

Maxine Sheets-Johnstone

Kinesthetic Memory

This paper attempts to elucidate the nature of kinesthetic memory, demonstrate its centrality to everyday human movement, and thereby promote fresh cognitive and phenomenological understandings of movement in everyday life. Prominent topics in this undertaking include kinesthesia, dynamics, and habit. The endeavor has both a critical and constructive dimension. The constructive dimension is anchored in Luria's seminal notion of a kinetic melody and in related phenomenological analyses of movement. The dual anchorage stems from the general fact that kinesthetic memory is based on kinesthetic experience, hence on the bodily felt dynamics of movement, and on the particular fact that any movement creates a distinctive kinetic dynamics in virtue of its spatio-temporal-energetic qualities. The critical dimension focuses on constructs that commonly anchor discussions of movement but bypass the reality of a kinetic dynamics, notably, Merleau-Ponty's "motor intentionality," and the notions of a body schema and body image. The pointillist conception of movement and the Western metaphysics that undergird these constructs is examined in the concluding section of the paper.

Luria's Kinetic- and Kinesthetically-Informed Neuropsychology

Russian neuropsychologist Aleksandr Romanovich Luria is regarded "a founding father of neuropsychology" (Goldberg 1990), lauded for his insights and meticulous clinical research (e.g., Teuber 1966, 1980; Pribram 1966, 1980). He describes movement pathologies as disturbed kinetic melodies; everyday movement no longer flows forth in effortless ways, or indeed, is no longer even a possibility for patients with brain lesions. In *The Working Brain*, Luria describes how kinetic melodies are constituted, using writing as an example. "In the initial stages," he observes,

writing depends on memorizing the graphic form of every letter. It takes place through a chain of isolated motor impulses, each of which is responsible for the performance of only one element of the graphic structure; with practice, this structure of the process is radically altered and writing is converted into a single 'kinetic melody,' no longer requiring the memorizing of the visual form of each isolated letter or individual motor impulses for making every stroke (Luria 1973, p. 32).

He later specifies how voluntary movement is a "complex functional system," fulfilled in "the perfect performance of a movement" on the basis of four fundamental conditions: (1) "*kinaesthetic afferentation*," (2) a system of "*spatial coordinates*" centered on "the visual and vestibular systems and the system of cutaneous kinaesthetic sensation," (3) a "*chain of consecutive movements*, each element of which must be denervated after its completion so as to allow the next element to take its place," and (4) a "motor task" which at more complex levels of conscious action "are dictated by *intentions*" (ibid., pp. 35-37). At the neurological level, voluntary movement is thus the orchestrated result of "completely different brain systems" (ibid., p. 37) that work together in such a way that a kinetic melody unfolds.

Of singular significance is Luria's recognition that voluntary movement is not just a spatial phenomenon but a *temporal* phenomenon. Luria in fact distinguishes between the temporal and spatial distribution of motor impulses in terms of the premotor and postcentral cortical zones, respectively, noting specifically that the premotor zones of the brain "are responsible for the *conversion of individual motor impulses into consecutive kinetic melodies*" (ibid., p. 179). Earlier, he pointedly emphasizes that "Movement is always a process with a *temporal course*" that "requires a continuous *chain of interchanging impulses*" (ibid., p. 176). In this context, he reiterates in more general terms his descriptive account of the origin of kinetic melodies: "In the initial stages of formation of any movement this chain must consist of a series of isolated impulses; with the development of motor skills the individual impulses are synthesized and combined into *integral kinaesthetic structures* or *kinetic melodies* when a single impulse is sufficient to activate a complete *dynamic stereotype* of automatically interchanging elements" (ibid., p. 176). He later specifies that the construction and performance of any complex movement depend on:

1. an intact frontal lobe, or what he designates an intentional "brain zone";
2. kinesthesia, or what he designates an "*integrity of its [the movement's] kinaesthetic afferentation*";
3. a temporal organization, or what he designates a "constant regulation of *muscle tone*... and a sufficiently rapid and smooth *changeover* from one system of motor innervations to another, with the formation of complete *kinaesthetic melodies* in the final stages of development of skilled movement" (ibid., pp. 251-53).

With respect to the latter requirement, Luria emphasizes the necessity of the second requirement - kinesthetic afference - citing physiologist Nicholas Bernstein's detailed studies of movement and its fundamental "degrees of freedom" (Bernstein 1984, 1996)). As he points out, the degrees of freedom in human movement and the constantly changing tone of the muscles "explain why it is that, in the performance of a voluntary movement or action, although the motor task preserves its regulatory role, the highest responsibility is transferred *from efferent to afferent impulses*" (Luria 1973, p. 249). Kinesthesia is thus of maximal significance; successful voluntary movement and the formation of "a complete dynamic stereotype" depend on it.

Though not explicitly specified in this way, kinetic melodies are inscribed in the body. They are "*integral kinaesthetic structures*" (Luria 1973, p. 176) and are thus essentially, i.e., in a living, experiential sense, not brain events but corporeally resonant ones, in-the-flesh dynamic patterns of movement that are *initiated* - and run off. The most basic of kinetic melodies, ones that might be called fundamental melodies of life - if not fundamental melodies *for* life - are forged in the course of infancy and childhood, some of them beginning in prenatal life (Luria 1980, p. 192). In each instance, they are kept alive by kinesthetic memory; their inscription in the body is by way of kinesthetic memory, which is to say by way of distinctive movement dynamics. Thus, in normal everyday adult life, a kinetic dynamics unfolds that is at once familiar and yet quintessentially tailored kinetically to the particular situation at hand: a familiar but distinctive kinetic dynamics unfolds in articulatory gestures as we speak, in repetitive downward swoops of our arm as we hammer, in subtle, varying shifts of direction and bendings of our body as we move quickly forward along a crowded sidewalk. The familiarity of these dynamics is grounded in invariants, invariants of speech, of hammering, of weaving a path around obstacles. Their tailoring is grounded in the particular situational vagaries found in the present experience: feeling ill at ease speaking to this particular person, hammering with this new hammer, weaving our way on this icy sidewalk.

Kinetic melodies that are inscribed in our bodies are dynamic patterns of movement. They constitute that basic, vast, and potentially ever-expandable repertoire of "I cans" (Husserl 1970, 1973, 1980, 1989) permeating human life: walking, speaking, reaching, hugging, throwing, carrying, opening, closing, brushing, running, wiping, leaping, pulling, pushing. The basic kinetic repertoire is virtually limitless, being constrained only by age, inclination - and pathology. Its sequential complexity and intricacy are similarly virtually limitless, not only with respect to everyday "I cans" such as writing and tying knots, for example, but with respect to dancing, diving, skiing, performing surgical procedures, administering medical courses of action, learning artistic modes of applying paint and of sculpting a piece of wood, and so on. In each instance, knowledgeable ability is not simply a know-how, a lesser

form of knowledge that is “merely physical.” Kinetic melodies are saturated in cognitive and affective acuties that both anchor invariants and color and individualize the manner in which any particular melody runs off.

Luria’s concept of kinetic melodies is an experientially-based concept rooted in the kinetic dynamics of life as normally lived. “Kinetic melody” thus describes *an experienced kinetic event*, writing one’s name fluently, reciting the months of the year, solving an arithmetical problem (Luria, e.g., 1966, p. 226; see also below). What is ruptured by tumors, hemorrhages, or brain lesions ruptures a normally *dynamic* life, a life of meaningful movement and of ease in movement. When Luria at one point characterizes a wounded patient as suffering an “*adynamia* of psychological processes” (ibid. pp. 224-26), he quotes the patient’s own reflections on his wound, reflections that show clearly that the patient’s psychological *adynamia* is played out kinetically. The patient withdrew for weeks into idleness - “[I] just lay idly in bed” - and social indifference, not writing or speaking but “behav[ing] as if I were alone, or by myself, and with nothing to care about” (Luria 1966, p. 225). “My comrades,” he remarks, “even took me for a deaf-mute” (ibid., p. 224). In the most fundamental sense, his *adynamia* is corporeally represented (for more on corporeal representation, see Sheets-Johnstone 1990). It is indeed significant that his *adynamia* begins to lift only with a resumption of movement: “Only after six weeks, when I began to do exercises, did I write my first letter” (ibid., p. 225). It is as if he needed to reawaken himself *kinetically* - to his tactile-kinesthetic body and to *kinesthetically felt dynamics* - before he could rekindle the “kinetic melody” of writing.

Smooth kinetic melodies nevertheless proved beyond this patient. In particular, he was not able to carry out serially coordinated movement. In Luria’s words, “The formation of a skilled movement in the form of a smooth ‘kinetic melody’ met with insuperable difficulties” (ibid., p. 231). What is more, arithmetical calculations, which were formerly within his province, were no longer so. Luria notes that “Despite the differences between these [arithmetical] disturbances and the disturbances of skilled movements described above, they have one common feature: In both cases we are dealing with a disturbance of the smooth, automatized performance of complex operations.” (ibid., p. 256). In short, what was beyond this patient was *complex sequential activity*, including not only arithmetical calculations but coherent narrative speech. The effects of the lesion were thus spread out over a variety of activities and took several forms - “complex, smooth *skilled movements*,” “*intellectual operations*,” coherent narrative speech (ibid., p. 290) - but all were rooted in a common thematic: complex sequential activity. It bears emphasizing that Luria’s concern with complex sequential activity, hence with the *temporality* of movement, pervades his detailed neurological studies, and that, in consequence, animate movement is recognized not merely as a spatial phenomenon - movement with respect to a particular situation - but as a spatio-temporal one.

Luna's descriptive accounts of disturbances in kinetic melodies and of their linkage to pathologies in *brain zones* (Luria 1973) constitute the basis for fundamental neurological understandings of human movement, that is, understandings of how pathologies impede or obliterate dynamic patterns of movement that are the bedrock of everyday human life activities. Given the acuity of his observations, his extraordinarily comprehensive clinical and experimental studies, and his central concern with movement, it is curious that his work is not mentioned in present-day studies of movement, if not by cognitivists, then by dynamic systems theorists. Although the latter's perspective is broader - ecological kinetics of organism-environment relations - and their aim narrower or reductive - mathematical formulations of movement or "law-based" principles (Kugler and Turvey 1987, e.g., p. 6) - and although kinesthesia is totally eclipsed by "information" and an experiencing subject virtually discounted (cf. Wilberg 1983), there is nonetheless a basic kinship. Kelso's "dynamic patterns," for example, in spite of being analyzed in radically different terms (Kelso 1995), are descriptively riveted on movement in the same way Luria's kinetic melodies are; both centralize attention not on objects in motion but on movement itself, and, in particular, on coordinated movement. Moreover Luria would agree with Kugler and Turvey that movement is not "a complex *thing* put together from simpler things" like a reflex (Kugler and Turvey 1987, p. 405); it is heterarchically, not hierarchically, organized. Luria's dynamic understanding of neurology and neuropsychology are in fact a model exemplification of how investigations of movement can be anchored in what many dynamic systems theorists term "real-time" phenomena (van Gelder and Port 1995, Thelen and Smith 1994) rather than exclusively in studies of *the brain*, in the kinetic artificialities of movement laboratories, or in computer modeling.

A more critical commonality is notable as well, however. Neither Luria nor dynamic system theorists recognize the fact that movement creates its own distinctive temporal-spatial-energetic qualities, and that this formative process results in the creation of a distinctive dynamics - precisely as "kinetic melody" and "dynamic pattern" so aptly suggest but do not specify. The dynamics are not only behaviorally observable; they are internal to the self-moving body creating them and thereby potentially the basis of kinesthetic memory. In effect, through self-movement, there is always potentially a form to remember, a form not of sensations as such, but of a movement dynamic.

Kinesthetic Memory

Animation is of the nature of life. Being animate beings, we move, and in moving articulate a kinetic dynamics. We do so as adults in virtue of kinesthetic memory, and, to begin with, in virtue of our having learned our bodies and learned to

move ourselves (Sheets-Johnstone 1999). Because dynamic patterns of movement have distinctive spatial, temporal, and energetic qualities,¹ they each have a distinctive spatio-temporal-energetic form that is potentially invariant, depending upon whether we practice the pattern, and through repetition, learn it. Kinetic dynamics are thus of the essence of kinesthetic memory in precisely the way they are of the essence of kinetic melodies. Melody and memory are indeed dynamic images of one another - as Luria indicates when he identifies kinetic melodies as “*integral kinaesthetic structures.*” In effect, being dynamically patterned, kinesthetic memories are not vague, abstract kinetic phantoms but are inscribed in the body as specific bodily dynamics, dynamics that, as enacted, are at once familiar and tailored distinctively to the particular situation at hand. Familiarity and distinctive tailoring were briefly exemplified earlier in examples of speaking, hammering, and weaving one’s way along a crowded sidewalk. A more detailed example will bring finer dimensions of both aspects to light.

Writing one’s name is commonly thought of as an act rather than as a coordinated series of movements. Yet a coordinated series of movements defines more accurately “the act” of writing one’s name. More specifically still, to write one’s name is to move through a dynamic series of coordinated movements that is kinesthetically felt *both* as dynamic and as dynamically familiar. What makes the series familiar are invariant dynamic features common to all instances of writing one’s name: greater and lesser moments of force occur at certain moments in the flow, moments where one accentuates a letter or part of a letter, for example; changes in direction take place smoothly or abruptly at certain places, and in a jagged or rounded manner; pauses occur at certain moments in the writing, perhaps with a felt sense of suspension as when one dots an *i* or crosses a *t*; the beginning of the signature and its end are clearly marked in some way. In short, in the writing of one’s name, a distinctive spatio-temporal-energetic dynamic plays itself out, and with it, a certain dynamic is experienced that is both familiar and unique. The uniqueness of the dynamics is first and foremost a kinesthetic uniqueness, not a visual uniqueness. Indeed, it is fundamentally the kinetic and kinesthetically-felt dynamics that make the signature visually unique and familiar.

At the same time, however, one’s signature is tailored to present particularities: the writing implement one is using, for example, the surface on which one is writing, and the importance of the signature are variables capable of generating variations on a theme, as when, for example, one is writing one’s name on a blackboard, or writing with a pen that is running dry, or signing

¹ The qualities of movement - tensional, linear, amplitudinal, and projectional - are analyzed in detail in Sheets-Johnstone 1980 [1966]. The qualitative nature of movement is discussed in detail in Sheets-Johnstone 1999.

a document such as a marriage license or a will. The dynamics of writing one's name - the ease, rhythm, size of one's movements, and so on - vary in proportion to the particularities of the immediate situation. A basically invariant and familiar dynamics adjusts itself to the situation at hand.

One can readily see how the dynamic series of coordinated movements unfolds as a kinetic melody: *once initiated*, the movement flows on by itself. Assuming one has learned to write one's name, and barring pathological disturbances, one does not need to oversee the drawing of each letter, for example, as one did when learning to write; one does not get lost somewhere in the process, as one might if suffering from a brain lesion. A coordinated series of movements whose dynamics are engrained in kinesthetic memory is run off and recognized kinesthetically. As it runs off, it is unified by retentions and protentions (Husserl 1964) until the series and its familiar and unique dynamics come to an end. When Luria speaks of the *automatization* of movement, it is important to point out that he is describing the way in which a single impulse is sufficient to activate a kinetic melody, and not asserting that one is unaware of writing one's name, that one is unconscious of doing so, or that one can nod off while the process continues by itself. Furthermore, it is not merely that beginning a kinetic melody is sufficient to generate its entire performance; it is that the movement that flows forth effortlessly in a coherent dynamic does so because we know and remember the flow in a corporeally felt sense: *we kinetically instantiate what we know kinesthetically*. What is automatic is, in effect, kinesthetic memory. The melody runs off by itself because a familiar dynamics is awakened in kinesthetic memory and generated by it.

The point warrants further clarification, notably because the initial impulse is significant beyond the fact that it generates a dynamics on the basis of kinesthetic memory. The initial impulse is volitional. Unless we suffer from dementia or some similar malady, we do not find ourselves out of the blue brushing our teeth, for example, or walking on a street ten blocks from home. We initiate brushing and walking. We initiate them by initiating a certain kinetic dynamics that includes a certain bodily orientation, a certain environmental setting, a certain interaction with certain implements or items - a toothbrush or shoes, for example - and so on. Similarly, we do not suddenly find ourselves *not* brushing our teeth anymore but eating breakfast, or *not* walking anymore but sitting on a park bench. We are kinesthetically aware of a certain kinetic dynamics coming to an end. In short, our tactile-kinesthetic body is always present, and present along a gamut of possible awarenesses from marginal to maximal. Any time we wish to pay *closer* attention to it, there it is.

The relationship between voluntary action and kinesthesia has important implications with regard to attention, familiarity, and something "going wrong." The relationship is put in ironically sharp relief in a commonly used textbook,

Scientific Bases of Human Movement. In a chapter titled “The Proprioceptors and Their Associated Reflexes,” Gowitzke and Milner (1988, p. 193) write that “The voluntary contribution to movement is almost entirely limited to initiation, regulation of speed, force, range, and direction, and termination of the movement.” Kinesthetic “limitations” are in fact sizable freedoms, precisely as Bernstein originally demonstrated by way of *degrees of freedom* in his studies of human movement and as any attempt by any normal person to duplicate a movement sequence with pinpoint exactitude readily indicates. Initiation, termination, speed, force, range, and direction of movement may indeed be “regulated,” the last four “limitations” in particular specifying in an abbreviated and incomplete way spatio-temporal-energetic qualities of movement, qualities that we can voluntarily change in myriad ways and in so doing, change the dynamics of any movement we perform. We can, for example, change resolute movements into hesitant ones by making certain changes in the force, range, and speed of our movement. We might thereby radically alter the way in which we customarily write our name, brush our teeth, or walk - and thereby nullify a familiar dynamic.

Turning attention to our own movement in continuation of an initial volitional impulse, we attend to a kinetic melody in progress: as noted, any time we care to pay closer attention to our tactile-kinesthetic body, there it is. Turning attention elsewhere but continuing on with the melody, we marginalize tactile-kinesthetic sensitivities but are not totally unaware of ourselves in the process of moving. Thus, to say that we are aware of ourselves moving only when something goes wrong is misguided. Noticing that something is wrong necessarily assumes the familiar dynamic feel of that same or similar something going right. Indeed, we can be aware that something goes wrong only if we already know what commonly goes right. To insist otherwise is illogical.

Now to acknowledge that we can be aware that something is amiss only if we already know a familiar kinetic dynamics is to acknowledge that we can be aware of something going wrong only on the grounds of kinesthetic memory. *Kinesthetic memory is the foundation of familiar kinetic dynamics*. It is thus not without reason that Luria at one point speaks of “*kinaesthetic melodies*” (Luria 1973, p. 253; italics added). Kinesthetic memory is structured along the lines of “*kinaesthetic melodies*,” and *familiar* “*kinaesthetic melodies*” are inscribed in kinesthetic memory.

The Term “Motor”

Motor skills are not properly “motor” phenomena, and indeed, the term “motor” is wayward. The skills are kinetic, and they are learned through sensory-kinetic experience. Moreover complex concepts are generated in the course of sensory-

kinetic learnings, concepts having to do with the dynamics created by self-movement, i.e., with spatio-temporal-energetic qualities of movement.² “Motor” skills do not generate such concepts because no sentient moving person is present who is moving skillfully or learning to move skillfully: the erstwhile sentient moving person has been reduced to an operative motor.

The above broad criticisms of a “motor” vocabulary to describe organic movement need tempering in recognition of researchers not misled by the term, researchers who, being implicitly or explicitly aware of how a purely motor vocabulary effaces living subjects, justly take a sentient moving person into account.³ Luria, for example, does not compromise the reality of sentient moving persons in his neurological investigations of “motor” tasks and “motor programmes” (Luria 1973). His non-mechanization of self-movement stems from his dual conception of science, a conception neuropsychologist Oliver Sacks eloquently eulogizes in his foreword to Luria’s *The Man with a Shattered World* and a conception Luria himself eloquently puts forth in *The Making of Mind*. In essence, Luria distinguishes between classical and romantic science, the former being geared to a reductionist perspective, computer simulations, “mathematical schemas,” and the like (Luria 1979, p. 176); the latter being geared to observation and description - “phenomenological description” (ibid., p. 177) - that is neither “superficial” nor “incomplete” (ibid.), but that traces out relationships among things and events in such a way that multiple perspectives are gained and “we come to the essence of the object, to an understanding of its qualities and the rules of its existence” (ibid., p. 178). Given Luria’s equal esteem for both sciences, it is not surprising that kinetic/kinesthetic melodies figure centrally in his neurological investigations: they are vital to a veridical account of neurological normalities and pathologies. His combined classical and romantic neuroscience contrasts markedly with the austere landscape of today’s cognitive neuroscience where kinetic/kinesthetic melodies figure as alien, flimsy bodies lacking sturdy credentials.

Unlike analyses of “motor behavior”, analyses of kinetic/kinesthetic melodies open the way to commonly overlooked aspects of movement, in part, just those “limited” aspects of movement designated “voluntary.” In opening toward these foundational aspects of self-movement, analyses of kinetic melodies readily defuse typically mechanical concepts underpinning motor analyses in the same way that they defuse typically mechanical understandings of automatization. This is

² What the textbook names as voluntary aspects of movement - “speed, force, range, and direction” - are created qualities of self-movement; measurements of these aspects constitute third- person assessments.

³ As Merleau-Ponty might say, they do not simply “manipulate things and give up living in them” (Merleau-Ponty 1964, p. 159).

because kinetic/kinesthetic melodies are descriptive of the dynamic phenomena themselves, not a mechanical reduction of them. More concretely, they pinpoint the nature of self-movement in a living sense; they *language kinetic experience*.⁴ The term *motor* is no match for this experientially-descriptive language. The term, after all, names a mechanical device, a man-made machine, and is not a term whose genesis lies in observations of living organisms. Darwin, whose round-the-world observations of life would authorize use of the term were it accurate, does not use it. In fact, the term has no evolutionary foundations. It is not difficult to appreciate why: “motor” does not describe the dynamics of living bodies but specifies something inside, something hidden from view, a “driving force” that gets the larger object in which it inheres moving in some way, *its* movement providing energies for the object to move or to do work. We can thus appreciate why neither dynamics nor volition are of topical, not to say strategic, “motor” concern: a real-life kinetics and kinesthesia are nowhere to be found. Kelso documents this lack from a dynamic systems perspective when, in writing of “traditional approaches” to motor learning, he concludes that “The organism, to put it bluntly, is treated like a machine whose task is to associate inputs and outputs” (Kelso 1995, p. 160).⁵

In sum, to continue to refer to sentient moving bodies in terms of motor behavior, motor memory, and so on, without balancing the ledger to include dynamic and voluntary aspects of movement, is to continue to think of animate forms as mechanical things that are capable neither of generating kinetic melodies nor of voluntarily initiating movement or of voluntarily shaping it by changing its dynamics. The point is of critical importance not only in light of the manner in which movement is commonly studied in today’s scientific world but in light

⁴ For more on the concept and challenge of *linguaging experience*, see Sheets-Johnstone 1999, 2002.

⁵ The opening statement of a review of a recent neuroscience book on “motor learning” testifies to the preoccupation with something “inside”: “Motor learning can be defined as a set of neural processes associated with practice that lead to changes in performance and capabilities” (Flash 2001, p. 1612). The book - *The Acquisition of Motor Behavior in Vertebrates* - is amply instructive in this regard: brain structures and neural networks are the focal concerns; eye-blink conditioning is a major topic (e.g., „Eyeblink conditioning is recognized as a form of motor learning” [Hallett, Pascual-Leone, and Topka 1995, p. 291]); ablation studies constitute a major form of investigation; verbal communication, communication that obviously requires sequential articulatory movement is not recognized as “procedural” knowledge - knowledge that “refers to sequential behavior and usually relates to motor performance” - but is unwittingly categorized as “declarative” knowledge - knowledge that “refers to facts and includes all information about which we think and that we communicate verbally” (ibid., p. 289). Knowledge about “sequential tasks” lags behind knowledge about conditioned response. In fact, knowledge about living movement - kinetic melodies - is far in arrears of knowledge about laboratory-induced movement.

of the manner in which uncritical usage skews understandings to the point that kinetic melodies are occluded even as they appear to be recognized. Merleau-Ponty's "motor intentionality" is a classic instance. It warrants extended discussion because it furnishes insights into veridical understandings of movement, kinesthetic memory, and habit.

Merleau-Ponty's "Motor Intentionality"

Merleau-Ponty's motor intentionality verges on Luria's kinetic melodies not only in offering an explanation of pathological disturbances, but in emphasizing the importance of the first instant of a movement: "being the active initiative, [the first movement] institutes the link between a here and a yonder, a now and a future which the remainder of the instants will merely develop" (Merleau-Ponty 1962, p. 140). Because Merleau-Ponty does not examine *the experience* of movement, however, he never arrives at its dynamic kinetic structure. Moreover because he does not recognize kinesthetic experience, he does not recognize kinesthetic memory and the kinetically/kinesthetically forged sense of familiarity that is the basis of habit. He appears to believe that to recognize kinesthetic experience is to fall into the empiricists' trap of "a mosaic of 'extensive sensations'" (ibid., p. 143n) and that the truth of movement lies rather in the fact that the body "is a system which is open on to the world, and correlative with it" (ibid.). In brief, he appears to believe that to admit kinesthetic experience into his account would tether him to a subject in exclusion of a world. In effect, though he speaks specifically of "a kinetic melody" (ibid., p. 134), of the "melodic character" of a gesture (ibid., p. 105), of how a patient's movements have lost their "melodic flow" (ibid., p. 116), and of how the same patient fails to grasp a story "as a melodic whole" (ibid., p. 132), the experiential nature and history of the melody, and its dynamic character elude him. What structures kinetic melodies is in the end "ambiguated"⁶ rather than phenomenologically analyzed. The 'motor' of "motor intentionality" is, in other words, hidden from view, as in classical science, located in "autonomous" and "anonymous" "functions" (ibid., e.g., pp. 84, 86, 160) or equivalently, inheres in a "prepersonal *I* who provides the basis for the phenomenon of movement" (ibid., p. 276, note 1). There is neither a tactile-kinesthetic body nor kinesthetic memory in these functions or prepersonal *I*, nor a kinetic history, a history not only of learning the kinetic melody of a new

⁶ Johnstone (2002) uses the term "disambiguator" to designate a notational device that distinguishes two different meanings of an otherwise ambiguous sentence. I am borrowing and converting his term.

movement sequence, but of learning one's body and learning to move oneself to begin with (Sheets-Johnstone 1999), self-directed learnings that each and every human initiates and carries out from birth. The essential familiarity of habit - its kinetic dynamics - has in turn no experiential foundations.

Yet *habit* is of central moment to Merleau-Ponty's "motor intentionality." Because "a movement is learned when the body has understood it" (1962, p. 139)⁷ and because it is the understanding, competent body and not the learning or practicing body that defines Merleau-Ponty's "motor intentionality," motor intentionality is easily conceived to be fundamentally the work of a "habit body," *a body that already knows*. Indeed, it becomes ironically clear how and why a habit body holds a privileged position in Merleau-Ponty's account of movement. A habit body already knows how to move, and its movement is already all of a piece: a habit body is both already "expressive" and a readily "expressive" storehouse of "kinetic melodies" (ibid., p. 146). Accordingly, there is no need to dwell on *just how the body comes to be a habit body or what kinesthetically structures its understandings*. In a "prepersonal" kinestheticless world, habit has no experiential precursors and no need of such. The body "which is open on to the world and correlative with it" is a ready-made. Thus, when Merleau-Ponty defines habit as "knowledge in the hands, which is forthcoming... when bodily effort is made" (ibid., p. 144), he passes over a tactilely and kinesthetically resonant body that is the source of knowledge "in the hands," a body that has *learned* its way in the world from the beginning by moving, gaining knowledge "in the hands" and elsewhere in the process. He thereby misses *the familiar kinetic dynamics that fundamentally constitutes habit*, in this instance, the habit that is there in person "in the hands." Moreover although he points out with respect to movement of one's body that "[t]he synthesis of both time and space is a task that always has to be performed afresh," thus indicating that the habit body is flexible, adjusting itself to the kinetic demands of the moment, the task "that always has to be performed afresh" never makes an appeal to kinetic knowledge or to kinesthetic memory. On the contrary, Merleau-Ponty affirms that "Our bodily experience of movement is not a particular case of knowledge [but] provides us with a way of access to the world and the object, with a 'praktognosia'" (ibid., p. 140). Clearly, the very stuff of habits - their foundational kinesthetic familiarity, a familiarity renewed by way of kinesthetic memory each time they are reactivated - is nowhere recognized.

⁷ Cf. Bergson, who, speaking specifically of how repetition "teaches" the body in the course of learning a new coordination, writes, "A movement is learned when the body has been made to understand it" (Bergson [1896] 1990, p. 112).

Merleau-Ponty's *habit body* is not only without kinesthesia but is also preeminently an adult body without a history, a body that thereby rings false neurologically as well as existentially. In both a neurological and existential sense, kinesthesia and kinesthetic memory are essential to progressive developmental achievements and capacities, and to the formation of habits on the basis of those achievements and capacities. Adultist views of oneself in the world, perhaps particularly ontologically-oriented "phenomenological" views,^{8 9} ignore the complex nature of infancy and its intricate developmental history, a history without which one could not attain adult habits, let alone adultist views of oneself in the world. While Merleau-Ponty's "motor intentionality" and habit body rightly prominence the body, they ignore a previous and ongoing lifetime of kinesthetic learning and memory at the same time that they presuppose it at every step.

In sum, so strong is the driving thematic of an indissoluble body-world relationship that it overrules an investigation of movement and in consequence effectively squelches a phenomenological account of self-movement, i.e., of kinesthetic experience. While it is true that Merleau-Ponty avoids the representations of the intellectuals and the "extensive sensations" of the empiricists by tying subject and object - body and world - together through a "motor intentionality" that "cease[s] to draw a distinction between the body as a mechanism in itself and consciousness as being for itself" (*ibid.*, p. 139), the move is not without hazard. Kinetic melodies demand kinetic explanations. Merleau-Ponty can speak of "melodic flows" devoid of kinesthesia and kinesthetic memory only by explaining the body's ready access to the world as "autonomous" and "anonymous" functions of a prepersonal *I*, in essence, as "motor" functions defined by classical science. But he also specifies another "motor" phenomenon, one that appears to be a subrogate for kinesthesia, namely, the body image (*schema corporel*).⁹

Body Image

Merleau-Ponty is not the only person to invoke a body image to explain corporeal-kinetic phenomena, but his writings on the subject are a good place to begin since he takes up the term from its original coinage in neurology, and since his "existential analysis" (*ibid.*, p. 136) of it readily demonstrates how kinesthesia and kinesthetic memory may be trivialized or passed over altogether. He begins by considering the original definition of body image - in his words, "a *compendium* of our bodily experience" (*ibid.*, p. 98) - and goes on to improve

⁸ One could cite Heidegger as well.

⁹ See Gallagher (1986, 1995) for discussions of the confusion of body image and body schema.

on it, defining body image rather as “a total awareness of my posture in the intersensory world” (ibid., p. 100). But he improves on this definition too, enlarging it, citing the fact that “Psychologists often say that the body image is *dynamic*” (ibid.). He makes “total postural awareness” *dynamic* by making it a bodily “attitude” rather than a bodily “form”: “Brought down to a precise sense, this term means that my body appears to me as an attitude directed towards a certain existing or possible task” (ibid.). He discusses this bodily attitude essentially in terms of space, specifically, “a *spatiality of situation*” (ibid.). One looks in vain, however, in the examples he subsequently gives and in the discussions that follow, of a veritable *dynamic*, “the situation of the body in face of its tasks” (ibid.) nowhere spells out a *dynamic* beyond the fact that the body moves in face of its tasks.

Merleau-Ponty’s re-definition of the body image as “a spatiality of situation” coincides with the self-description of the patient whose case study constitutes the basis for his reformulation of the term. The patient - Schneider - is capable of kinetic melodies only in concrete situations, where specific objects calling for specific movements are present - for example, scissors, leather, needle, and thread - and not in abstract situations where he is requested to perform certain movements - for example, pointing to a part of his body. Of the former movements, Schneider states that “I experience the movements as being a result of the situation, of the sequence of events themselves; myself and my movements are, so to speak, merely a link in the whole process and I am scarcely aware of any voluntary initiative... It all happens independently of me” (ibid., p. 105). The statement is a conceptual blueprint, as it were, of the “third term” - *existence* - that Merleau-Ponty wishes to instantiate between the rationalists’ representations - “the psychic” - and the empiricists’ sensations - “the physiological” (ibid., p. 122n). With respect to kinesthesia and kinesthetic memory, the self-description is crucially telling: movement is simply “a result of the situation”; and the moving subject is “scarcely aware of any voluntary initiative.” It is no wonder, then, that in Merleau-Ponty’s correlative autonomous, anonymous, prepersonal body-world nexus, kinesthesia and kinesthetic memory are replaced by a body image whose dynamics consist simply in the fact that the body moves.¹⁰ Being a power that projects the body into the world, the body image creates an “‘intentional arc’” (ibid., p. 136) that existentially links it to the world. In the patient’s case, the arc is truncated and otherwise damaged. To paraphrase Merleau-Ponty, the arc no longer “projects round about Schneider his past, his future, his human setting,

¹⁰ Ostensibly, Merleau-Ponty has reduced normal, everyday movement to its most elementary level, but that level in fact fails to account for the dynamics of movement — the basis of habit - and the ontogenetical realities of infant life.

his physical, ideological, and moral situation; it no longer brings about the unity of his senses, of intelligence, of sensibility and motility” (ibid.).

Body image and intentional arcs notwithstanding, Merleau-Ponty remarks pointedly on the extraordinary way in which Schneider uses movement to get his bearings with respect to a task he is asked to do or to an object he is asked to recognize. “If a part of his body is touched and he is asked to locate the point of contact, he first of all sets his whole body in motion and thus narrows down the problem of location, then he comes still nearer by moving the limb in question” (ibid., p. 107); “If the subject’s arm is extended horizontally, he cannot describe its position until he has performed a set of pendular movements which convey to him the arm position in relation to the trunk” (ibid.); “The patient himself neither seeks nor finds his movement, but moves his body about until the movement comes” (ibid., p. 110). Later, as if in summation of these facts, Merleau-Ponty comments that “concrete movements, which are preserved by the patient as are those imitative movements, whereby he compensates for his paucity of visual data, arise from kinaesthetic or tactile sense, *which incidentally was remarkably exploited by Schneider*” (ibid., p. 113, italics added). In short, it is through moving, through “active movements” (ibid., p. 107), that Schneider tries to find his way, follow an order, respond to a request, and so on. Merleau-Ponty thus appears to recognize kinesthesia, but only in the pathological instance when no kinetic melody is forthcoming, or more generally, “only when something goes wrong.” Kinesthesia might thus seem to be something like the proverbial tree falling in the forest: unless we sense it, it does not exist. Indeed, Merleau-Ponty’s solution is to relegate “consciousness of movement” to an amorphous *background*.

[F]or the normal person every movement is, indissolubly, movement and consciousness of movement. This can be expressed by saying that for the normal person every movement has a *background*.... The background to the movement is not a representation associated or linked externally with the movement itself, but is immanent in the movement inspiring and sustaining it at every moment (ibid., p. 110).

The term “background” is both an expeditious and ambiguous way of reckoning with “consciousness of movement”: it effectively nullifies kinesthetic experience and kinesthetic memory, and thereby makes “consciousness of movement” literally, logically, and experientially unintelligible. By invoking a “background,” Merleau-Ponty recognizes what must be recognized - “consciousness of movement” - but cuts short its actual experience, nature, and significance. Certainly we are not ordinarily attentive kinesthetically in a *focal* way when brushing our teeth or weaving our way quickly through a crowd; we are concentrated on the task at hand. Our kinesthetic awareness of ourselves *is* in the “background.” But being in the background does not mean that it is completely

outside awareness. It is not only that any time we care to pay *focal* attention to our “consciousness of movement,” there it is, but that *the familiarity of our movement in the form of a certain kinetic dynamics undergirds our brushing, weaving, and so on, and is marginally or pre-reflectively in our awareness even as we focally attend to the appointment to which we are rushing as we weave or to what we will have for breakfast as we brush*. A kinetic dynamics is sensuously present at the lower end of the continuum that describes the intensity - or focal to marginal - gradient of consciousness. Indeed, if as Merleau-Ponty writes, the background “is immanent in the movement inspiring and sustaining it at every moment,” then a certain kinetic dynamics is undeniably underway that is familiar as well as self-propelling, a dynamics that is not there only if we notice it *focally*, but a dynamic that is present as a familiar, ongoing, and particular kinesthetic melody. How otherwise might one legitimately speak of a “consciousness of movement”?

In sum, a veritable kinetic dynamics is not reducible to a “[bodily] attitude directed towards a certain existing or possible task.” Merleau-Ponty’s reformulated body image falls short of fulfilling its dynamic promise. A veritable kinetic dynamics is kinesthetically felt, which is to say it is experienced in the flow of movement itself, and with a sense of familiarity (supposing the movement is not novel) generated through kinesthetic memory.

Body Image and Body Schema

The term body image is actually misleading since it conjures up not only something preeminently *visual*, but something not actually perceived, i.e., something *imaginary*. Philosopher Shaun Gallagher and neurophysiologist Jonathan Cole try to correct these false impressions by specifying body image in exacting terms and by distinguishing it from body schema (see also Gallagher 1986, 1995). In their joint article on a “deafferented subject” - a man who lost virtually all kinesthetic awareness - they attempt to document just what is missing in the way of a body image and body schema, and how the subject - referred to as IW - compensates for the loss and learns to move anew. In the process, and unlike Merleau-Ponty, Gallagher and Cole do not trivialize or pass over kinesthesia. On the contrary, using the broader term “proprioception,” they specify both a neurological informational system and a system of experiential awareness. They thereby distinguish body image from body schema: body image is “a complex set of intentional states” that includes perceptual experience, conceptual understandings, and emotional attitudes; body schema is “a system of motor capacities, abilities, and habits that enable movement and the maintenance of posture,” a system that operates “preconsciously” and “subperso-

nally” (Gallagher and Cole 1998, p. 132). They implicitly vindicate Luria’s neurological diagnostic and his emphasis on the quintessential significance of kinesthetic afferents to intention or “will” when they state, “At the earliest stage of his illness IW had no control over his movements and was unable to put intention into action. There was, one might say, a disconnection of will from the specifics of movement” (ibid., p. 135). The implicit vindication, however, is short-lived: neither body schema nor body image approximate to the neurological and experiential dynamics of a kinetic melody.

To begin with, a body schema has no basis in experience. It is at best an explanatory convenience, a hypothetical entity in the brain (or central nervous system as a whole) that is conjured to do the work of putting movement together, furnishing a kinetic blueprint for neurological eyes only, as it were. In contrast, a kinetic melody describes both what is constructed neurologically in the course of learning - a distinctive temporal course of innervations and denervations, as in learning to walk, to brush one’s teeth, to make an abdominal incision, to do the tarantella - and what is experienced - a distinctive dynamic flow of movement. A kinetic melody is not a *thing* in the brain (or in the central nervous system) but a particular neurological and experiential dynamic. Each melody is in fact a *neuromuscular dynamic* whose innervations and denervations, together with the constantly changing muscle tone they generate, constitute a particular temporal organization. Kinetic melodies thus straddle two worlds; unlike a body schema, they describe inherently dynamic patterns that are at once neurological and experiential.

A body image suffers from the same lack of experiential grounding and dynamic resonance as a body schema. The identification of “the perception of movement” with body image (Gallagher and Cole 1998, p. 134) not uncommonly reduces to a *positional* awareness of the body - e.g., “I can tell you where my legs are even with my eyes closed”; “Proprioceptive awareness is a felt experience of bodily position that helps to constitute the perceptual aspect of the body image” (ibid., p. 137). While the perception of movement certainly includes positional awarenesses, it is quintessentially a *dynamic* awareness, and to overlook the kinetic/kinesthetic dynamics that are its source is to distort the account of “the perception of movement.”

The problem with the body image might be judged to be basically a methodological problem: beginning with a construct instead of experience. Unless one begins with and hews to experience, the very thing one wants to explain eludes one, in this instance, the experience of an unfolding dynamics, the perception of one’s own body in motion. The first question is properly not “How is such an experience possible?,” but “What is the nature of kinetic experience?” In turn, the first task is not to come up with an explanatory entity

but with a descriptive account of the phenomenon in question." Methodology is thus of critical importance. Turning toward "the thing itself" - *self-movement* - one realizes that a body image is not up to the task set for it. The phenomenology of self-movement cannot be deduced from pathology. Certainly one may infer the normal from the pathological, but inference is not phenomenology.

The importance of hewing to experience may be highlighted by noting a correspondence between Schneider and IW: IW too "exploits" movement to trigger movement. He exploits it not by actively initiating movement as Schneider does, but through his ready ideational access to earlier experiences of normal movement. IW already knows fundamental kinetic melodies; he knows "how they go," so to speak, and even how they are supposed to go. Thus, when Gallagher and Cole write that "IW's success in recovering useful movement function has depended primarily on his finite mental concentration, and to a much lessor (sic) degree on reaccessing or relearning motor programs which are, so far, poorly understood" (*ibid.*, p. 138), they neglect to consider that IW knows the movement he intends or "wills": he has a kinetic memory of what it is to reach, to grasp, to sit, to stand. He knows these movements in his bones, even though he can no longer move these bones except by visual initiation and monitoring. Thus, although he cannot call forth kinetic melodies from kinesthetic memory, he can structure his present visually guided movement on the basis of his kinetic knowledge of them. In fact, short of this dynamic memory of movement, he would not even know how to begin moving. To appreciate this, one need only consider what it would be like *to be born* as a "deafferented subject." IW's visual re-creation of movement does not begin from scratch but from a previous body of knowledge of such mundane kinetic melodies as walking, buttoning, and picking up an egg.

In sum, kinetic melodies describe the reality of movement in neurological and experiential ways that neither body schema nor body image can approximate. They do so because they explicitly recognize a bodily-kinetic dynamic. More explicitly still, they recognize a vast range of bodily-kinetic dynamics "in face of the world," each melody being distinctly analyzable as a dynamic pattern of movement. Body image and body schema are no match for this bodily-kinetic dynamic. Indeed, they are recalcitrant to Gallagher and Cole's noble clarifying efforts and should be jettisoned in favor of a veridical phenomenology of selfmovement, one that recognizes the foundationally dynamic character of movement from the start.

" One might cite neurophysiologist Kurt Goldstein (1939) as well as Husserl: "[I]t is the first task of biology to *describe carefully all living beings as they actually are*" (p. 6); "*What do the phenomena... teach us about the «essence» (the intrinsic nature) of an organism?*" (p. 7).

The Pointillist Conception of Movement: Its Conceptual Underpinnings and Liabilities

Motion, Descartes stated, “[is] the transfer of one piece of matter, or one body, from the vicinity of the other bodies which are in immediate contact with it, and which are regarded as being at rest, to the vicinity of other bodies” (Descartes [1644] 1985, p. 233). With respect to a body in face of its task - sitting down, lifting a suitcase, cutting a swath of grass - point A and point B are typically the points of interest. They mark the place of departure and arrival of a moving body, and thereby the beginning and end of its task. The points say nothing of the dynamics of movement. They describe a basically static spatial world intermittently interrupted by bodies changing position.

The spatial concordance of body and world described by Merleau-Ponty is rooted in a pointillist conception of movement: individuals move from point A to point B, following along the lines of an intentional arc. In privileging *position*, the conception neglects to account for and virtually effaces movement itself. The neglect and virtual effacement are straightaway evident in Merleau-Ponty’s concluding analysis of Schneider: “[T]he normal subject has his body not only as a system of present positions, but besides, and thereby, as an open system of an infinite number of equivalent positions directed to other ends. What we have called the body image is precisely this system of equivalents, this immediately given invariant whereby the different motor tasks are instantaneously transferable.” (Merleau-Ponty 1962, p. 141).¹² Movement - what putatively should make the body image *dynamic* - is nowhere in evidence because in fact there are no dynamics, only a pointillist conception of “motricite.”

The pointillist conception is similarly exemplified in the earlier quotations from Gallagher and Cole: knowing where one’s legs are when one’s eyes are closed, for example. The conception clearly leads one erroneously to believe that movement is simply a change of position, and in turn to conceive a kinesthetic awareness of movement to be an awareness of changed positions. The conception is actually spatially deficient in its non-recognition of the spatial qualities of

¹² The temporality of movement is of notable significance in this context. As Luria points out, voluntary movement demands not only kinesthetic afference but an ever-changing series of innervations and denervations. What he terms the “dynamic stereotype” is habit, a basically invariant but still kinetically variable phenomenon: “*the invariant motor task is fulfilled not by a constant, fixed set, but by a varying set of movements which, however, lead to the constant, invariant effect.*” (1973, p. 248). Transferability is thus grounded not in a body image but in dynamic sedimentations constituting a familiar dynamics anchored in kinesthetic memory.

movement and correlative kinesthetic awarenesses. Indeed, however persuasive the notion of “a spatiality of situation” - “knowing] indubitably where my pipe is” (Merleau-Ponty 1962, p. 100) - its explanatory referents - body image and body schema - effectively suppress the essential insight that *movement creates its own space, time, and force, and thereby the dynamics that are movement itself*. If movement did not create its own space, time, and force, there would be no such thing as habit: no specific kinetic dynamic would exist to repeat, to practice, to learn. Equally, there would be nothing to remember, hence, no kinesthetic memory.

The pointillist conception of movement that body schema and body image implicitly support emanates from a bias of Western thought that anchors reality in the spatiality of things to the exclusion of their temporality, i.e., their impermanence, their flow, their temporal dynamics. A Western predilection for mechanics over dynamics, for mass - *things* - over flow - *dynamics* (e.g., Yates 1987, Kelso 1995) - testifies to this bias. Traditional views of motor behavior, motor memory, motor control, motor habits, and so on, exemplify a further dimension of the bias in their Cartesian reduction of movement to objects in motion, quantifiable *things* tied to positions in space and moments in time, and either by nature not kinesthetically attuned or by manner of study not recognized as being kinesthetically attuned. Not only is it easier to explain conditioned eye-blinking (see note 5) by way of objects in motion than to describe dynamic processes like piano-playing by way of kinesthesia and kinesthetic memory, but it is less perilous ontologically: like mechanisms, objects in motion are spatially-localized, stable entities that anchor functions. Correlatively, distinct units in the brain dedicated to short-term storage and long-term storage, and opposing species of memory - e.g., fact, declarative, and representational as against skill, procedural, and dispositional, respectively (Goethals and Soloman 1989, p. 5]) - specify solid, well-defined memory repositories and categories as the kinetic dynamics of kinesthetic memory do not. Clearly, a motorized mechanics-over-dynamics goes hand in hand with a conception of movement that eschews the temporal in favor of the spatial.

Being temporal by nature, kinesthetic memories, like kinetic melodies, subsume not only rhythmicities within their compass, but temporally unfolding postural and orientational relations, kinetic pretensions and retentions, and so on. Kinesthetic memory is thus not a pointillist system of remembered *sensations*, but a remembered spatio-temporal-energetic dynamics. Indeed, kinesthetic memory is not memory of sensations of one's body, but of perceptions of the dynamics of self-movement. The point warrants elaboration.

Kinetic melodies are subtended by kinetic harmonies. Everyday movement involves the whole body; coordinated movement is the result of global kinetic orchestrations. Kinetic melodies are thus grounded in a *kinetic harmonics* that is

the whole moving body. In turn, the experience of movement is not a matter of localized and discrete bodily sensations, but of a felt harmonious whole where particular areas may be tonally dominant, as when one kicks a ball, moves a fork to one's mouth, or stands up. Discrete, localized bodily sensations - sensations *as such* - are not dynamic awareneses but preeminently positional ones like itchings and ticklings. Neurophysiologists Jonathan Cole and Jacques Paillard's (1995, p. 256) perspicuous but kinetically unelaborated distinction between "topokinetic" movement (e.g., pointing to a place on the body where one was touched) and "morphokinetic" movement (e.g., drawing figure eights in the air in front of one) adumbrates the difference between positional and dynamic awareneses of movement. To be topokinetically attuned - to attend to or remember positional sensations *as such* - is to reduce movement to an object in motion in the manner of Descartes and thereby forego the sense of a dynamic kinetic harmonics. (It is significant that Cole and Paillard describe the *gestural language* of deafferented subjects as a "morphokinetic melody," while otherwise explaining the subjects' movement in terms of body image and body schema [ibid., p. 259].) The kinesthetic memory of walking - *not a visual image but a morphokinetic recollection* - subsumes a kinetic harmonics; the memory is not a memory of positions but of a whole body dynamic, which is based not on bodily sensations - localized, positional happenings - but on the perception of movement. In short, kinesthetic memories are constituted through and through by dynamic, not sensational, sedimentations. There is in fact no position that the body is *in* walking.¹³

The liabilities of a pointillist conception of movement point toward a challenging methodological question: what justifies starting with pathology, i.e., the loss of kinetic melodies? If the purpose is to understand everyday self-movement, why not start with a magnification of such movement rather than with its diminishment? Why, for example, not begin with dance, and ask whether motor theories, body schemas, and body images are up to the task of explaining how such intricate and complicated ongoing movement is learned and remembered. Merleau-Ponty spoke of dancing as a "motor habit" and said that "forming the habit of dancing is discovering, by analysis, the formula of the movement in question" (Merleau-Ponty 1962, pp. 146, 142, respectively). Of his dance "Untitled Solo," Merce Cunningham wrote,

A large gamut of movements, separate for each of the three dances, was devised, movements for the arms, the legs, the head and the torso which were separate and essentially tensile in character, and off the normal or tranquil body-balance. The

¹³ - any more than there is a position that the wind is *in* in blowing, or that a wave is *in* in rolling forward.

separate movements were arranged in continuity by random means, allowing for the superimposition (addition) of one or more, each having its own rhythm and time-length. But each succeeded in becoming continuous if I could wear it long enough, like a suit of clothes (Cunningham: undated, unpaginated).

Untitled Solo is hardly a motor habit and learning it was hardly learning “by analysis, the formula of the movement.” Through practice, the dance became a kinesthetically crystallized whole, etched in kinesthetic memory and articulated by way of kinesthetic memory. Were one to take Cunningham’s description as a transcendental clue to coordinated movement, one might say that if one “wears movement long enough,” it can become a kinetic dynamic that spins continuously out of one’s body like the web of a web-spinning spider.

Beginning with extraordinary rather than diminished kinetic capacities means beginning with “the thing itself” and gaining direct knowledge about the inherent dynamics of movement.¹⁴ While in one sense extraordinary movement is at the other extreme of pathological movement, the idea of a linking continuum is methodologically misleading, for precisely by beginning with the extraordinary, one begins with the neurological and experiential reality of a kinetic melody and a kinetic harmonics, and goes from there to foundational dynamic understandings. A methodological focus on the extraordinary has the power to bring these dynamic understandings to light because it magnifies rather than constricts subtleties and complexities inherent in kinesthetic experience and kinesthetic memory.

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¹⁴ Such knowledge depends on a qualified observer. If cognitive science is to make use of experiential reports, it should insure that reportees are trained if not in phenomenological methodology, then in “auto-sensory observation” (Jacobson 1967, 1970). IW’s report of “a «crude» sense of effort” (Gallagher and Cole 1998, p. 137) is tantalizing in this respect. What is this “crude” sense?

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