30-37.

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[10] For more on the ways in which actual occasions are always contemporarily independent events, see Whitehead, Alfred North. Adventures of Ideas (New York: Free Press, 1933).

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[11] On the half-second delay of perception, see Whitehead, Alfred North. Adventures of Ideas (New York: Free Press, 1933). See also Massumi, Brian. Parables for the Virtual (Durham: Duke UP, 2002).

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[12] For an evocative reading of active recollection in Bergsonian thought, see Deleuze, Gilles. The Time-Image, trans. Hugh Tomlinson and Robert Galeta. (Minneapolis: Minnesota UP, 1991).

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[13] Whitehead defines organisms according to the perceptual capacities, making a difference here between what he calls "lower grade" and "higher grade" organisms..An example of a lower

grade organism engaged in perception would be the causal relation between flower and sun. See Whitehead, Alfred North. Adventures of Ideas (New York: Free Press, 1933).

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[14] For a case study of perception without causal efficacy, see Erin Manning 'Taking the Next Step: Touch as Technique', which explores the complex perceptual disorder in patients who suffer from post-encephalitic syndrome. Forthcoming in Mark Paterson Ed. 'Re-Mediating Touch' Special Issue of The Senses and Society (Oxford: Berg Press, 2007).

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[15] The idea of breathing space was evocatively brought forward by Michael Schumacher dancing in Christopher Salter's new piece entitled Thresholds. In this piece, Schumacher recomposes spacetime through the tactility of breath.

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[16] See Simondon, Gilbert. Du Monde d'existence des objets techniques (Paris: Aubier Montagne, 1969).

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[17] See the chapter of the same name in Massumi, Brian. Parables for the Virtual (Durham: Duke UP, 2002).

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[18] Stelarc's work is evocative in relation to technogenesis. For a stimulating reading of his work, see 'The Evolutionary Alchemy of Reason' in Massumi, Brian. Parables for the Virtual (Durham: Duke UP, 2002).

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[19] The amodal suggests that we sense across sense modes. The concept of "amodal completion" is developed by Albert Michotte. See his essay in Thines, Costall, Buttersworth Ed. Michotte's Experimental Phenomenology of Perception (Hillsdale, N.J.: Lawrence Erlbaum, 1991).

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[20] See Whitehead, Alfred North. Adventures of Ideas (New York: The Free Press, 1933) pp. 180-181.

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[21] The concept of concern is central to Whitehead's work and connotes a capacity to feel the affective tone of the becoming-world as a direct experiential perception. Whitehead writes: 'The occasion as subject has a "concern" for the object. And the "concern" at once places the object as a component in the experience of the subject, with an affective tone drawn from this object and directed towards it' (1933: 176).

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[22] For a more in-depth analysis of the associated milieu, see Simondon, Gilbert. Du Monde d'existence des objets techniques Paris : Aubier Montagne, 1969.

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